

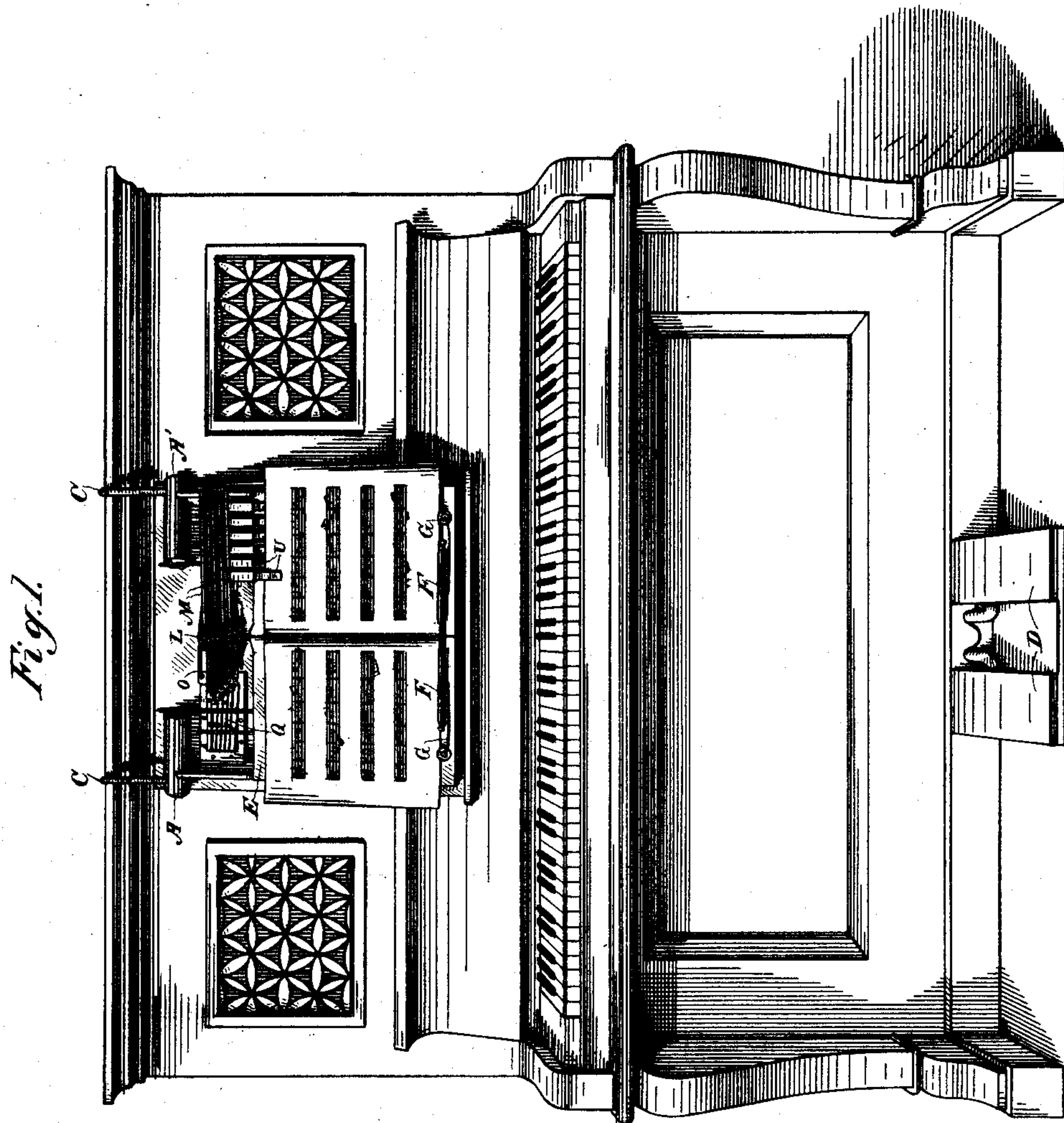
(No Model.)

3 Sheets—Sheet 1.

D. SCHUYLER.
MUSIC LEAF TURNER.

No. 430,302.

Patented June 17, 1890.



Witnesses,
Geo. H. Strong
J. H. Strong

Inventor,
Daniel Schuyler
By Dewey & Co.
attos

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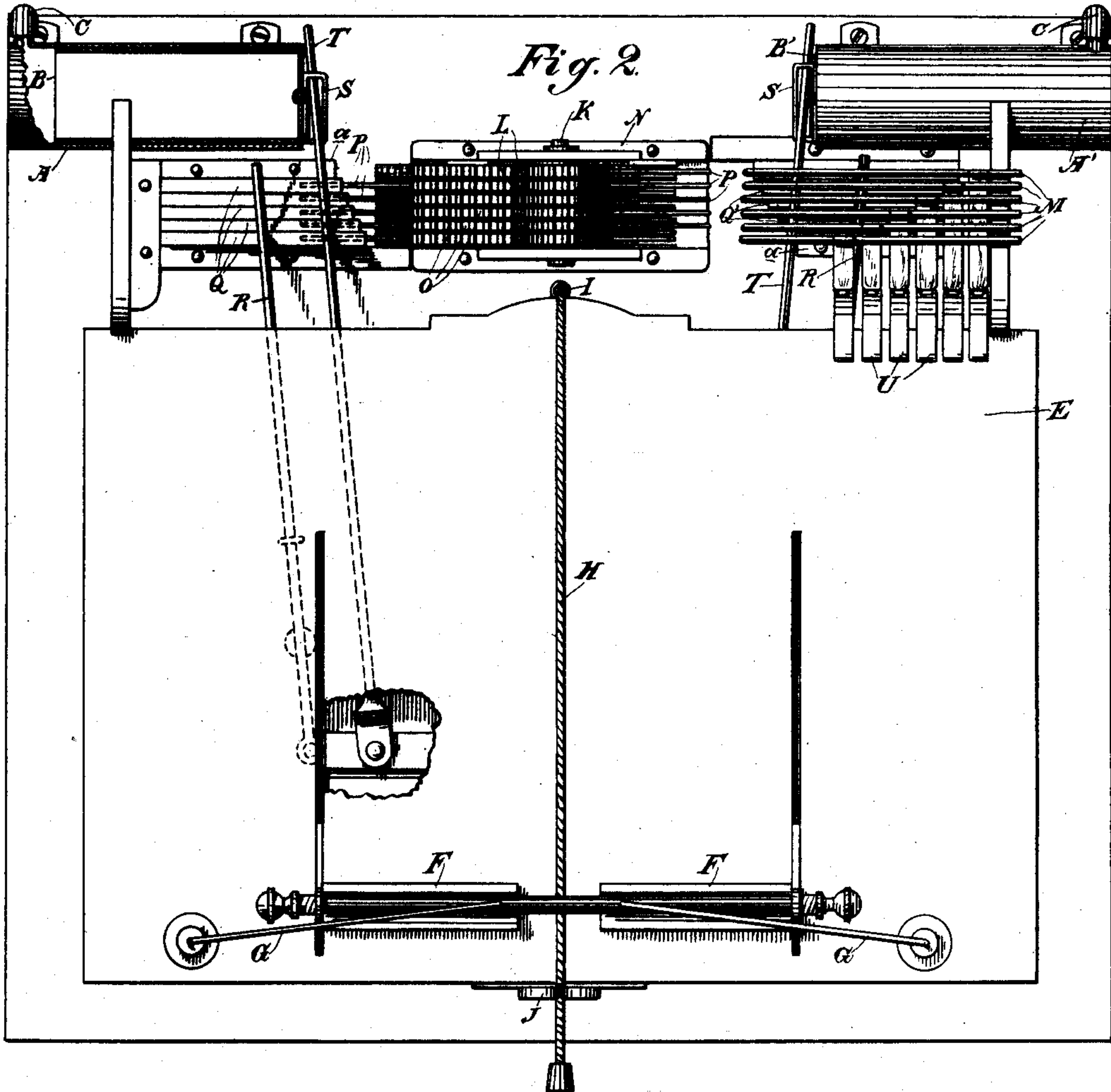
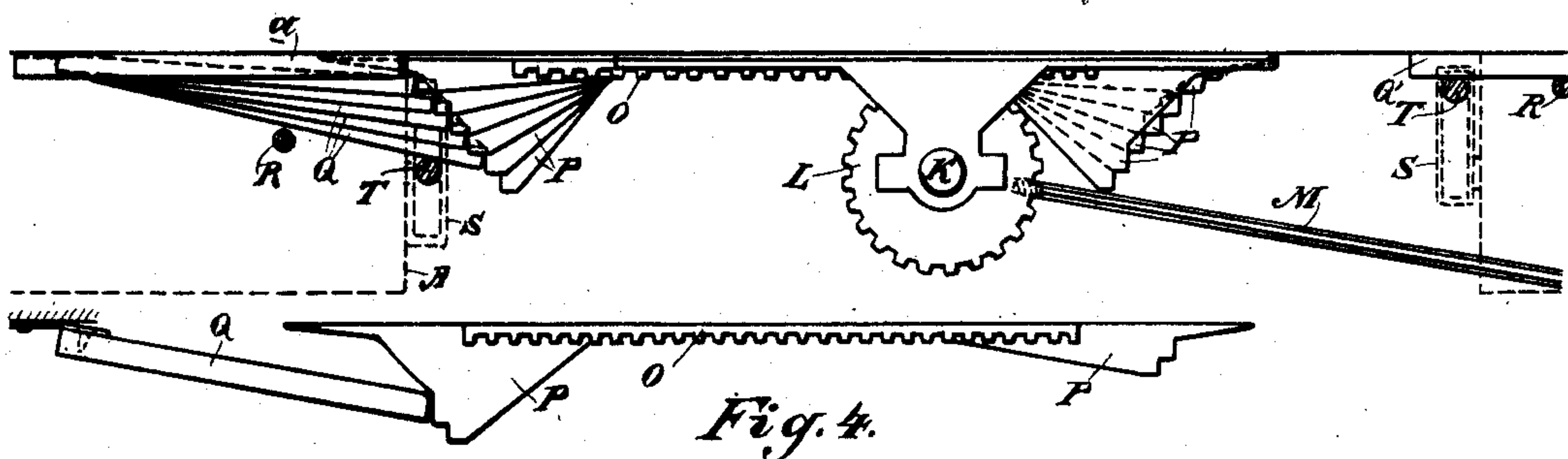


Fig. 3.



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3 Sheets—Sheet 3.

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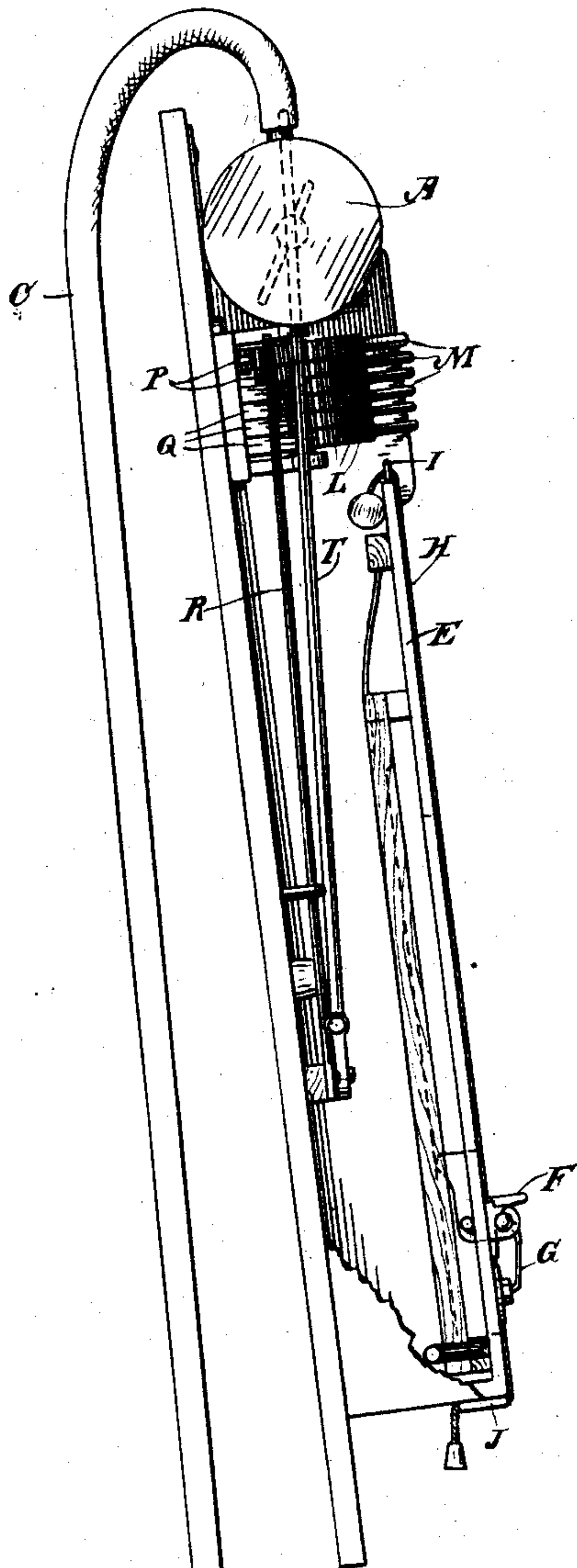


Fig. 5.

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UNITED STATES PATENT OFFICE.

DANIEL SCHUYLER, OF SAN DIEGO, CALIFORNIA.

MUSIC-LEAF TURNER.

SPECIFICATION forming part of Letters Patent No. 430,302, dated June 17, 1890.

Application filed January 18, 1890. Serial No. 337,347. (No model.)

To all whom it may concern:

Be it known that I, DANIEL SCHUYLER, a citizen of the United States, residing at San Diego, San Diego county, State of California, have invented an Improvement in Music-Leaf Turners; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus for turning leaves, and it is especially adapted for turning the leaves of music.

It consists of expansible air-chambers, a series of arms with attachments for grasping the leaves, and mechanism intermediate between the air-chambers and the arms, whereby the latter may be turned either backward or forward without aid from the hands.

It also consists in certain details of construction, all of which will be more fully explained by reference to the accompanying drawings and specification.

In the drawings, Figure 1 is a front view of my apparatus attached to a piano. Fig. 2 is a front elevation of the same. Fig. 3 is a top view of the turning mechanism. Fig. 4 is a detached plan view of the second lowermost rack-bar. Fig. 5 is a side view of my apparatus.

In carrying out my invention I have shown the pneumatic cylinders A and A' fixed upon a suitable support and having plungers B and B' fitted to travel within them, these plungers being sufficiently close to prevent any great amount of air escaping, but at the same time moving with sufficient freedom, so that when air is forced into either of the cylinders it will surround the plungers and to a certain extent form an air-cushion or packing upon which they move.

C C are pipes connecting with the rear end of each cylinder and conveying air thereto from the supply source.

When the apparatus is used in connection with an organ or other similar wind-instrument, it will only be necessary to open a valve connecting with the bellows or wind-chest of the wind-instrument, and a supply of air will be furnished to either of the cylinders at will. The valves in such cases may be operated by pedals convenient to the feet or by any other

suitable device. When used in connection with a piano or a music-stand for violin or other instrument, it will be necessary to employ a bellows or wind or air forcing device D to produce the necessary pressure. Various devices may be employed for this purpose. In the present case I have shown two air-forcing bellows, which, when employed for a piano, are fixed near to the ordinary pedals, so that by slightly turning the foot to one side or the other the operator may press upon either of the bellows, and thus force air through the air-pipe to either one cylinder or the other.

In some cases it may be found preferable to employ cylinders with plungers, which are connected with suitable pedals convenient to the feet by connecting-rods; but the modifications of this portion of the mechanism may be made to suit the taste or convenience of the manufacturer. I have shown the two cylinders A in the present case as lying horizontally and opposite to each other, so that one cylinder may be employed to turn the leaves in one direction and the other in the opposite direction, which is an important feature of my invention.

The music is placed upon a suitable supporting board or rack E, having at the lower end a support F, upon which the lower edges of the sheets rest, and to this support are attached the elastic arms G, with buttons at the outer ends, which are allowed to press upon the first and last leaves of the music, so as to hold them permanently in place. The support F is adapted to slide up or down upon the face of the rack E, and thus adapt itself to different lengths of sheets or leaves to be held upon it. The adjustment of F may be made in various ways—by a slot or slots in which it travels and a holding-screw, or, as I have shown in the present case, by means of elastic springs, which retain it by pressure at any point to which it may be moved.

Through the center of the music extends a cord H, having a weight at one end, this weight hanging behind the support upon which the music lies and being sufficient to produce a little tension upon the cord, so as to draw the cord up out of the way when re-

leased. The cord passes through a guiding eye or hole I at the top of the support, and thence passes down through the central portion or fold of the music, and the lower end is pressed between the clamps J at the bottom. When this is done, the weight will be drawn up against the eye, so that a sufficient tension may be brought upon the cord to bind the music to the support and hold it in place whether the sheets be long or short. The rest F is grooved or channeled to allow the cord to lie close upon the music.

In line above the central fold of the music is journaled a shaft K, which carries the independent toothed gears L, and each of these gears has an arm M, projecting radially outward. As many of these gears and arms may be mounted upon the shaft as will be necessary to turn any number of leaves of music, the number of gears and arms being as great as the number of leaves which will ordinarily be found in a piece of music. Beneath these gear-wheels is fixed a guide-plate N, having independent channels, within which are fitted the horizontal racks O, which slide in these channels, and the teeth of which engage with the toothed disks or gears, each rack engaging with one of the gears and all of them operating independently of each other.

Upon the opposite ends of the racks are fixed the notched inclined plates P, of different heights, and in line with each of these plates and racks are hinged the bars Q and Q', there being one of these bars at each end of the travel of each of the rack-bars, except the upper one at the left and the lower one at the right side. Elastic arms R are fixed upon the supporting-frame of the device, and these arms press upon the bars Q and Q' with a light pressure, so as to hold them down.

Each of the plungers B, which are fitted to reciprocate in the cylinders A, has a swivel-yoke S fixed in the center of its outer end, and the arms or rods T have their upper ends passing loosely into these swivel-yokes, while their lower ends are loosely hinged or attached near the bottom of the supporting-frame, so that when this frame stands at the usual inclination of a music rack or support the weight of these rods will cause them to drop toward the back of the support, and thus they will rise and fall upon the hinged bars Q and Q', always resting upon the highest one when not traveling back or forward. The inclined plates P are made, as shown in Fig. 3, with a gradual inclination toward the teeth of the racks to which they are attached or of which they form a part, then with an abrupt shoulder upon the top, this shoulder facing in the direction of the bars Q, and in such a manner that when either of the plungers is forced out, carrying with it the movable arm T, the arm T will engage the shoulder of the plate which stands the highest, and will thus force the plate and the rack-bar toward the opposite side, and through the rack-bar will

turn the toothed gear or disk L, thus causing the arm which is attached to the gear to travel over in the arc of a circle.

Each arm M has a clamp U flexibly connected with it, and the clamps are adapted to take hold of the upper edges of the leaves of music, so that when one of the arms is caused to traverse its arc of a circle it carries with it its clamp and the music-leaf to which said clamp is attached. These clamps are adapted to slide along the arms M, so as to stand at any desired point between the inner and the outer ends, and their positions are thus adjusted to adapt them to wide or narrow leaves.

Each of the plates P has its outer end inclined or beveled also and running down to a point, and each succeeding plate from the lowermost to the uppermost at the right end and from the uppermost to the lowermost at the left end is made a little higher than the one preceding, as is plainly shown in Fig. 3. The object of this difference in height and also in the corresponding difference in the inclined outer ends of the plates is to raise each succeeding bar Q slightly above the preceding one and to thus raise correspondingly the arms T.

To illustrate the operation, the piece of music being suitably fixed upon this rack or support and opened so as to expose the first two pages, if, as in the present case, there are six leaves to be turned, there will be six arms M, with clamps U connecting them with the successive leaves to be turned, and each arm will be fixed to a toothed disk or gear L, and each gear will engage with the corresponding horizontally-sliding rack O, as before described. All of the turning-arms will lie upon the right side, and consequently all of the racks O will be forced to the left side, and, the inclined outer points of the plates P, extending under the hinged bars Q, each one of the bars will be slightly raised above the preceding one by reason of the different heights of the incline. There are but five of the bars Q, the upper rack on the left side standing in line with the frame-piece *a* above the uppermost bar, and the corresponding lower rack at the right end standing in line with the frame below the lowest of the bars Q' upon that side. The uppermost of the bars Q is raised slightly above the level of the upper frame-piece *a* by the inclined point of its corresponding plate P, so that the notch upon this plate is slightly above the notch of the upper plate P. The second bar is raised slightly above the first one. The third, fourth, and fifth, correspondingly, are raised slightly above the preceding ones by the increased height of the inclined outer points of the plates P, which pass beneath them, so that when the leaves are in the position described and the rack-bars are all upon the left side the lowermost of the bars Q will stand the highest from the surface behind it. The rod T upon that side then rests upon the highest

point of the lower bar Q, and in such a position that when the plunger B upon that side is forced out by a supply of air admitted into the cylinder A the side of the rod T will engage the shoulder of the lowermost plate P, which is in line with the lower bar Q, and, pushing the rack-bar to the right, the rack-bar will, through its engagement with the gear, turn the latter and the arm carried by the latter, and with it the leaf of music to be turned. As soon as the pressure is released within the cylinder A the air may be withdrawn by the action of a spring within the bellows or by other suitable device, and the plunger B will be withdrawn to the rear end of the cylinder A, carrying with it the rod T. This rod passes up over the incline of the plate P upon the second rack-bar from the bottom and drops upon the second of the bars Q in readiness to engage the shoulder or notch upon its plate P, when the piston is again pushed forward, and thus upon each successive return of the plunger the rod T drops upon the next one of the bars Q, each preceding one having dropped into a horizontal position as soon as its corresponding rack-bar has been moved to the right, so as to withdraw the inclined plate P from beneath it. In this way the rod T drops at each successive return on the bar *a*, which is next above, until the uppermost rack-bar has been moved and all the pages have been turned. It will be manifest that any leaf may be turned backward by operating the bellows connected with the cylinder and plunger upon the opposite side, so that, if desired, any of the leaves may be turned backward with equal facility. It will be seen that the relative height of the plates P and the bars Q' at the right side are the reverse of those at the left—that is, the uppermost plates and bars are highest upon this side. The swivel-yokes, which are attached to each of the plunger ends, and within which the rods T are loosely fitted, allow these rods to rise and fall without any friction, and thus accommodate themselves to the different positions which they take upon the bars Q. These swivels also allow the plungers to rotate freely within the cylinders as they reciprocate, and thus distributing any possible wear equally.

It will be seen that the movements of all the parts necessary to turn the leaves are positive; and I do not in any way rely upon springs or similar devices for moving the leaves. Each leaf is turned either to right or left by simply pressing the foot upon the bellows or air-supply mechanism, and when the leaf has thus been turned the rack and mechanism by which the turning is accomplished remain in the positions in which they are left after this turning and are in readiness to be turned in the opposite direction whenever the opposite movement takes place. The spring-arms R, which rest upon the bars Q, simply insure each bar dropping below the level of the next succeeding one as soon as

the rack-bar in line with it has been withdrawn.

In some cases an entire piece of music is contained in one sheet, being printed upon both sides. Such a sheet may be held and turned by my device by simply folding the left-hand margin so that the retaining-cord will lie in the fold. The sheet may then be attached to one of the clamps and turned in the usual manner.

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

1. A device for turning leaves, consisting of the pivoted arms M, connected successively with the leaves to be turned, racks and pinions by which said arms are turned about their center of motion, and pneumatic expandible chambers through which motion is transmitted to move the racks and pinions and turning-arms successively, substantially as herein described.

2. The turning-arms M, connected with the leaves and having a central shaft about which they move, pinions connected with the inner ends of said arms, rack-bars engaging the pinions, a pneumatic expandible chamber, and an intermediate connecting mechanism whereby the movement of expansion within the chambers is transmitted to each of the rack-bars and pinions successively, substantially as herein described.

3. A series of turning-arms and pinions journaled to move independently, sliding rack-bars engaging each of the pinions and having upon their ends the inclined plates P, with notches or shoulders, in combination with the pneumatic expansion-chambers and the rods T moved thereby, so as to engage the notched plates and reciprocate the rack-bar, substantially as herein described.

4. The turning-arms, pinions, and reciprocating racks by which they are actuated, the inclined notched plates fixed to the opposite ends of each of the racks, the pneumatic expansion-chambers, and the rods T actuated thereby, in combination with the hinged bars Q, in line with the rack-bars, said bars having their free ends raised successively one above the other by the inclined plates upon the rack-bars, substantially as herein described.

5. The hinged bars Q, the rack-bars by which the pinions and turning-arms are actuated, and the inclined or beveled plates fixed to the ends of the rack-bars and increasing in height from one side to the other, said plates engaging the bars Q and raising them successively one above another, in combination with the expansion-chambers and the rods T actuated thereby and resting upon the bars Q, said bars acting as guides to cause the rod T to engage the notches or shoulders in the plates P successively with each reciprocation of the piston, substantially as herein described.

6. The turning-arms and pinions, the inde-

pendently-actuated rack-bars engaging said pinions and having the inclined plates at their opposite ends, in combination with the hinged bars Q and Q', the spring-arms pressing upon
 5 said bars, the swinging arms T, the pneumatic cylinders and plungers, and the swivelled yokes fixed in the ends of the plungers and engaging the arms T, so as to reciprocate the arms with the movement of each of the
 10 plungers, substantially as herein described.

7. The combination, with the pneumatic cylinders, plungers, swinging arms, sliding toothed racks, pinions, and turning-arms, of the flexible straps adjustable upon said arms
 15 and having the clamps whereby they are connected with the upper edges of each of the leaves to be turned successively, substantially as herein described.

8. In combination with a leaf-turning mechanism, as shown, a supporting-rack for the music, having the bottom plate made adjustable up and down to suit the sizes of the leaves, the weighted cord adapted to rest across the central fold of the leaves, and the
 25 clamp whereby the lower end of the cord is held in place, substantially as herein described.

9. The combination, with the leaf-turning device, as shown, of the music-supporting rack,
 30 the vertically-adjustable support for the lower edge of the music, the weighted cord fitting the central fold of the sheets, the clamping device by which the lower end of the cord is held, and the elastic arms movable with the
 35 rest and having the pads or clamps at the outer ends, by which the first and last leaves are held in place, substantially as herein described.

10. The combination, with a music-turner, of the supporting-rack having the vertically-
 40 adjustable bottom support or rest for the pages, and the holding-clamps movable therewith, the pneumatically-actuated turning-arms having the clamps connected therewith to attach to the upper edges of the sheets of
 45 music, said clamps being adjustable toward or from the center of motion of the turning-arms to adjust them to varying sizes of music, substantially as herein described.

11. The music-support having a guide at
 50 the top, a cord passing through said guide and having a weight attached to its rear end, so as to be drawn up against the guide, and an automatic clamp at the bottom of the support into which the cord may be fixed and
 55 held, substantially as herein described.

12. In combination with a leaf-turning mechanism, as shown, a supporting-rack upon which the music lies, a cord extending up through the central fold of the leaves, and a
 60 guide at the top and having a weight suspended from it behind the rack, a clamp by which the lower end of the cord is held in place, and a plate or rest for the lower edge of the music, said rest having a slot or chan-
 65 nel in the center to allow the cord to bind the music closely upon the rack, substantially as herein described.

In witness whereof I have hereunto set my hand.

DANIEL SCHUYLER.

Witnesses:

S. H. NOURSE,
 H. C. LEE.