(No Model.) 3 Sheets—Sheet 1.

C. H. HUFF.

MUSIC LEAF TURNER.

No. 475,317. Patented May 24, 1892.

Fig. 1.

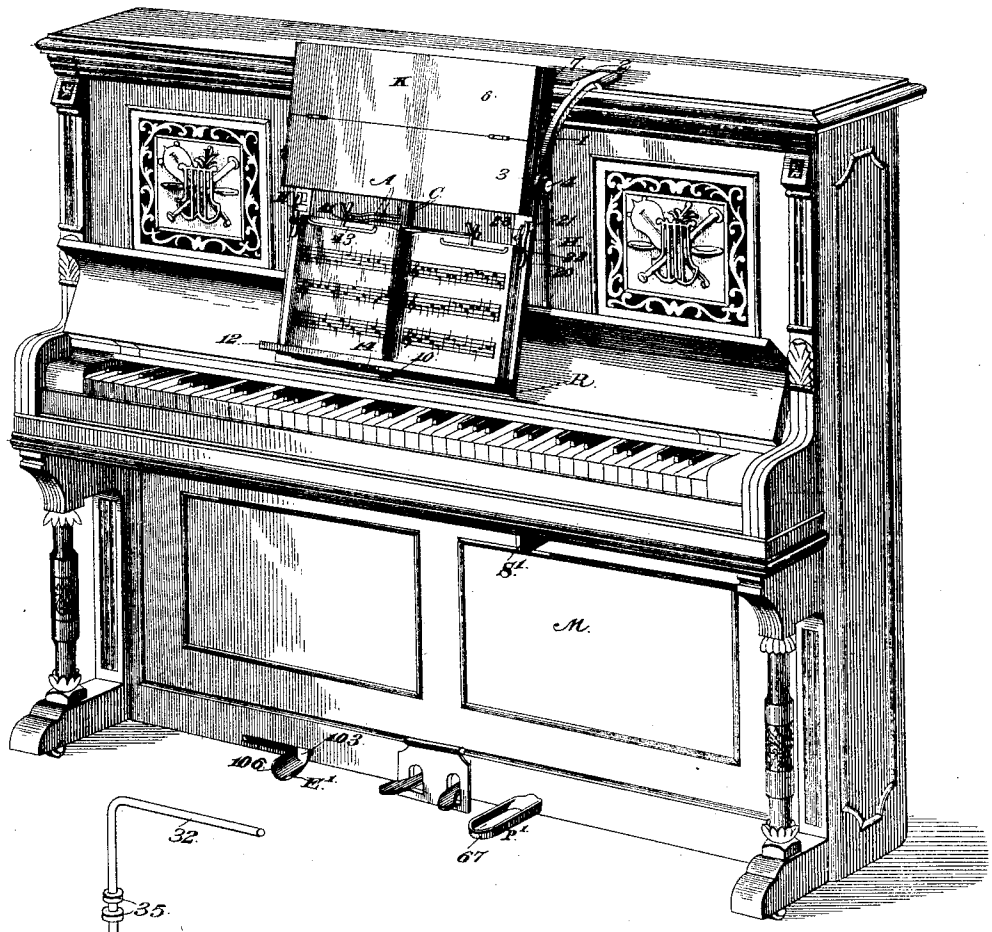


Fig. 9.

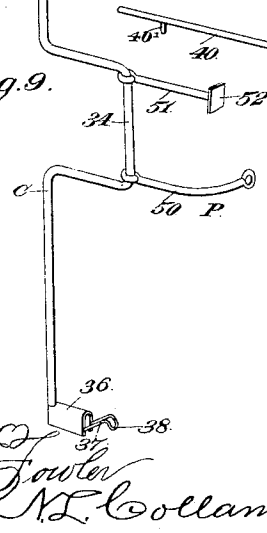
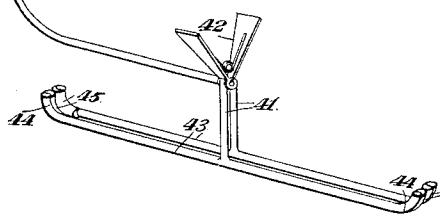


Fig. 10.



Witnesses

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

C. H. HUFF.

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Fig. 2.

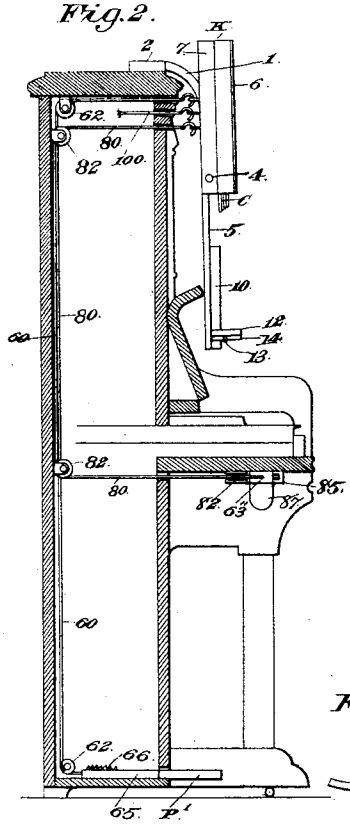

Fig. 3.

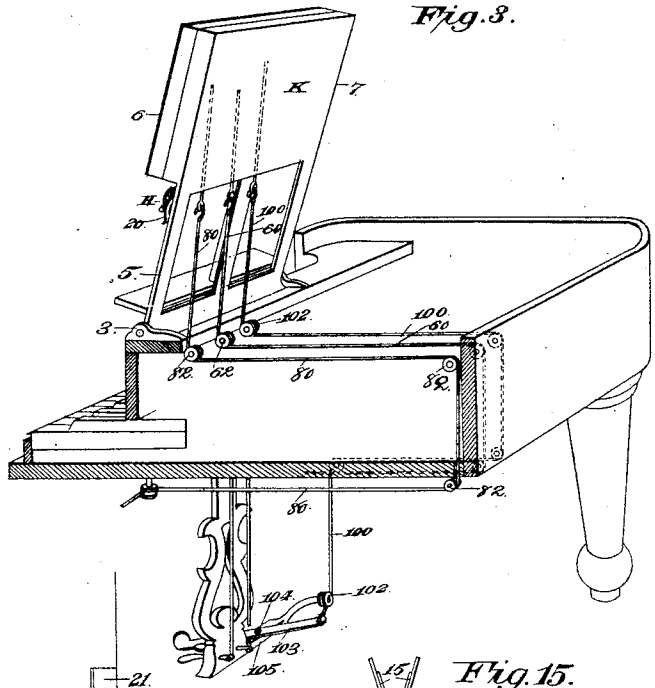

Fig. 14.

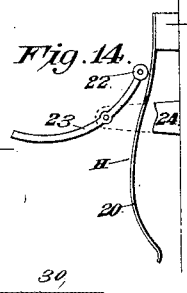

Fig. 15.

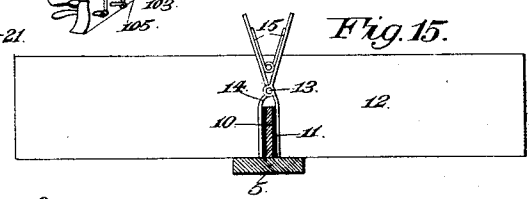

Fig. 11.

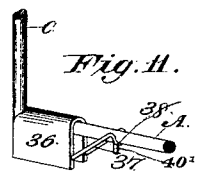

Fig. 12.

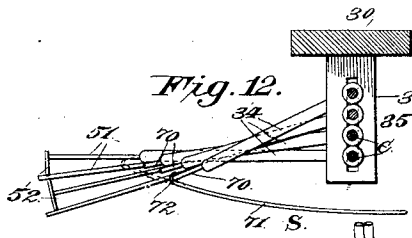

Fig. 13.

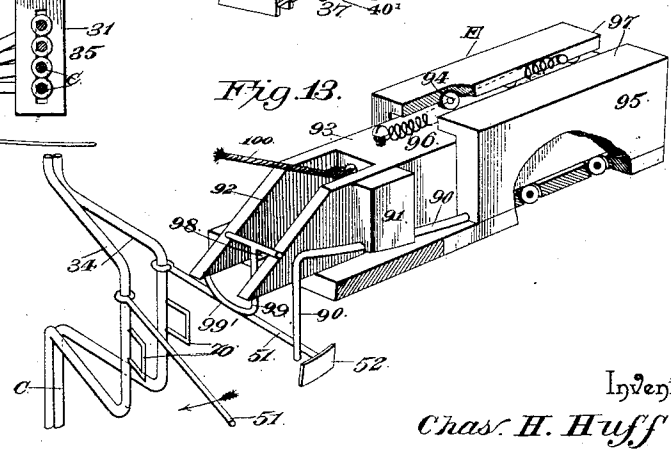

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Fig 4.

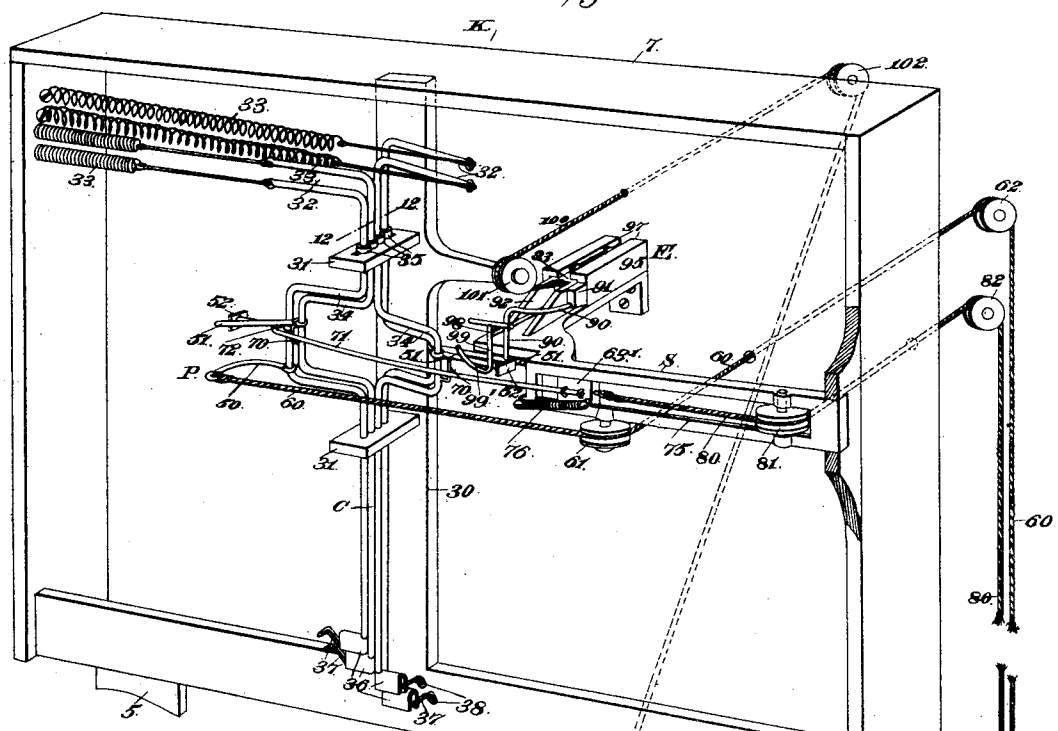


Fig. 5.

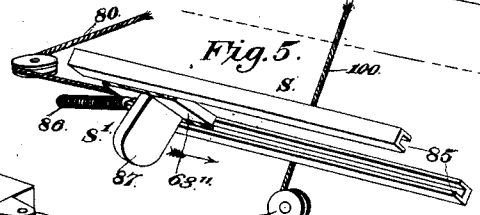


Fig. 8.

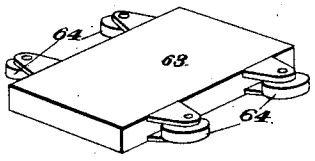


Fig. 7

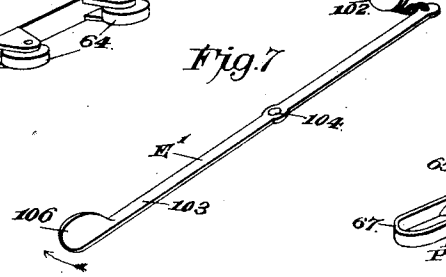
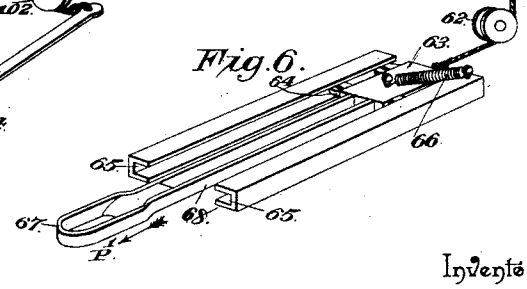


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES H. HUFF, OF TROPICO, CALIFORNIA.

MUSIC-LEAF TURNER.

SPECIFICATION forming part of Letters Patent No. 475,317, dated May 24, 1892.

Application filed August 15, 1891. Serial No. 402,732. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. HUFF, a citizen of the United States, residing at Tropico, in the county of Los Angeles and State of California, have invented a new and useful Music-Leaf Turner, of which the following is a specification.

This invention relates to music, and more especially to the devices known as "leaf-turners," which are adapted to be mounted on pianos or organs to turn the leaves of a book or the sheets of a piece of music when desired to either the right or left singly or to the right collectively without necessitating the withdrawal of the player's hands from the keyboard; and the object is to produce certain improvements in devices of this character.

To this end the invention consists in the construction hereinafter more fully described and claimed, and as illustrated on the three sheets of drawings, wherein—

Figure 1 is a general perspective view of an upright piano with my improved attachment applied thereto. Fig. 2 is a vertical cross-section of the piano, showing the manner in which the cords pass around inside the casing thereof. Fig. 3 is a perspective view of one-half of a square piano, showing the arrangement of parts when my attachment is used in connection with a piano of this character. Fig. 4 is an enlarged perspective view of the turner proper with the front half of its casing removed and showing the cords in diagram as leading therefrom, respectively, to Fig. 5, which shows the knee-shift for operating the strain-repeating devices, Fig. 6, which shows the heel-socket for operating the piece-repeating mechanism, and Fig. 7, which shows the foot-lever for operating the escapement mechanism. Fig. 8 is an enlarged perspective detail showing the anti-friction wheels at the corners of one of the sliding blocks. Fig. 9 is an enlarged perspective detail of one of the cranked rods. Fig. 10 is a similar detail of one of the sheet-turning arms. Fig. 11 is a similar detail of the connection between these two members. Fig. 12 is a horizontal section on the line 12 12 of Fig. 4, showing the operation of the strain-repeating mechanism. Fig. 13 is an enlarged perspective detail, partly broken away, of the escapement devices, showing two of the cranked rods in connection therewith. Fig. 14 is an enlarged side elevation of one of the holders for clamping the covers of a music-book. Fig. 15 is a bottom plan view of the devices for adjusting the foot of the music-rack.

Referring to the said drawings, the letter M designates the musical instrument—such as an organ or an upright or square piano—to which my improved leaf-turner is applied. The turner proper is located within a casing K, adjustably and removably mounted on the body of the musical instrument above the music-rack R, and the covers of a music-book or the first and last sheets of a piece of music are held open by holders H. Within the casing are journaled vertical cranked rods C, each of which carries at its lower end a horizontally-projecting arm A for turning the leaf or sheet of music, these cranked rods being oscillated in one direction by spring mechanism. The said rods may be turned in the other direction one at a time by a strain-repeating mechanism S, which is connected with and operated by a knee-shift S′, located beneath the keyboard, or they may be turned in that direction collectively by piece-repeating mechanism P, which is connected with and operated by a heel-socket P′, located near the pedals of an upright piano, or another knee-shift similar to the one shown in Fig. 5, but located beneath the keyboard of a square piano in position to be operated by the other knee, and said rods are held against movements by their springs by an escapement E, which is connected with and operated by a foot-lever E′, located adjacent the pedals, all these parts being of the construction and relative arrangement more fully described below and illustrated in the several figures of the drawings. The casing K is supported in front of an upright piano by arms 1, removably seated at their upper ends between cleats 2 on the piano, and their lower ends having eyes 3, engaging pins 4 in the sides of the casing, and on a square piano the pins 4 are at the lower end of the music-rack 5 and engage eyes 3, rising from the top of the piano. The casing is composed of a pair of box-shaped members 6 and 7, from the latter of which depends the rack 5, and within this casing the

mechanism of the turner proper is located. The outer box-shaped member 6 has a hinged section or door to permit access to the interior of the casing.

In order that the rack may be adapted to sheets or books of different vertical heights, I provide the central vertical bar of said rack with a forwardly-projecting slat 10, coated on each face with rubber 11, and to the bottom of the foot-piece 12 of the rack I pivot at 13 a clip 14, whose projecting thumb-pieces are normally distended by a spring 15, so as to cause its jaws to bite the rubber-faced slat. By this device the foot of the rack can be raised and lowered when desired.

When a music-book is placed on the rack, or even when a sheet of music rests thereon, I employ the holders H for keeping the book open by holding its covers on the rack or preventing the first and last sheets of the piece of music from being turned over when the other leaves or sheets are turned by my improved turner. This holder comprises a spring 20, secured at its upper end to a block 21, projecting forwardly from one of the side bars of the rack 5, and which spring is adapted to be clamped with its free end on the book-cover by a roller 22, mounted in one end of a lever 23, which is pivoted in a lug 24, projecting from the rack, the pivot being at such point that when the lever is turned around it the roller travels down the spring and throws the free end of the latter forcibly against the book-cover.

In the rear half 7 of the casing K is located a vertical bar 30, having forwardly-projecting blocks 31, and in these blocks is pivoted a number of cranked rods C. Each rod stands approximately vertical, its upper end 32 being bent laterally and connected by a contractile spring 33 with the left end of the box 7, while the crank 34 in the body of the rod stands between the two blocks 31. The rod is provided with sleeves 35 above and below the upper block, Fig. 9, which prevents its vertical movement through the blocks. At the lower end of the rod is preferably located a laterally-projecting curved plate 36 of inverted-**U** shape, and from the outer end of this plate projects a bent rod 37, having a **U**-shaped depression 38 at its outer end; but in in Fig. 1 these plates 36 are omitted.

In Fig. 10 is shown one of the arms A, which holds the music-leaves that are to be turned over. The body 40 of this arm is adapted to be passed into the depression 38 of the rod 37, and then under the curved plate 36 at the lower end of one of the cranked rods C, by which means the arm will be caused to project horizontally from the lower end of the cranked rod, which supports it, and the stud 40′ on the arm 40 engages behind the depression 38 to prevent the arm being thrown out by centrifugal force.

Pivoted on the outer extremity of the body 40 is a pair of levers 41, whose thumb-pieces are held normally distended by a spring 42, and connected to the lower ends of these levers are horizontal rods 43, having turned-up ends 44 and preferably coated with rubber 45 on their meeting faces. The cranked rods C extend downwardly beneath the lower end of the casing K, as seen in Fig. 1, and the arms A have their horizontal rods clipped on the upper edges of the leaves or sheets. It will be understood that the upper ends 32, the cranks 34, and the curved plates 36 of the cranked rods, as well as the bodies 40 and the clips of the arms, are so arranged, as shown in the drawings, that they will not interfere with the motions and operation of the similar parts of other members.

The springs 33, it will be seen, normally turn the pages to the left, and in order to turn them all to the right, as at the beginning of a piece of music, I make use of the piece of mechanism or piece-repeating mechanism P, which consists simply of an arm 50, projecting from the crank 34 of the last rod C to the left, fingers 51 on the cranks and projecting therefrom in line therewith, and plates 52, near the outer ends of alternate fingers, together with means for drawing said arm to the right, whereby the several plates and fingers standing in contact cause the various cranked rods to be turned. From the arm 50 leads a cord 60, passing over a grooved pulley 61 in the casing K and over others 62 in the body of the musical instrument M until it connects with the heel-socket P′. (Best seen in Fig. 6.) This socket comprises a sliding block 63, having at its corners anti-friction wheels 64, which move in guides 65, carried by the musical instrument, the block being drawn normally to the rear by a spring 66; but when it is desired to impart a pull to the cord 60, as when the entire piece of music is to be repeated, the operator presses his heel in a socket 67 at the front end of a bar 68, which projects forwardly from the block 63 and draws the whole device outward. In the case of a square piano, where it is not convenient to have the guides 65 near the operator's foot, I may lead the cord 60 beneath the keyboard, as shown in Fig. 3, and operate the piece-repeating mechanism by a knee-shift substantially like the one described hereinafter, although I prefer, where it is possible, to employ the heel-socket just described.

It often occurs that a certain strain in a piece is to be repeated, and as this strain may extend over a page it becomes necessary, in order to repeat it, to turn back one page, and this operation I effect by the strain-repeating mechanism. (Best seen in Figs. 4 and 12.) Each of the cranks 34 has projecting outwardly therefrom a loop 70, the several loops varying in length, as seen, and 71 is a spring having its free end 72 hooked and of such length that it will engage the loop of only the last crank which has passed over to the left. The other end of this spring is secured to a block 63′, which moves in guides 75 and is borne normally to the left by a spring 76, and

the block 63′ may correspond with that shown in Fig. 8 and already described—that is to say, it may have friction-wheels at its corners engaging the guides 75.

From the block 63′ leads a cord 80, passing over a grooved pulley 81 at the right extremity of the guides 75 and over other pulleys 82 in the body of the musical instrument until it connects with the knee-shift S′. (Best seen in Fig. 5.) This knee-shift comprises a sliding block 63″, which may have anti-friction wheels at its corners, the same as the block 63, and which moves in guides 85, toward whose left end it is normally drawn by a spring 86. From the block 63″ depends a plate 87, which is adapted to be struck by the right knee, and when a strain is to be repeated the last page can be turned back (that is to the right) by moving this plate to the right by the right knee, this movement of the knee-shift drawing on the cord 80 and operating the strain-repeating mechanism S in the manner above described. When the piece-repeating mechanism is to be operated by a knee-shaft instead of by the heel-socket, as above described, such additional knee-shift will be placed under the keyboard in position to be struck by the left knee and moved outwardly, its spring, of course, drawing it in the opposite direction, and that knee-shift will preferably be the counterpart of this, and hence needs no further description or illustration.

It will be obvious that when one or more of the cranked rods C are drawn to the right against the tension of their springs some mechanism must be provided which will hold these rods and which will be capable of releasing them one by one at proper moments when it is desired to turn over a page. Such mechanism I call the "escapement" E, which is best seen in Fig. 13. The said escapement consists of a block 93, preferably having a forked and beveled front end 92 and a laterally-projecting lug 91, the said block sliding in guides 95, which may have anti-friction rollers 94 and inturned lips 97 on their upper sides, and the block is normally drawn to the rear by a spring 96.

90 is a spring-arm, of L shape, whose inner end is secured to one of the guides and whose downturned outer end is adapted to engage one of the fingers 51, projecting from the crank 34, when the block 93 is moved forward, so that the lug 91 depresses this spring-arm. 98 is another spring-arm secured at its rear end to one of the guides 95 and its front end having a vertical T-shaped head 99, whose lateral arms are adapted to be engaged by the beveled upper edges of the fork 92, so that when the block is moved forward this head is raised and will pass over the finger 51, while the head of the other arm 90 is descending and engaging the finger next in the rear. By this means a finger can be released and allowed to fly around with the crank 34, as seen in Fig. 13, and when the power which produces the forward movement of the block is relaxed and the block moves to the rear under the force of the spring 96 the arm 90 ascends and the spring-arm 98 descends, whereby the arm 90 releases the fingers and they are held behind the vertical portion of the head 99 of the arm 98, the front finger bearing against said portion and the plates 52 of those in rear bearing, respectively, against the fingers next in front. When a new forward impulse is imparted to the block, the operation will be repeated. The lower end of the T-head 99 has a forwardly-projecting and upwardly-inclined guide 99′, and when one or several of the cranks are drawn back, as by the strain or piece repeating mechanisms above described, the finger or fingers 51 pass under this guide and are successively engaged by the head 99, which acts like a spring-actuated pawl. Hence this escapement not only permits the successive release of the fingers, as desired, but also receives and engages as many of said fingers as may be drawn back when portions of the music are to be repeated.

From the block 93 leads a cord 100, passing over a grooved pulley 101 in the casing and then over other pulleys 102 in the body of the musical instrument until it connects with a foot-lever E′, (best seen in Fig. 7,) and which comprises the mechanism for operating the escapement E. The said foot-lever E′ consists of a plain straight body 103, pivoted at 104 inside the casing of an upright or to a lateral extension of the pedal-support of a square piano, as seen at 105 in Fig. 3, this extension when it is used carrying one of the pulleys 102. The front end of the body is enlarged or turned up, as at 106, to form a plate, against which the operator's left foot may be borne when it is desired to turn over a leaf. By the turning of this lever and the drawing on the cord 100 the escapement is operated in the manner above described.

I have shown my improved attachment with the cords led through the casing of a piano, and this is preferable; but in case such arrangement should involve too much expense, complication of mechanism, or injury to the instrument it is to be understood that the cords could be led around the exterior of the instrument to the proper points beneath. In fact, a very slight change, amounting merely to the adaptation of the parts of this device, would render it attachable to instruments now in use, and such changes I consider as coming within the scope of the invention.

It may be found desirable to provide other means for adjusting the foot of the rack for holding the covers of the book for operating each of the mechanisms described, or, in fact, to take the place of one or more of said mechanisms; but I desire it to be understood that the several parts of this invention may be used independently or in connection with other devices in so far as it is possible to do so, and considerable change in and elabora-

tion of the details may be made without departing from the principles involved.

What is to be claimed as new is—

1. In a leaf-turner, the combination, with the casing, the turning mechanism therein, and means for operating said mechanism, of a rack depending from said casing, a foot-piece vertically adjustable on said rack, pins in the sides of the casing, cleats on the piano, and arms detachably inserted between said cleats and having eyes pivotally embracing said pins, substantially as described.

2. In a leaf-turner, the combination, with the casing, the turning mechanism therein projecting below the lower end of the casing, sheet-holding arms carried by said mechanism, and means for operating the mechanism, of a rack depending from the casing below said arms, a vertically-adjustable foot-piece on said rack, pins in the sides of the casing, and eyes supported by the piano, with which said pins detachably engage, as and for the purpose set forth.

3. The herein-described rack, the same comprising a body, a foot-piece along the lower edge thereof, a block at each side of the body, a vertical spring projecting from said block, a lug adjacent the block, a lever pivoted to said lug, and a roller in the inner end of the lever adapted to be borne against the spring, as and for the purpose set forth.

4. In a leaf-turner, the combination, with the casing, the turning mechanism therein projecting below the lower end of the casing, sheet-holding arms carried by said mechanism, and means for operating the mechanism, of a rack depending from the casing, a foot-piece at the lower end of said rack, and holders mounted on the edges of the rack, each comprising a spring having one free end and a pivoted lever having a roller adapted to bear said free end against the sheet, as and for the purpose set forth.

5. In a leaf-turner, the combination, with the casing, the cranked rods therein, their lower ends projecting below the casing, laterally-projecting plates at said lower ends of inverted-U shape, bent rods projecting from the outer ends of said plates and having U-shaped depressions, and means for operating the cranked rods, of sheet-turning arms, substantially as described, whose inner ends are detachably engaged with the bent plates and the depressions in the rods, as set forth.

6. In a leaf-turner, the combination, with the casing having blocks therein, a number of cranked rods journaled in said blocks with their cranks between them, sleeves on each rod preventing its vertical displacement, and sheet-turning arms carried by the lower ends of said rods, the upper end of each rod being bent laterally, of contractile springs connecting said laterally-bent ends with the left side of the casing, an escapement in the casing to the right of said blocks, adapted to release the cranks of said rods one by one, and means for operating said escapement, substantially as described.

7. In a leaf-turner, the combination, with the casing, vertical rods journaled therein and having laterally-bent upper ends, and sheet-turning arms carried by the lower ends of said rods, of contractile springs connecting said laterally-bent ends with the left side of the casing, fingers projecting from said rods, an escapement in the casing to the right of the rods, adapted to release the fingers of the rods one by one, and means for operating said escapement, substantially as described.

8. In a leaf-turner, the combination, with the casing, upright rods journaled therein, sheet-turning arms carried by their lower ends, and springs normally throwing said arms to the left, of fingers projecting from said rods, a plate on every alternate finger for holding the fingers separated, an escapement in the casing to the right of the rods, having two heads alternately engaging said fingers, and means for operating said escapement, substantially as described.

9. In a leaf-turner, the combination, with the casing, upright rods journaled therein, sheet-turning arms carried by their lower ends, and springs normally throwing said arms to the left, of fingers projecting from said rods, a plate on every alternate finger for holding the fingers separated, an L-shaped arm having a spring-body and a depending front end, another spring-arm having a T-shaped head, these arms being secured in the casing to the right of the rods with their lower ends adapted to engage alternate fingers, and means, substantially as described, for moving said arms in opposite directions, as and for the purpose set forth.

10. In a leaf-turner, the combination, with the casing, an upright rod journaled therein, a sheet-turning arm carried by its lower end, a spring normally throwing said arm to the left, and a finger projecting from the rod approximately parallel with the arm, of a spring-arm projecting from the casing at the right of said rod, a T-head at its front end whose vertical portion normally engages said finger, a block having a forked and rearwardly-inclined front end engaging the horizontal portion of said head, and means for operating said block, substantially as described.

11. In a leaf-turner, the combination, with the casing, upright rods journaled therein, sheet-turning arms carried by their lower ends, springs normally throwing said arms to the left, fingers projecting from said rods, and a plate on every alternate finger for normally holding the fingers separated, of a spring-arm projecting from the casing at the right of said rods, a T-head at its front end whose vertical portion normally engages one of the fingers, an upwardly-rising spring-arm also projecting from the casing and having a depending front end or head adjacent, slightly in rear of and its lower end standing

normally slightly above that of the T-head, a block having a forked and rearwardly-inclined front end engaging the horizontal portion of the T-head, a lug on said block engaging the upper side of said upwardly-rising spring-arm, and means for operating said block, as and for the purpose set forth.

12. In a leaf-turner, the combination, with the casing, the cranked rods journaled therein, the sheet-turning arms carried by the rods, and the fingers projecting from said rods, of an escapement adapted to release said fingers one by one, a foot-lever, an operating-cord connecting said lever with the escapement, and a spring in the escapement opposing the tension of said cord, substantially as described.

13. In a leaf-turner, the combination, with the casing, an upright rod journaled therein, a sheet-turning arm carried by its lower end, a spring normally throwing said arm to the left, and a finger projecting from the rod, of a spring-arm projecting from the casing, a T-head at its front end whose lower end normally engages said finger when the sheet-turning arm is moved to the right, an upwardly and forwardly inclined guide projecting from the lower end of said head, a block having a forked and rearwardly-inclined front end engaging the horizontal portion of said head, and means for operating said block, as and for the purpose set forth.

14. In a leaf-turner, the combination, with the casing, an upright rod journaled therein, a sheet-turning arm carried by its lower end, a spring normally throwing said arm to the left, a finger projecting from the rod, and means for turning said arm to the right when desired, of a spring-actuated escapement having an inclined guide at its front end and automatically engaging said finger when the arm is turned to the right, and means for tripping said escapement, as and for the purpose set forth.

15. In a leaf-turner, the combination, with the casing, upright rods journaled therein, sheet-turning arms carried by their lower ends, springs normally throwing said arms to the left, and an escapement, substantially as described, engaging the rods for holding the arms to the right and releasing them one by one when desired, of an arm projecting from the last rod of the series and standing parallel with its sheet-turning arm, a cord leading from said arm over a pulley in the casing at the right of the arms, and means for drawing on said cord, as and for the purpose set forth.

16. In a leaf-turner, the combination, with the oscillating rods, the sheet-turning arms carried thereby, springs normally throwing said arms in one direction, an escapement retaining them against the tension of said springs, and means for operating the escapement, of an arm projecting from the last rod of the series, a cord leading from said arm over pulleys, a block sliding in guides, to which block the cord is connected, and a heel-socket projecting from said block, substantially as described.

17. In a leaf-turner, the combination, with the casing, the cranked rods journaled therein, the sheet-turning arms carried by their lower ends, springs normally throwing said arms to the left, an escapement holding the arms to the right, and means for operating the escapement, of loops projecting from the cranks of said rods and of variable lengths, a spring having a hook at one end engaging the loop on the last rod which has been released by the escapement, and means for moving said spring bodily to the right, as and for the purpose set forth.

18. In a device of the character described, the combination, with the parallel guides, of a block between said guides and having anti-friction wheels at its corners engaging them, a spring connecting the block with one of the guides for drawing said block in one direction, and means for moving said block manually in the opposite direction, as and for the purpose set forth.

19. In a leaf-turner, the combination, with the spring-actuated cranked rods carrying the sheet-turning arms at their lower ends, of an escapement holding said arms to the right and adapted to release them one by one, means for returning the last one and other means for returning all of the arms which have been released, cords leading from the escapement and the returning devices to the exterior of the casing, and pedals independently connected to said cords, whereby the player may operate the turner without the use of his hands, all substantially as hereinbefore set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

CHARLES H. HUFF.

Witnesses:
WILL S. BRYSON,
J. M. CHILDRESS.