No. 874,221. PATENTED DEC. 17, 1907.

C. A. MATHENY.

MUSIC LEAF TURNER.

APPLICATION FILED OCT. 16, 1906.

3 SHEETS—SHEET 1.

Fig. 1

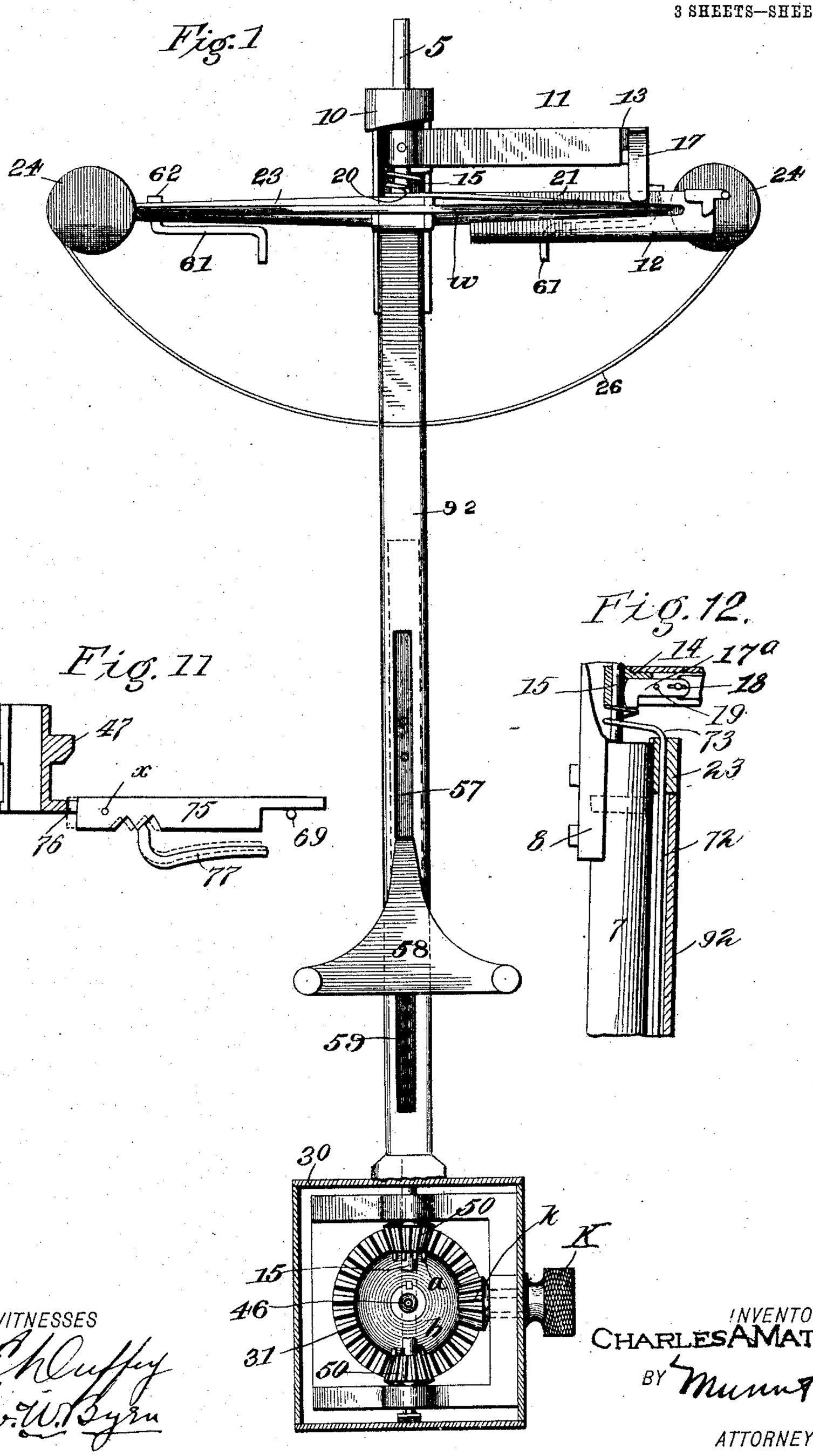


Fig. 11

Fig. 12.

WITNESSES

C. E. Chaffey

Edw. W. Byrn

INVENTOR

CHARLES A. MATHENY

BY Munn & Co.

ATTORNEYS

No. 874,221. PATENTED DEC. 17, 1907.

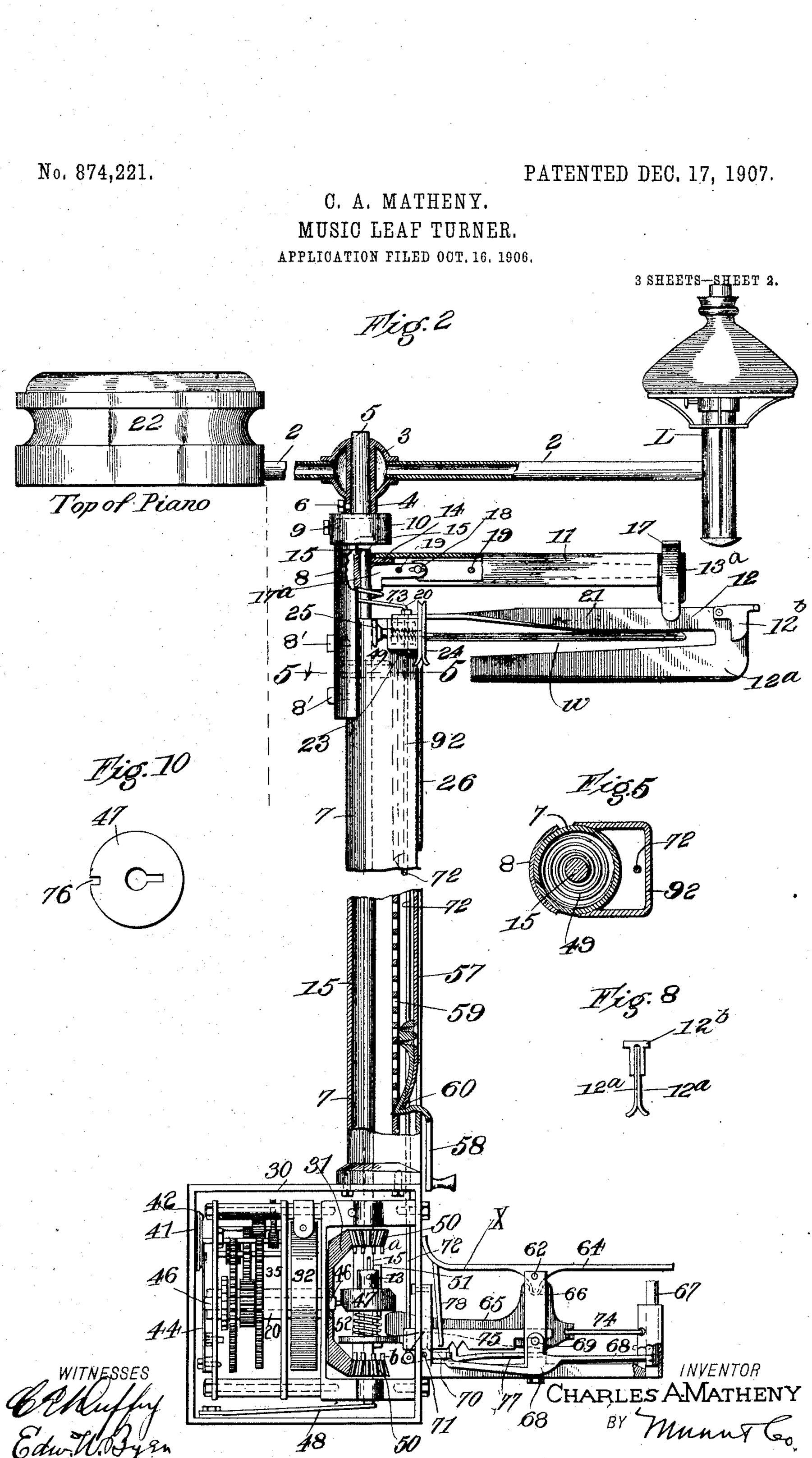
C. A. MATHENY.

MUSIC LEAF TURNER.

APPLICATION FILED OCT. 16, 1906.

3 SHEETS—SHEET 2.

Fig. 2



WITNESSES

C. E. Duffy

Edw. W. Byrn

INVENTOR

CHARLES A. MATHENY

BY Munn & Co.

ATTORNEYS

No. 874,221. PATENTED DEC. 17, 1907.

C. A. MATHENY.

MUSIC LEAF TURNER.

APPLICATION FILED OCT. 16, 1906.

3 SHEETS—SHEET 3.

Fig. 3

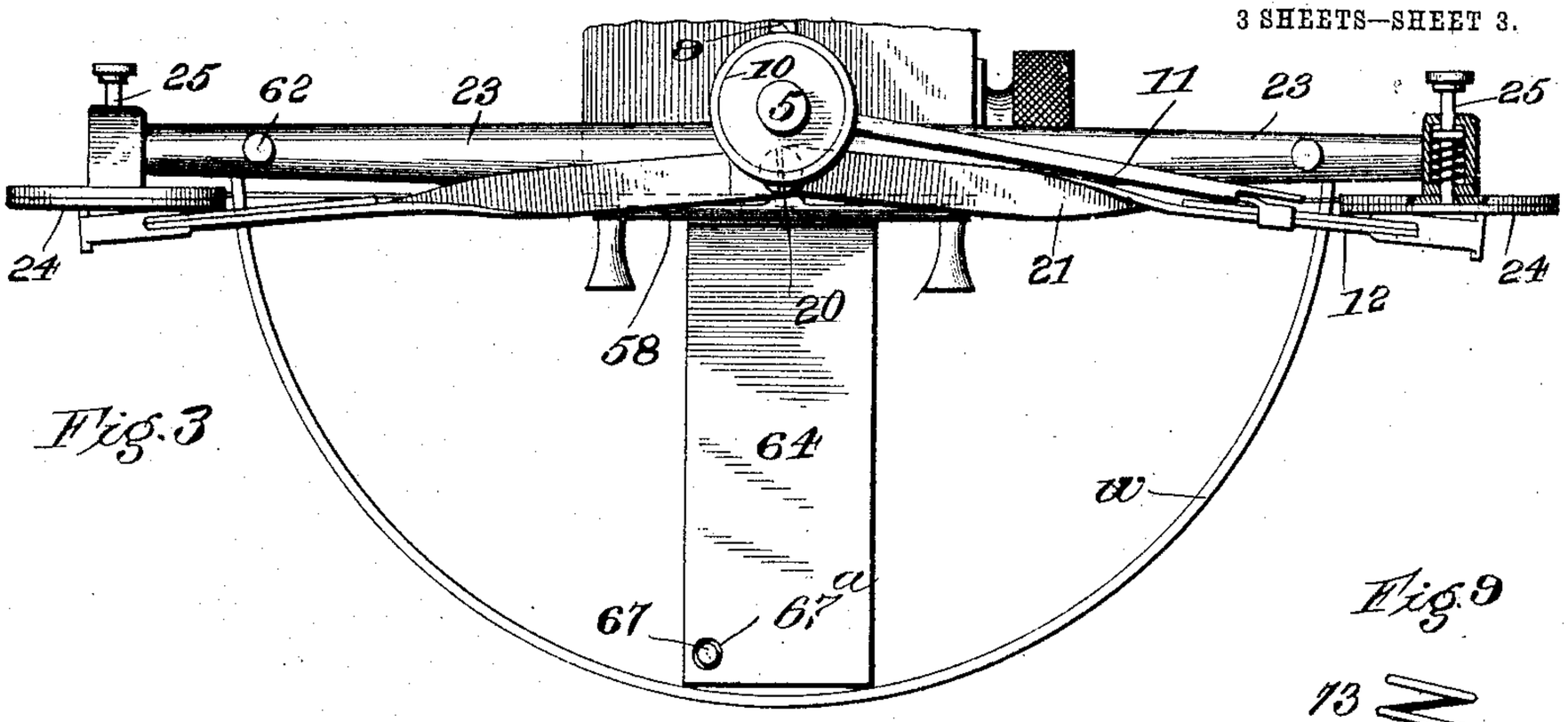


Fig. 4

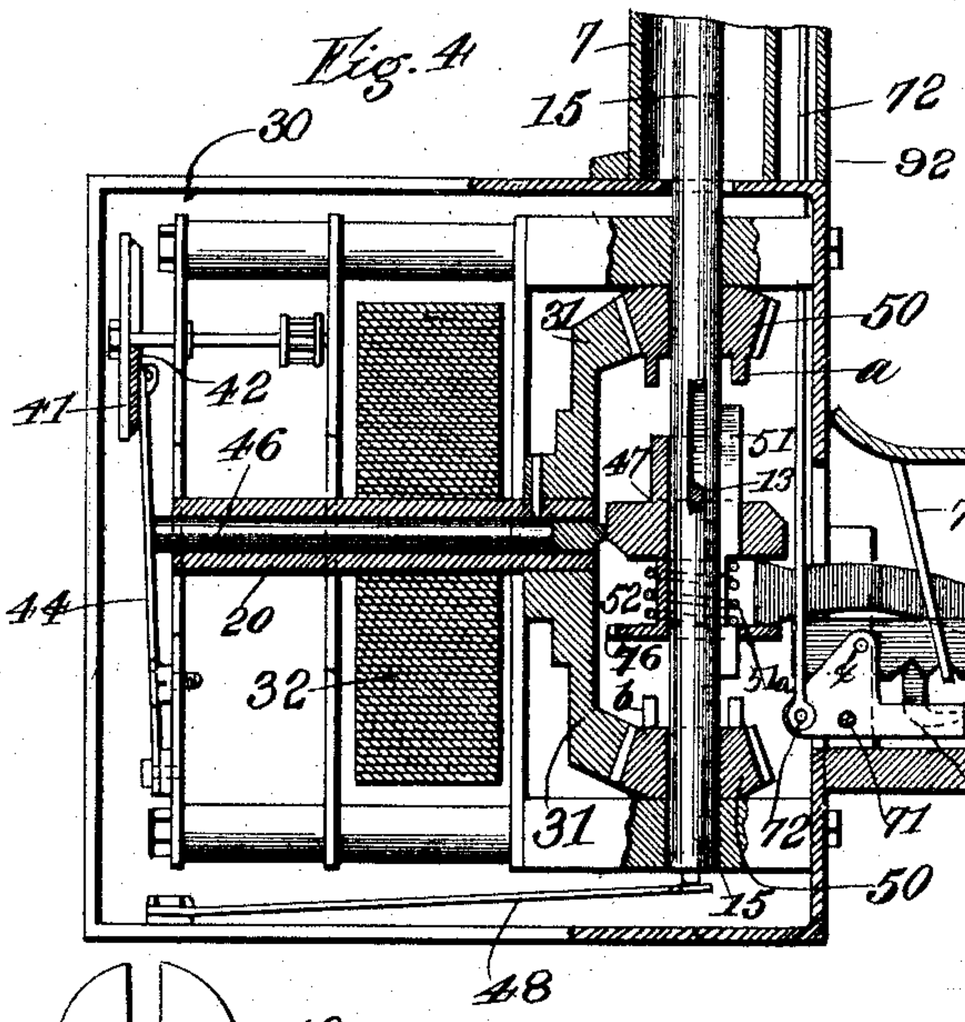


Fig. 9

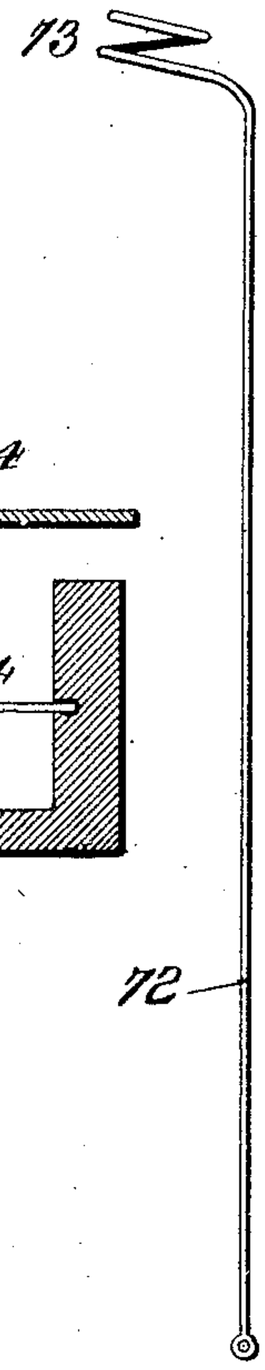


Fig. 6

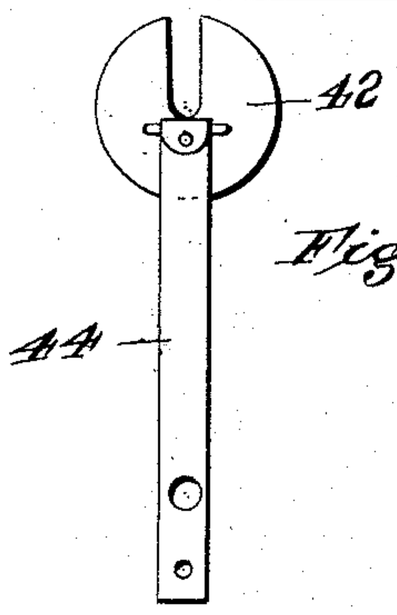
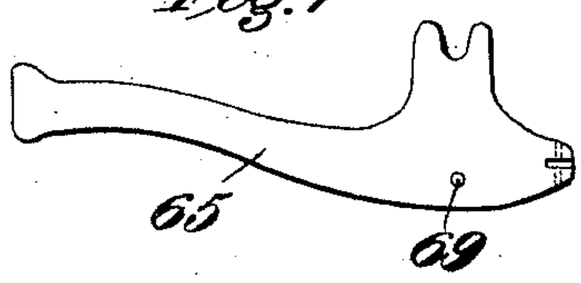


Fig. 7



WITNESSES

C. E. Hluffy

Edw. H. Byrn

INVENTOR

CHARLES A. MATHENY

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

CHARLES ARMSTRONG MATHENY, OF MONTGOMERY, ALABAMA.

MUSIC-LEAF TURNER.

No. 874,221. Specification of Letters Patent. Patented Dec. 17, 1907.

Application filed October 16, 1906. Serial No. 339,207.

To all whom it may concern:

Be it known that I, CHARLES ARMSTRONG MATHENY, a citizen of the United States, and a resident of Montgomery, in the county of Montgomery and State of Alabama, have invented certain new and useful Improvements in Music-Leaf Turners, of which the following is a specification.

My invention is in the nature of a music leaf turner so organized with a lamp as to enable the same frame which supports the lamp to also support the music leaf turner in proper relation to the lamp to have the music lighted thereby.

In my music leaf turner the music sheets are suspended from the top edges, each sheet being received in an individual clasp or holder and by suitable mechanism, hereafter described, a radially swinging turning arm is made to vibrate in a horizontal plane back and forth, as the music sheets are successively turned, taking over one sheet at a time, or allowing any sheet to be repeated at will.

My invention consists in the novel construction and arrangement of parts hereinafter described in relation to the drawing, in which

Figure 1 is a front elevation of the music leaf turner. Fig. 2 is a side elevation of the same, partly in section, also showing the relation of the lamp and supporting frame. Fig. 3 is a plan view with the lamp removed. Fig. 4 is an enlarged vertical section through the operating mechanism at the bottom. Fig. 5 is a cross section on line 5—5 of Fig. 2. Fig. 6 is a detail face view of the friction brake for stopping the motor mechanism. Fig. 7 is a detail of lever 65 for transmitting the movement of the finger key. Fig. 8 is an end view in detail of the clasps 12^a for holding the sheets of music. Fig. 9 is a detail view of the vertical rod 72 for connecting the elbow lever 70 with the turning arm above. Fig. 10 is a detail view of the lower end of the shifting hub 47. Fig. 11 is a detail view of lock bar 75, hub 47 and spring 77, and Fig. 12 is a sectional detail showing the relation of rod 72 to the coacting parts.

Referring to Fig. 2, the lamp L is supported upon the outer end of a tubular arm 2 which at its rear end is rigidly connected to a heavy bowl or casting 22, which is made sufficiently weighty to sustain the lamp and to also sustain in suspended position the various parts of the music leaf turner hereafter described. The bowl or casting 22 forms a font for oil to supply the lamp, which oil passes through the tube 2 to the lamp, passing in transit around a hollow hub 3 in which is fixed an upright tube to receive a stem 5 by which the music leaf turner is supported. The oil font 22 is provided with an ordinary inlet and a screw top to give access to the interior thereof. Although I have shown an oil lamp with a font, I would have it understood that this lamp may be replaced by an electric lamp to which wires may be extended through the hollow tube 2, the part 22 in such case being only a weighty mass of metal to sustain the lamp, for which purpose it may be made solid.

Through the spherical hub 3 and its attached tube 4 is arranged a stem 5 connected to the music leaf turning devices below, the stem being held in position by a set screw 6 passing through tube 4 and bearing against stem 5. The stem 5 is a portion of or rigidly connected to a plate 8 fixed to the upright pipe 7 by means of two bolts 8^1, 8^1 which support the subjacent parts. Around the top of this plate 8 is a sleeve 10 which is rotarily adjustable about a vertical axis, and is secured by a set screw 9. This sleeve 10 is for the purpose of adjusting the turning arm 11 at its normal height when operating the machine. This sleeve 10 bears on its lower edge a cam surface which is longer or deeper on the left side, as shown in Fig. 1, which cam surface allows the turning arm to gradually rise when swinging back to the right after turning a sheet of music to the left, thus allowing the outer end of a trip 17 to drop down in front of a music holder 12 as will be more fully described hereafter. It will be understood that there are a number of these music holders 12, one being provided for each sheet of music and they swing about a vertical axis and are successively turned by the action of the vibrating turning arm 11 from one side to the other as the music is progressively played.

The turning arm 11 is a piece of sheet metal doubled over longitudinally and secured to a central hub portion 14, rigidly connected to the vertical turning rod 15. The outer end of the turning arm 11 is cut away on the front side at 13^a to allow space for the movement of the trip 17. This trip 17 has a vertical up and down movement for the purpose of rising and going over the music leaf holder 12. Its motion is controlled

through the action of the cam sleeve 10 and spring 73 as follows. One side of the turning arm 11, behind the trip 17 is longer than the other side and projects downwardly forming a lip which catches behind the music holder 12 when the turning arm 11 is pulled down by means of rod 15 as hereafter described, and carries the music holder 12 around to the left side. The trip 17 is made in two parts 17 and 17ª, loosely hinged together at 18, and the two parts of the trip are fulcrumed in the turning arm by means of centers 19 so as to permit the outer end of the trip 17 to have a motion up and down.

I will now describe the construction of the music holder 12, Figs. 2 and 8. This consists of two pieces of thin metal 12ª, 12ª, carried on the outer end of the radial arm 21 of spring steel, which spring arm turns on a vertical bolt 20. The two pieces of the music holder 12ª are connected to the outer end of the spring arm and extend inwardly like wings and are flared slightly apart away from each other along their lower edges to receive between them the upper edges of a sheet of music. A pivoted clip 12ᵇ is made to straddle the outer ends of holders 12ª and pinch them together. There may be any number of these music sheet holders sufficient to accommodate the largest portfolio of music. The spring arm 21 of the music holder is twisted in its length so as to spring upwardly to allow it to be lifted so as to insert a sheet of music therein easily. All of the music leaf holders are hung upon the same pivotal axis 20, and fold close together. Immediately beneath the arm 21 of the music holders there is arranged in fixed position a semi-circular piece of wire *w*, Fig. 3, which occupies a horizontal plane and each of whose ends is rigidly connected to a cross-arm 23 mounted upon the top of the stationary tube 7. This piece of wire *w* acts as a support to steady the music holders while the music is being turned and it occupies a position between the spring arm 21 and their inwardly projecting wings as seen in Fig. 2.

For holding the outer sheets of music while the inner sheets are being turned there are arranged on opposite ends of the cross arm 23 clasps 24 of circular form, Fig. 1, with their lower edges flared away from each other, as seen in Fig. 2. The inner one of the plates is soldered rigidly to the cross-arm 23 at each end, see Fig. 3, and the outer one is screwed onto a small stem 25 that extends through the cross-arm 23 and has a coil spring around it whose tension holds the outer plate against the inner plate to clasp the outer sheets of music. Extending from one of these clasps 24 to the other and occupying a vertical plane there is a second wire 26, Fig. 1, which is curved downwardly and connected to the central standard, which wire 26 acts as a guide to cause the music sheets to enter between the bottom edges of the clasp.

If a book is to be used a special book support is provided as follows. The tubular standard 7 is provided along its front edge with a rectangular casing 92, Fig. 5, extending the full vertical length of the tubular standard and soldered to its sides. The lower portion of this rectangular casing is slotted in front to receive a book support 58, Figs. 1 and 2, consisting of a cross-bar with two pins to support the lower edge of the book. From this cross-bar there extends a spring 57 which passes up through the slot in the rectangular casing and is provided on its rear side with a toe or projection 60 which is adapted to enter one of a series of holes 59 in the front surface of the tubular standard 7. By pulling the book support 58 to the front it may be raised or lowered to any desired point and is sustained by the entry of its toe into one of the several holes 59. The vertical adjustment of the book support 58 permits books of any size to be carried thereon. For holding the upper edges of the backs of a book there are, see Fig. 1, journaled in the cross arms 23 on each side of the tubular standard, book holders 61 consisting of crank arms which are arranged to swing about vertical axes in the cross arm 23 and secured in position by screw caps 62. When the book is to be inserted, it is first placed upon the pins of the subjacent book support 58, and is then raised to its position and the book holders 61, see Fig. 1, adjusted inside the edges of the backs of the book and retained by the screw clamps 62.

The vertical turning rod 15 which operates the turning arms at the top of the apparatus extends all the way down through the tubular standard 7 and enters the casing 30 of a motor mechanism, whose operation I will now describe. This motor mechanism partakes of the general character of a clock mechanism and comprehends a coil spring 32, see Figs. 2 and 4, a tubular shaft 20 and a series of gears 35. The final shaft of the series of gears is provided with a friction disk 41, Fig. 4, against which bears a friction shoe 42, Fig. 6, hinged to the top of a spring 44 whose lower end is fixed to a stationary part of the motor frame. The main shaft 20 is rigidly connected to a large bevel wheel 31. This bevel wheel is permanently engaged with two bevel pinions 50, 50, loosely turning on the vertical turning rod 15 on opposite sides of the tubular shaft 20. One of these bevel pinions 50 is made to turn the turning rod 15 and turning arm 11 in one direction and the other pinion 50 is made to turn them in the opposite direction and said pinions may be alternately engaged with the turning shaft 15 by an intermediate shifting clutch. On the lower part of the upper pinion 50 are formed clutch teeth *a* and on

the upper part of the lower pinion 50 are formed clutch teeth *b*. Sliding vertically on the turning shaft 15 is an adjustable hub 47 recessed in the middle to form upper and lower flanges, and which by means of a pin 13 fixed to the hub and entering a longitudinal slot in the turning shaft 15, is susceptible of vertical adjustment in relation to the turning shaft but rotates rigidly with it. Sliding vertically within a channel in the hub 47 is a shifting lock bar 51 which extends slightly above and also below the shifting hub. This shifting lock bar 51 is formed on its side with a notch 51ª, see Fig. 4, and around this notch and the recessed portion of the hub 47 between its flanges is wound a spiral spring 52 which holds the shifting bar 51 in position but allows it to yield slightly in a vertical direction. With this construction it will be seen that when the shifting hub 47 is adjusted to its highest position the upper end of the shifting lock bar 51 entering the teeth *a* of the upper bevel pinion 50 will engage said pinion and receiving therefrom the motion of the wheel 31 will rotate the turning shaft 15 in one direction. If, however, the shifting hub 47 is thrown to its lowermost position, then the locking bar 51 leaves the teeth *a* of the upper pinion and the lower end of said locking bar engages the teeth *b* of the lower pinion, which will lock it thereto and will cause motion of the bevel wheel 31 to be transmitted through the lower pinion 50 to the hub 47 and thus turn the turning rod 15 in the opposite direction. The upper and lower ends of the shifting locking bar 51 might be simply rigid lugs formed on the lower and upper ends of the shifting hub 47 but for the fact that a slightly yielding motion of these lugs is necessary to cause them to properly enter the teeth *a* and the teeth *b* below. This yielding motion is provided for by the notch 51ª in the locking bar 51 and the spiral spring 52 wound thereabout.

Within the center of the hollow shaft 20, Fig. 4, there is arranged a sliding push bar 46 whose back end bears against a spring 44 of the brake shoe 42. The front end of this push bar bears peripherally against the thick upper flange of the rotating shifting hub 47. The vertical adjustment of the shifting hub 47 is made to start and stop the motor mechanism, as follows. At one point on the lower edge of the upper flange of the hub 47 and at an opposite point on the upper edge of said flange the metal is cut away obliquely to form a bevel.

The turning rod 15 passes entirely through the lower bevel pinion 50 and is stepped upon the end of spring 48 which normally holds said turning rod in its uppermost position.

When the hub 47 is thrown into its lowermost position the push rod 46 in yielding to the tension of spring 44 moves inwardly over the sharp top edge of the upper flange of the shifting hub 47, and in doing so withdraws the brake shoe 42 from the brake disk 41, and allows the motor mechanism to start the turning rod 15 with arm 11 and hub 47 to the left. When the beveled part of the top edge of the upper flange of hub 47 has turned to alinement with push rod 46, then (the operator's finger being removed from the key 64) the spring 48 will force rod 15 up, carrying hub 47 up, and then the beveled part of the top edge of hub 47 will force the push rod 46 out against the brake spring 44, thus bringing together the brake shoe 42 and brake disk 41 and stop the machine.

I will now describe the means for imparting the necessary adjustment to the hub 47 to permit the above described movements to take place.

The circumferential recess of the hub 47, Figs. 2 and 4, receives the end of a lever 65 which is pivoted at 69 and is held in a normal position of rest by a spring bar 74 connected to the lever 65 at one end and to a stationary part of the frame at the other. The lever 65 is formed with a knuckle joint at a point above the fulcrum 69 consisting of a recess into which depends a projection formed on the lower surface of a tilting finger key 64 which latter is fulcrumed at 62 and which is arranged to be struck by the finger of the operator when it is desired to turn a leaf of music.

The advanced movement of the turning arm 11 from right to left is effected through the lower gear 50 and the return of the arm from left to right preparatory to turning another sheet to the left is effected by a coil spring 49, Fig. 5, near the top of the tubular standard 7, one end of the spring 49 being attached to the tube 7 and the other to the turning rod 15.

To turn music which is not to be repeated the operator strikes the finger bar 64 on its extreme outer end. This action tilts the finger bar 64 about its fulcrum 62 and throws down the inner end of the lever 65 by means of the knuckle joint 66 and thus pulls the shifter hub 47 and turning rod 15 down and the locking bar 51 is made to engage the teeth *b* of the lower bevel pinion 50. At the same time the brake spring 44 forces the push rod 46 over the top edge of the upper flange of shifting hub 47 which separates the brake shoe 42 from the brake disk 41 and allows the machine to start, turning the shifter hub 47 only a half revolution to the left. When the beveled top edge of the upper flange of the shifting hub comes into alinement with the push rod 46, the spring 48 (the operator's finger having been removed) forces the turning rod 15 and shifter hub 47 up and the shifting hub in turn forces the push rod 46 against the

brake spring 44 which brings the brake shoe 42 against the brake disk 41 and thus stops the machine. Following this action the flat coil spring 49 at the top of the tubular standard swings the turning rod 15 with the shifting hub 47 and the turning arm 11 back to its former position to the right ready for another turn of the next sheet of music.

If a sheet of music after having been turned to the left is to be repeated, said sheet is turned back again and for this purpose special devices are provided which I will now proceed to describe.

The finger bar 64 is formed in one of its corners at its outer end with a hole 67[a], as seen in Fig. 3, and immediately beneath this hole is arranged a vertically sliding plunger 67, see Fig. 2, whose lower end is connected to the outer end of a tripping lever 68 fulcrumed at 69. The inner end of this tripping lever is made to engage with the under side of an outturned end of the elbow lever 70 which is fulcrumed at 71, see Fig. 4, and at its inner end the elbow lever 70 is connected to a vertical pull rod 72 having at its upper end a coil 73, Figs. 2, 4 and 9, which incloses the turning rod 15 at a point immediately beneath the inner end of the turning arm 11 and coöperating with section 17[a] of the tripping bar. The upper end of the pull rod 72 moves freely in a hole in the cross arm 23, as seen in Fig. 12.

A horizontally sliding locking bar 75, see Fig. 4, is pivoted to an upward extension of the elbow lever 70 at x and is made to advance to and enter a notch 76, Figs. 4 and 10, in the edge of the lower flange of shifter hub 47 whenever the plunger 67 is depressed and after hub 47 has turned a half revolution to the left. A spring 77 with a tooth is made to engage notches in the lower side of the locking bar 75, see Figs. 4 and 11, to hold it to its place. Depending from the inner end of the finger bar 64 is a projection 78 which extends down to a position immediately above the outer end of the elbow lever 70. Now if a sheet of music is to be repeated after being turned to the left, the operator would strike the finger bar 64 at a point immediately over a hole in the outer end of finger bar 64, which hole is, Fig. 3, directly above the plunger 67, with the result that the plunger 67, Fig. 2, is depressed and carries down with it the outer end of the lever 68 and raises the outer end of the elbow lever 70, Figs. 2 and 4, causing the pull rod 72 with coiled end 73 to be pulled down out of the path of trip section 17[a], Figs. 2 and 12, thus allowing trip 17 to remain down in front of the sheet holder 12, for the purpose of carrying the sheet of music back to the right to be repeated.

When throwing the outturned end of the bell crank 70 up by means of the plunger 67, it moves the locking slide 75 against the edge of the lower flange of shifter 47 and when the shifter hub 47 turns one-half revolution a spring 77 will go further up in the outer notch of 75, as indicated in dotted lines in Fig. 11, and forces said catch 75 into the notch 76. This catch 75 holds the rod 15 with hub 47 and turning arm 11 to the left when the music is to be repeated, and is thrown out by means of the projection 78 formed on the lower inner end of the finger bar 64 by striking the finger bar 64 at X with the finger. The projection 78 in descending strikes bell crank 70 on top of its outer end and causes the necessary outward movement of the locking slide 75 to separate it from the notch 76 of the shifting hub 47.

When the finger bar 64 is struck at X on the inner end, this, it will be seen, tilts said bar 64 in the reverse direction to normal operation and causes the lower end of projection 78 to strike the outer end of elbow lever 70, see Fig. 4, thus throwing down the outer end of elbow lever 70, and raising the inner end of said lever, and lifting the pull rod 72 with coiled upper end 73. This places said coiled end 73 (see Figs. 1, 2 and 9) up in the path of trip 17[a] for the purpose of raising the outer end of trip 17, as when turning sheet to the left and not to be repeated, thus allowing the arm 11 with trip 17 to swing back to the right for another sheet of music. Now just before said arm 11 gets back to the right, the trip 17 will be lowered down in front of holder 12, because of the spiral shape of coiled end 73 (see Fig. 9) to keep trip 17 from catching more than one sheet holder 12.

The mechanism as described is suitably inclosed in a case 30 and the spring 32 of the motor mechanism is wound up when run down by means of a key knob K, Fig. 1, which is connected to a bevel pinion k engaging the large gear wheel 31.

Among the advantages of my invention, I would call attention to the following: It can be applied to any piano or organ without any cutting, scratching or mutilating of the same; the music leaves can be positively and at will turned back whenever it is necessary to repeat; the device is suspended from the top and is out of the way of the keyboard and the hands of the player; it is capable of handling either single sheet music or books; the lamp is so arranged as to be supported by the same devices and in position to throw the light directly on the music; it is easily operated by any one without rising from the seat, and it is positively driven so that the operator has only to touch the operating key. Most sheet music is made with one large or double sheet with one or more loose sheets inside. Now in clamping or holding these loose sheets it is quite necessary to have a long clamp along the top edge of these loose sheets; in order to keep the lower end of

sheet from swinging outward and striking the operator in the face when they are turned quickly and also having a long bearing along the top of said sheet to keep the loose sheets from tearing or doubling over, or hanging to one side. It will be seen that my sheet holders are constructed with a long wing extending inward for this purpose and below the semi-circular support. In my device also the sheet holders will lie close together, one within the other, when folded together. For this purpose I have twisted each sheet holder arm one-half turn in its length so that they will nest or lie close together.

What I claim is—

1. A music leaf turner having sheet holders consisting of pivoted arms having attached at their outer ends two inwardly extending clamping wings arranged parallel to the arms and below the same.

2. A music leaf turner having sheet holders consisting of pivoted arms having attached at their outer ends two horizontal inwardly extending clamping wings and a clip for pinching the outer ends of said wings together.

3. A music leaf turner having pivoted arms bearing swinging sheet holders for each sheet, each holder consisting of two horizontal wings attached at their outer ends to the pivoted arms and projecting inwardly beneath the same and a stationary semi-circular support located between the pivoted arms and inwardly projecting wings.

4. A music leaf turner having swinging sheet holders, each consisting of a pivoted arm made flat in cross section and twisted in its length and bearing at its outer end two horizontal and inwardly projecting clamping wings arranged to lie compactly against each other when folded together.

5. A music leaf turner having separate horizontally swinging sheet holders, a horizontally oscillating turning arm with a pivoted trip, a motor mechanism, and means for controlling the position of the trip.

6. In a music leaf turner, a swinging sheet holder consisting of an arm having horizontal spring blades attached to the outer end of the arm and extending inwardly below the same.

7. A music leaf turner comprising a vertical hollow standard with sheet holders and turning arm at the top, a motor mechanism at the bottom with reversing clutch and key controlled shifting devices, and means for sustaining the music between the motor mechanism and turning arm.

8. A music leaf turner, comprising a vertical hollow standard, swinging sheet holders, a turning rod within the hollow standard bearing a turning arm at the top, a motor mechanism at the bottom, and a reversing clutch mechanism between the motor and turning rod for positively turning the turning rod in another direction.

9. A music leaf turner, comprising a vertical hollow standard, swinging sheet holders, a turning rod within the hollow standard bearing a turning arm at the top, a motor mechanism at the bottom, a reversing clutch mechanism between the motor and turning rod for positively turning the turning rod in either direction, and a double tilting finger key fulcrumed in the middle and connected to the clutch mechanism to shift it in one direction when tilted on one side of its fulcrum and to shift the clutch in the other direction when said finger key is tilted on the other side of the fulcrum.

10. A music leaf turner, comprising a vertical hollow standard, swinging sheet holders, a turning rod within the hollow standard bearing a turning arm at the top having a movable trip, a motor mechanism at the bottom, a reversing clutch mechanism between the motor and turning rod, a double tilting finger key fulcrumed in the middle and connected to the clutch mechanism to shift it in one direction when tilted on one side of the fulcrum and to shift the clutch in the other direction when tilted on the other side of the fulcrum, and means for controlling the turning arm trip, said means being extended to the finger key.

11. In a music leaf turner, the combination of the turning rod 15, sliding shifter hub 47 with beveled edges, and spring seated lock bar 51, clutch gears 50, 50, on the turning rod on opposite sides of the shifter hub, a motor mechanism with hollow shaft 20 and rigid bevel gear 31 connected to the loose gears 50, a spring 44 with brake controlling the motor, a push rod 46 controlling the brake through the shifter hub, a spring for raising the turning rod, and means for shifting the shifter hub.

12. In a music leaf turner, the combination with the turning arm, the trip, the turning rod and its reversing clutch consisting of gears 50, 50, and sliding hub 47 with circular recess and notch 76; of lever 65 entering the circular recess of the hub and having spring 74, the double acting finger key 64 jointed to lever 65; plunger 67 and connected lever 68, the elbow lever 70 operated by lever 68, trip-actuating rod 72 connected to the elbow lever 70 and extending up to and controlling the position of the trip of the turning arm, the sliding locking bar 75 jointed to the elbow lever 70 and adapted to enter the notch 76 of the shifter hub and the spring 77 controlling the locking bar.

CHARLES ARMSTRONG MATHENY.

Witnesses:
JUNIUS J. PIERCE,
LOUSUS W. PIERCE.