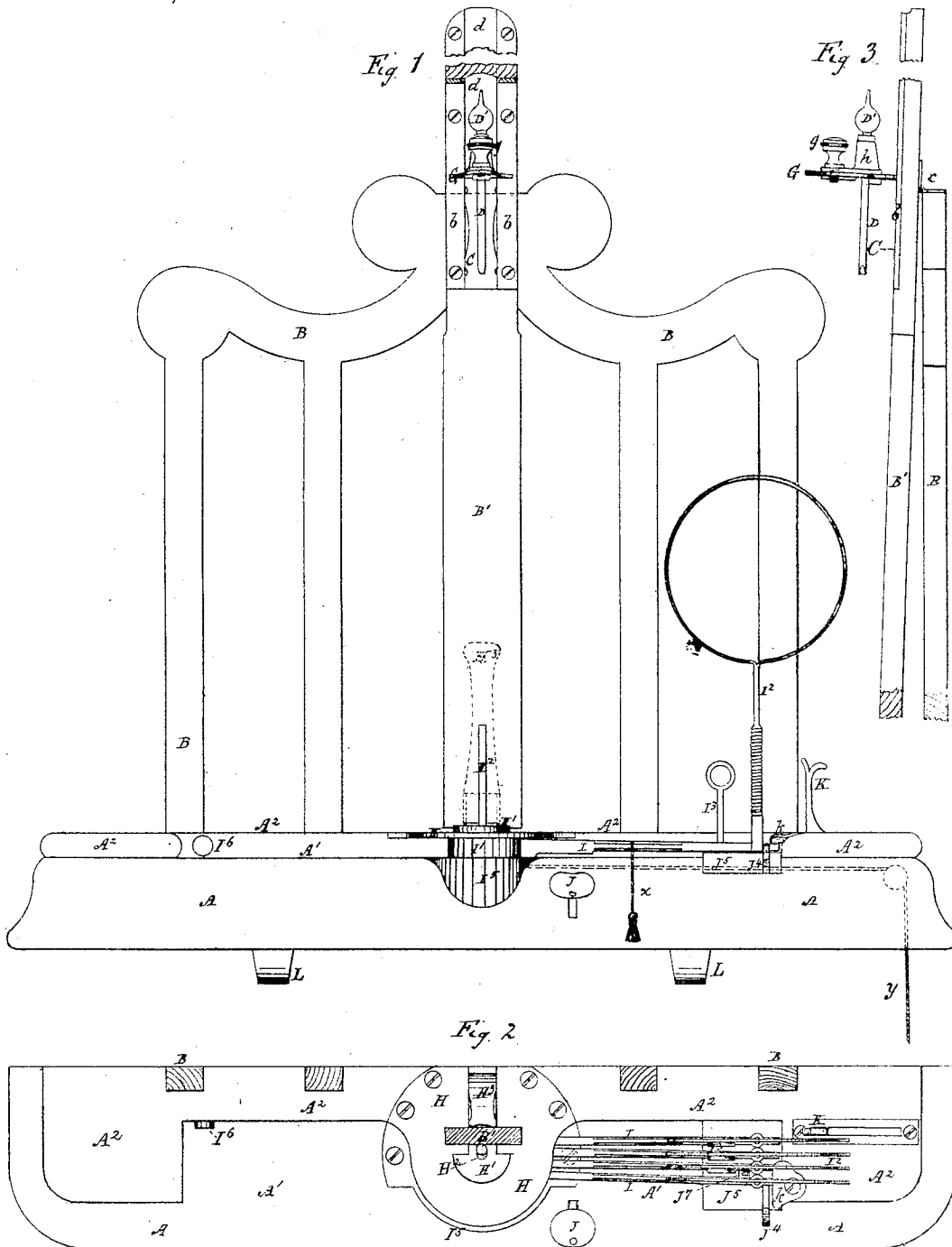


G. DOMINY.
Music Leaf-Turners.

No. 135,322.

Patented Jan. 28, 1873.



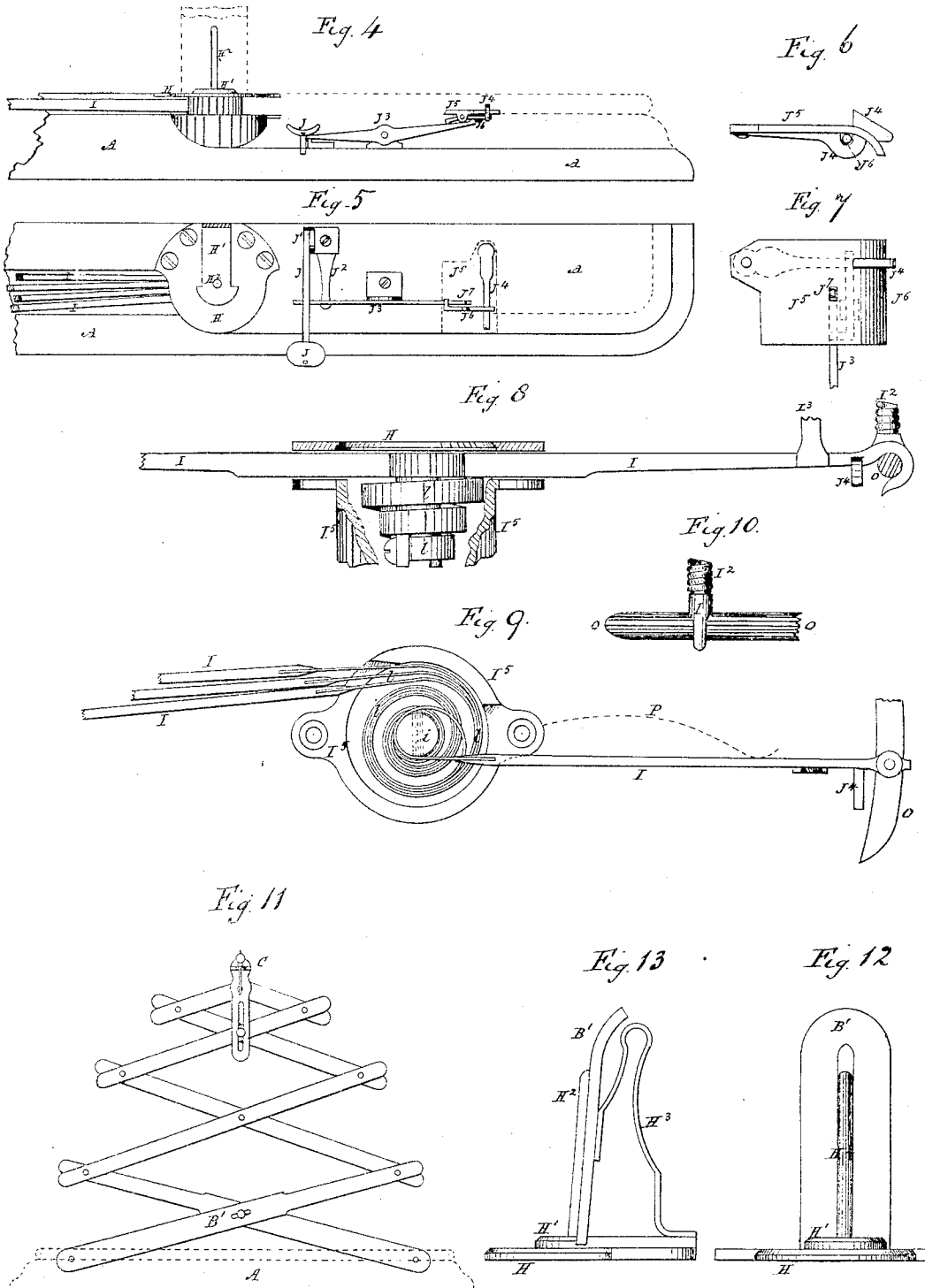
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Fig. 21

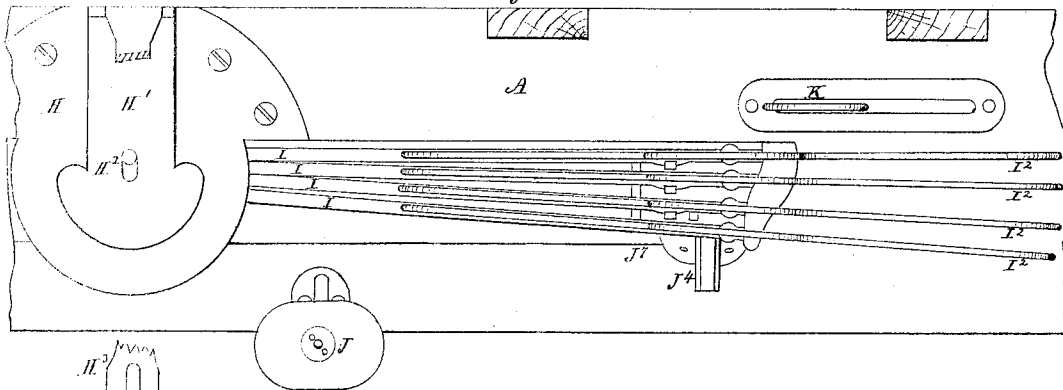


Fig. 23

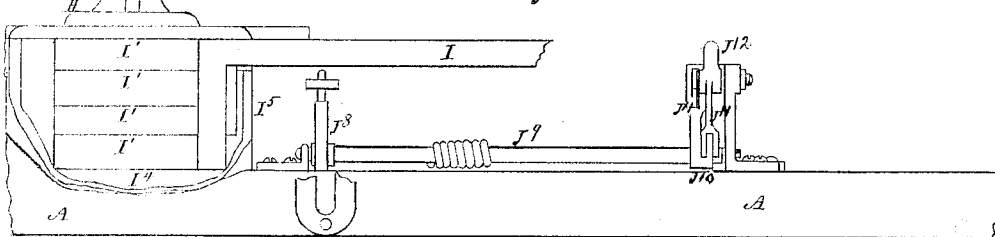


Fig. 24.

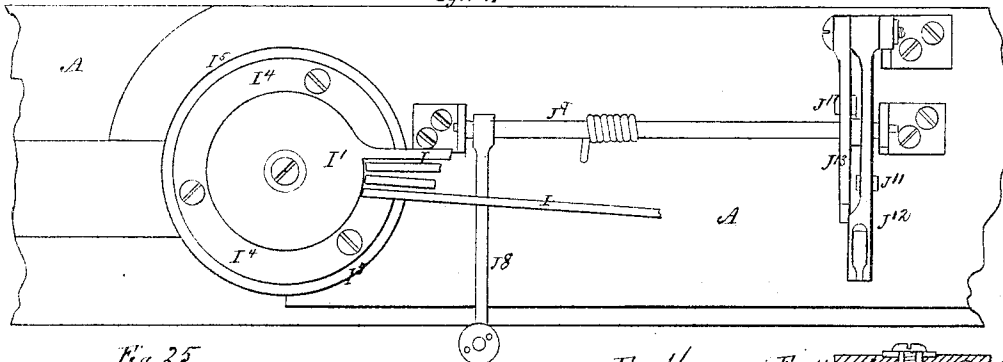


Fig. 25.

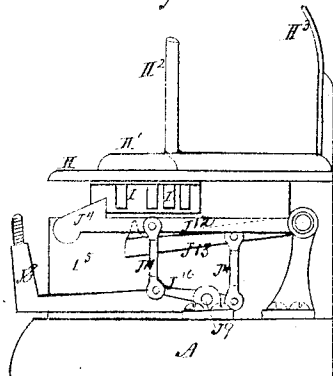


Fig. 16.

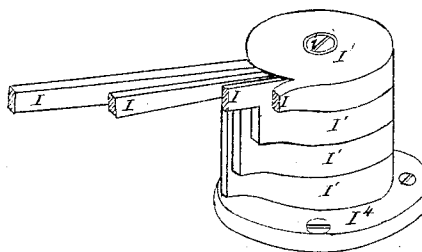


Fig. 14.

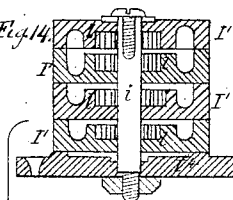
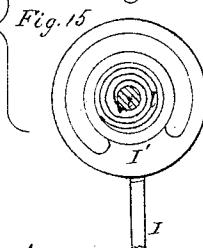


Fig. 15.



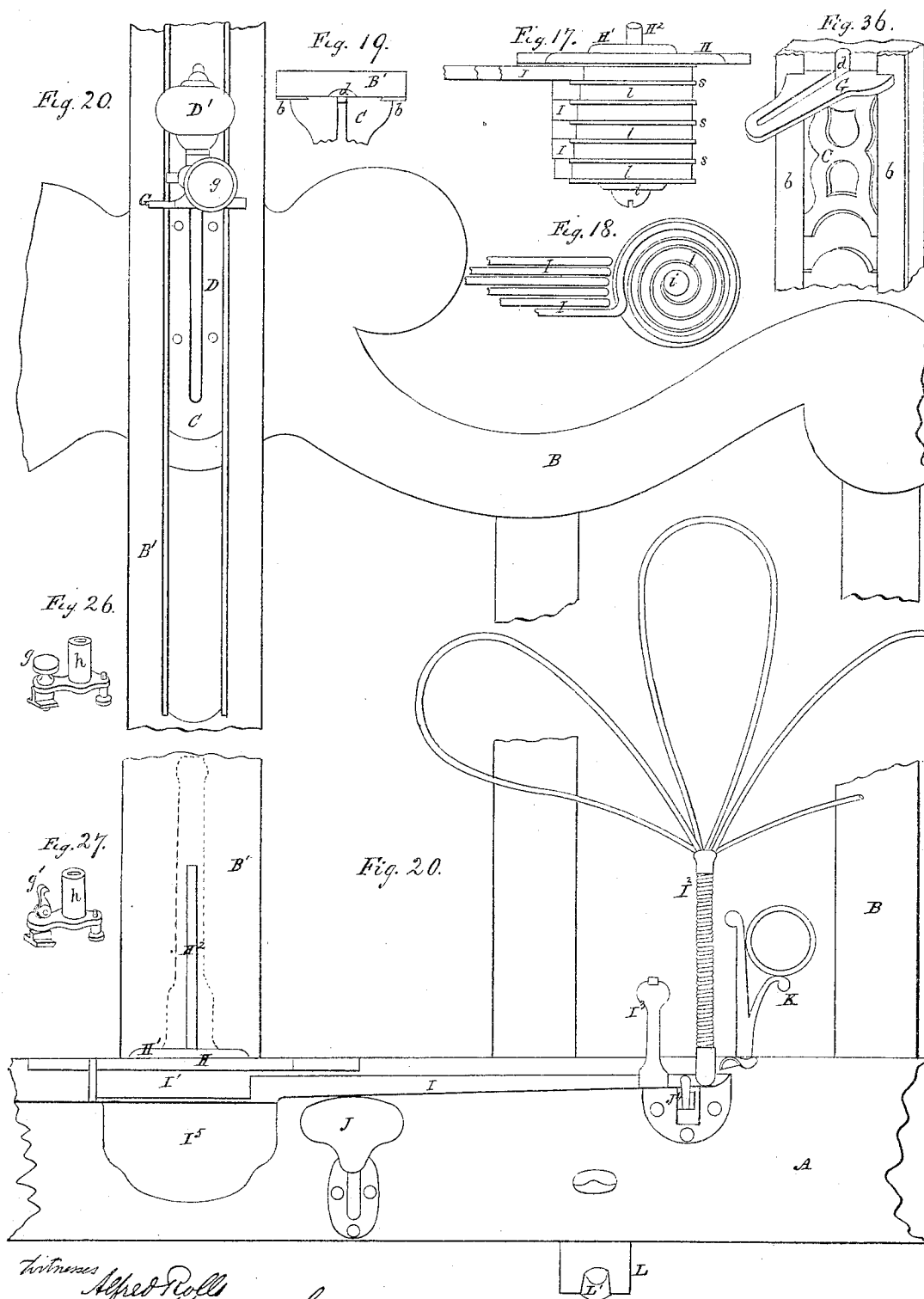
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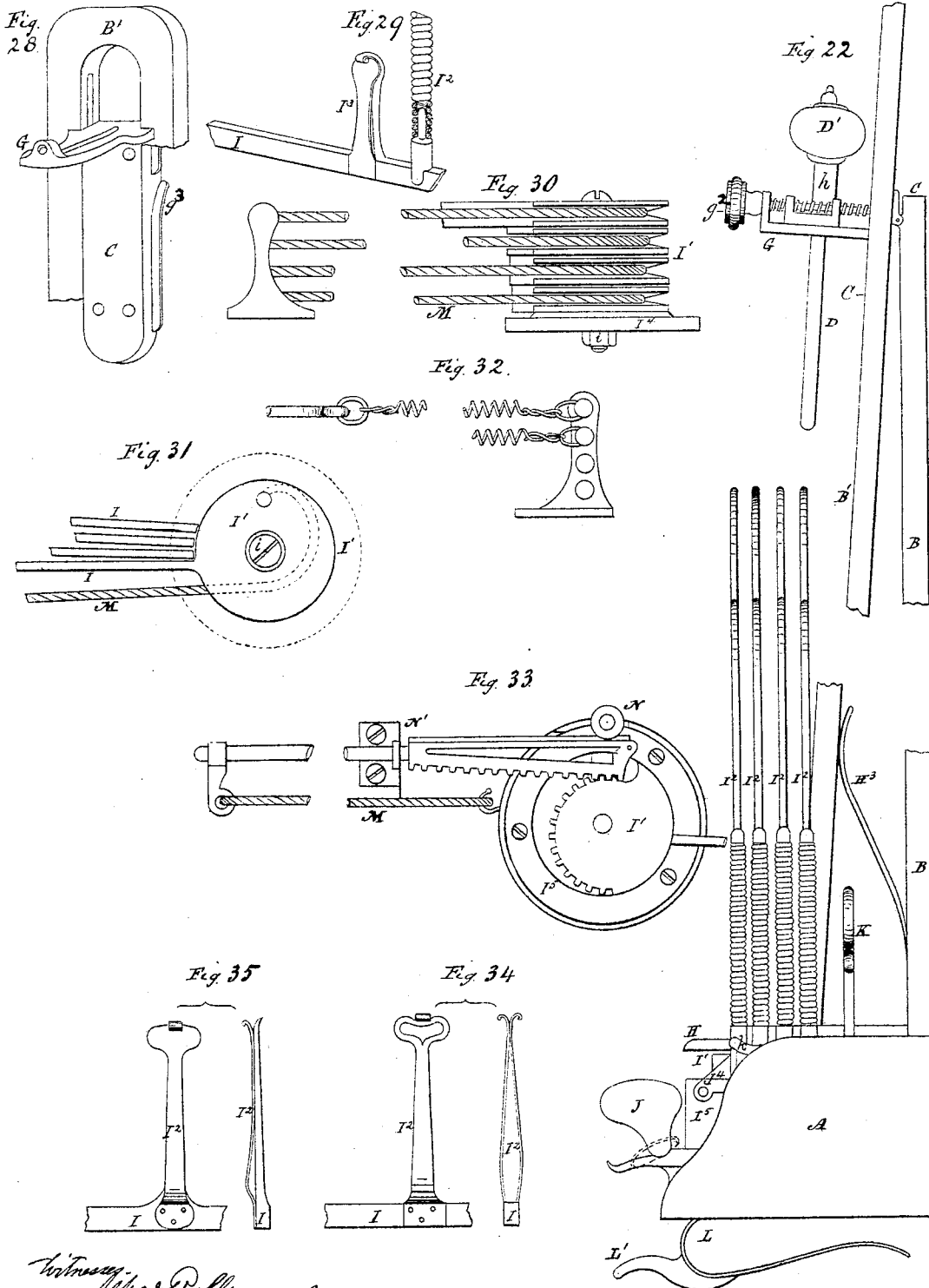
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UNITED STATES PATENT OFFICE.

GEORGE DOMINY, OF WEYMOUTH, ENGLAND, ASSIGNOR OF ONE-HALF HIS
RIGHT TO JAMES RUSSELL, OF SAME PLACE.

IMPROVEMENT IN MUSIC-LEAF TURNERS.

Specification forming part of Letters Patent No. 135,322, dated January 28, 1873.

To all whom it may concern:

Be it known that I, GEORGE DOMINY, of Weymouth, in the county of Dorset, England, have invented certain new and Improved Means of and Apparatus for Turning over the Leaves of Music and other Books, of which the following is a specification:

It is the object of this invention to furnish an improved apparatus for turning over the leaves of books, sheets of music, or other matter, automatically. It consists in the devices for securing the book or sheets to the apparatus, by which they are held securely thereto, and the leaves or sheets not intended to be turned are held firmly back so as not to interfere with the free working of the others; also, in making the devices by which this is accomplished adjustable to books and sheets of various degrees of thickness and height. It further consists in the manner of turning the leaves by a series of radial arms working from a common center, and having attached to their outward ends suitably-formed fingers or clamps, which grasp the leaf to be turned, the opposite or inner ends of which arms are connected with spring-impelled drums so arranged that by turning the arm from left to right the springs contained therein are coiled, compressed, or distended, and force stored up thereby sufficient to return the arm, with its leaf attached, to the left as soon as released. It still further consists in a compound catch by which the arms are released, one at a time, at the will of the operator, and which may be operated by the finger or by the knee, foot, or any other part of the body found convenient, through a suitable connection therewith, such as a cord, wire, rod, or pedal.

The apparatus may be made attachable to other instruments, or be an independent fixture placed on a suitably-shaped stand, and I propose calling the apparatus "The Music Klyiophyl."

In the drawing, Figure 1 is a front elevation of the apparatus. Fig. 2 is a plan of the same, shown with the back frame-work broken off. Fig. 3 is a fragmentary side elevation, showing how the center stave B' is connected to the frame, and how the sliding adjustable arm C G, with its attachments, is secured to the stave. Figs. 4, 5, 6, and 7 show the con-

struction and operation of the releasing-catch with the relative position of its parts. Figs. 8, 9, and 10 show one manner of attaching the springs to the ends of the arms, and Figs. 17 and 18 show another method. Fig. 11 shows a modification of the book-rest. Figs. 12 and 13 represent a modification of the center stave (B', Fig. 1) and its connections for securing the book to the apparatus. Fig. 14 is a vertical section of the drums from which the arms proceed. Fig. 15 is a plan view of the same, showing how the coiled spring is concealed in and fastened to the drum and the fixed center bolt. Fig. 16 is a perspective view of the drums in position. Figs. 17 and 18 are an elevation and plan of the arm and coiled spring. Fig. 19 shows the manner in which the slide for the adjustable arm C G, Fig. 1, is formed. Fig. 20 is a fragmentary front elevation; Fig. 21, a fragmentary plan view; and Fig. 22 an end elevation of a modified and enlarged form of the apparatus, seen in Figs. 1, 2, and 3. Figs. 23, 24, and 25 are a fragmentary front elevation, plan and end elevation, respectively, of the releasing-catch used on the preceding modification. Fig. 26 represents the sliding plate, which forms the guide for the pin D D', Figs. 1 and 3, removed from its slotted bed on the plate C G. Fig. 27 is a modification of the same device. Fig. 28 shows one manner of attaching the adjustable sliding arm C G to the center stave. Fig. 29 shows the manner of attaching the fingers I² to the arms I. Figs. 30, 31, and 32 show various modes of attaching elastic cords, or cords and springs, to the arms. Fig. 33 shows the manner when a rack and toothed eccentric are used. Figs. 34 and 35 represent modifications of the fingers I², shown in Fig. 1. Fig. 36 is a modified form of the sliding arm C G.

As represented in the drawing, A is the base of the apparatus, having spring jaws or clamps L, Figs. 1 and 22, secured to the bottom thereof for the purpose of attaching it to musical instruments, such as the piano, organ, &c. The top of the base, in which most of the working-parts are concealed, is formed with two ledges, A¹ A², on the lower one of which, A¹, the radial arms work, and on the upper one, A², the bottom edge of the book is intended to be

placed, the upper one projecting forward at each end of the base. The form and relative position of these ledges will be understood upon reference to Figs. 1 and 2. From the back of the base the frame B rises, which may be of any suitable shape and ornamental design, made fixed or removable or folding; or it can be made on the principle of the lazy-tongs, with its connections modified accordingly, as seen in Fig. 11, for the purpose of greater portability. Hinged to the top and center of the frame, at *c*, Fig. 3, is the center stave B', part of which is represented broken off, by which the center of the book or sheets is secured to the apparatus, its lower end resting on the center plate H, where it embraces a guide, H¹, which prevents it moving laterally, it being free to move a short distance backward and forward to render it adjustable to books of various degrees of thickness, and is pressed forward by a spring, H³, from behind against a center pin, H², in front. Between this pin and the center stave the lower and central part of the book is placed, where it is securely held. Screwed to the upper part of the center stave are two strips of metal, *b b*, Figs. 1 and 19, the inner edges of which are beveled off in opposite directions, so that they form, in conjunction with the level surface of the stave to which they are attached, a dovetail slide or groove, as seen in plan view at Fig. 19, in which the arm C G, Figs. 1 and 3, is held, being free to move vertically. This arm is bent at right angles, the vertical part C being secured in the slide referred to, while the part G projects outwardly from the center stave. Between the metal strips, Fig. 1, is formed a groove, *d*, into which a secret spring, not shown in the figure, fastened to the part C of the arm, projects and bears against the sides of the same, and serves to retain the arm at whatever position it may be placed. The arm G is provided with a slot, in which a small plate, seen detached and in full in Fig. 26, is free to move, to which is attached a sleeve, *h*, and a binding-screw, *g*, or its equivalent. The sleeve forms a guide for the pin D D', Figs. 1 and 3, in which it is free to slide vertically. This pin is for the purpose of fastening the top part of the book to the apparatus, and is placed in the center or fold of the book, when in the proper position. The adjustability vertically of the arm C G, and of the sleeve carrying the pin D horizontally, adapts the apparatus to receiving books of different height and thickness. The center stave need not be the full length, as seen in Fig. 1, as the spring H³ may be modified in form and attached to a short stave at the bottom of the frame, as represented by Figs. 12 and 13, while the arm C G could move in slides attached directly to the top of the frame, or the center pin H² may be substituted for the stave, by being made movable and actuated by a spring in a corresponding manner. Instead of the binding-screw *g*, Figs. 1 and 26, a small eccentric or cam, *g*¹, Fig. 27, may be used, or a screw, *g*²,

Figs. 20 and 22, running from end to end and parallel to the slot in the plate G, shouldered at either or both ends of the plate, and working in a nut secured to the sleeve *h*, having at its outer end a milled head, by which it may be turned, and the pin D adjusted to any position on the slot, from which it cannot be moved without turning the screw; or a small spring-pawl may be attached to the sleeve *h* and engage with teeth on the slotted plate G, or vice versa, and answer the same purpose. In Fig. 28 the secret spring *g*³ is represented as forming the guide for the arm C G, which spring fits into a groove on each side of a longitudinal slot in the center stave. The spring is bent a little out of a straight line, sufficiently to cause it to press on the surface of the groove, and thus, by its friction, retain the arm C G at whatever part of the slot it may be placed. At the right-hand side of the upper ledge of the base, Figs. 1, 2, 20, and 22, is seen a fastening, K, pivoted to a little slotted plate screwed to the upper ledge, into which slot or groove it will fall and be embedded when not in use. A spring concealed below the slotted plate acting against the lower end of K, tends to keep it in an upright position when so placed, or in a horizontal one in the slot when not in use. This catch is for the purpose of fastening back the leaves not intended to be operated upon, so that they will not interfere with the working of the others, and need not be of any particular shape. The opposite of the base may also be furnished with the same. In the center of the base is formed a circular space, in which is embedded the semi-cylindrical case I⁵, the top of which is level with the lower ledge, in which is placed the series of short drums or disks I¹, from which the arms I proceed, Figs. 14 and 16. At the center of the upper ledge of the base, Figs. 1 and 2, is secured, the center or crown plate H, which projects over and covers the mouth of the semi-cylindrical case I⁵, leaving a space between the two through which the arms I project and are free to turn. In the case I⁵ is placed the series of short drums I¹, shown in vertical section in Fig. 14, which are secured together by a bolt or arbor, *i*, passing centrally through them, and which forms, also, the axis on which they partially rotate. This bolt is attached to a base-plate, I⁴, secured to the base at the bottom of the case I⁵, or the bolt may be attached to or form a part of the center plate H. The drums I¹, from which the arms I proceed, are placed one below the other, as seen in vertical section in Fig. 14; but the arms are so constructed that they all work on the same plane, as seen in perspective in Fig. 16, the arm from the first proceeding horizontally outward, the one from the next lower drum being bent upward till on a level with the first, when it also radiates horizontally on the same plane as the first, and so on with the others. In each of these drums is inclosed a coiled spring, *l*, one end of which is attached to the drum,

the other to the central axis, in the usual manner. These springs, when coiled by turning the arms from left to right, will react thereon, and return each arm to its original position at the left with sufficient force and velocity, on being released by the catch *J*. To the central bolt or arbor *i* may be suitably attached a ratchet-and-pawl worm and worm-wheel, or other equivalent device for turning the same and adjusting the tension of the springs, and their consequent force on the arms. At the outer ends of the arms are secured the vacuum-checks *I*³ and fingers *I*², (best shown in Figs. 1 and 2,) between which the leaf to be turned is embraced or clutched. The upper part of the fingers may be made of any suitable and ornamental shape. The lower part, where they are connected with the arms, is made of helices of wire, the coils being very close together, by which a great degree of flexibility is obtained, which renders it easy to place them between the leaves without danger of breaking them. The fingers are attached to the arms by a pin projecting from the latter, which fits tightly into the interior of the helix, Fig. 29; or, the end of the helix may fit into a corresponding socket on the end of the arm, if preferred, the finger being thus removable. One of these fingers is placed behind each leaf to be turned, and the vacuum-check in front. This check may have a spring attached, (Fig. 29,) to gripe the leaf, if preferred, but need not be of any particular form, its object being to prevent the leaf behind it from rushing forward into the partial vacuum formed by the leaf in front being rapidly moved away. Instead of these fingers and checks, any suitably formed spring clip or clasp, to grasp or embrace the leaf, such as represented in Figs. 34 and 35, will answer the purpose; or a cord or wire, slightly bent or coiled for elasticity, fastened to the outer end of the arm and passed up behind the leaf to the adjustable arm or holder *O G* at the top of the center stave, may be employed. The arms when turned to the right are there retained by the compound catch, which is capable of releasing one at a time at the operator's will. Most of the working-parts of the catch are concealed in the base of the apparatus, the knob *J* releasing catch *J*⁴ and arresting catch *J*⁷ only being visible outside. (Figs. 1 and 2.) Fig. 4 is an elevation of a part of the base *A* with the top removed, and Fig. 5 is a plan of the same parts. In these are represented the lever *J*, having a finger-knob on its end, the latter protruding through an opening in the top of the base. The lever is pivoted at *J*¹, and when it is depressed acts upon the end of another lever, *J*³, the latter resting on a spring, *J*², which keeps both in an elevated position when at rest. *J*³ is a small metal plate, on which the ends of the arms rest when turned to the right, shown detached and enlarged at Fig. 7. Through an opening in this plate the end of lever *J*³, which is turned

up and forms catch *J*⁷, protrudes and is free to move up and down; on the under side of the plate is seen the catch *J*⁴, shown enlarged in side view in Fig. 6, having one end flattened out and riveted to the plate *J*⁵, forming a spring which tends to keep it up close to the bottom of the plate; the other end has a hook with an inclined face, and projects above the top of the plate through a slot at the front side thereof, as shown in Figs. 6 and 7. In a recess next the hook-end of this catch rests one end of the little lever *J*⁶, which is pivoted in lugs on the under side of the plate and lies at right angles to the catch *J*⁴. The opposite end of this small lever is bent at right angles and rests on the larger lever *J*³, as seen in Figs. 5 and 7,) with which it is parallel, and by which it is actuated. *J*², Fig. 5, is a spring bearing against the left arm of the lever *J*³ tending to keep that end elevated, while it keeps the opposite end (which forms the catch *J*⁷) depressed.

The compound catch is operated as follows: The act of depressing the knob and lever *J* at the same time depresses the end of lever *J*³, the opposite ends of which in turn acts against the small one *J*⁶, whose outward end it forces downward carrying with it the catch *J*⁴. While the catch *J*⁴ is falling *J*⁷ is rising and protrudes between the front arm and the ones behind it, as seen in Fig. 2; thus holding back the arm or arms which are behind the front one. When the catch *J*⁴ is fully depressed, the first or front arm is released and flies around to the left, while the remaining arms are held back by *J*⁷. When the pressure is taken off the operating-knob *J* all the parts assume their original position, the releasing-catch *J*⁴ immediately rising, and the arresting-catch *J*⁷ falling. After *J*⁷ has entirely fallen, the arms, which it before held back, advance until the foremost one is in contact with *J*⁴, which checks them. By this movement the second arm has escaped the control of *J*⁷, and when *J*⁴ is again depressed the second arm will be released and fly around to the left, while the remaining ones will be held by *J*⁷ until the operation is repeated.

Another form of catch is shown in Figs. 23, 24, and 25, which are a front elevation, plan and end elevation, respectively, of the working-parts thereof. Here the operating-lever *J*⁹ is attached to a rock-shaft, *J*⁹, on the end of which is secured a double-armed lever, *J*¹⁰, Fig. 25, whose ends are connected by links *J*¹¹ to two levers of the third order, *J*¹² and *J*¹³, the ends of which levers form the catches and are so arranged that by depressing the lever *J*⁹ the shaft *J*⁹ is partially rotated and with it the double-armed lever, which in its turn causes a corresponding motion of the catch-levers *J*¹² and *J*¹³, depressing one and elevating the other, the effect being the same as in the preceding form. On the rock-shaft *J*⁹ is placed a spiral spring tending to keep it in one position, as seen in Figs. 23 and 24.

As previously stated, the catch may be

operated by the knee or foot, when found more convenient, by a suitable connection, such as a wire, rod, cord or pedal; and where any number of these instruments are used, such as in a band, orchestra, or choir, they may all be connected together and operated by one person either by manual force or by electricity.

16, Figs. 1 and 2, represents small elastic buffers on the base against which the arms strike as they fly around to the left, which receive the shock and prevent noise; these may also be placed on any other parts of the mechanism found necessary.

The apparatus can be furnished with any number of arms, limited only by convenient size; and, for greater portability, the arms may be made to expand and contract in length, on the principle of telescopic tubes, or otherwise. For turning back the arms and leaves, a tassel, *x*, Fig. 1, is attached to the arms to be easily operated by the performer's hand, or by cords or wires *y*, Fig. 1, attached to the drums, or by a rack acting on teeth on the drums, having cords or wires attached and operated by the hand, knee, or foot of the performer.

The operation of my improved leaf-turner is as follows: First, pressing the lower part of the center stave *B*, Fig. 1, backward, and placing the book or sheets of music in front of the same, so that the center pin *H*² fits into the center or fold of the book or sheets, the center of the lower edge of the same resting on the guide *H* which raises the leaves a short distance above the upper ledge of the base, by which they are prevented from dragging thereon when being turned; in this position the center and lower part of the book will be securely held by the stave, which is pressed tightly forward by the spring *H*³ against the pin *H*² in front. The sliding arm *C G*, Fig. 1, which carries the pin *D* for fastening the top and center of the book to the apparatus, is now adjusted to the proper height to suit that of the book; the pin *D*, which moves freely in the sleeve *h*, is next lifted and the top of the book pressed back behind it, and after adjusting the pin outward the proper distance from the stave, to suit the thickness of the book, it is dropped down in front of the same and pressed into the fold or center thereof, in which position the pin will be retained by tightening the binding-screw *g*. The book or leaves having been thus secured to the apparatus those leaves not to be operated upon are fastened back by the catch or catches *K*, while the ones intended to be turned are secured to the arms by placing one of the fingers behind and one of the vacuum-checks before each leaf;

or if the spring-clamps be used, placing the leaf between the jaws of the same, and turning each arm, with its leaf attached, to the right, where the ends of the arms passing under the little guide-plate *k*, Figs. 1 and 2, which prevent those ends rising, come in contact with the inclined face of catch *J*⁴, depress and pass over it, the catch retaining them in this position until released by pressing on the knob *J*. By depressing the knob one arm is released at a time, as before explained, and revolves half a revolution to the left with its leaf attached, thus presenting the opposite side of the leaf to the view of the operator. After all the arms are turned the leaves are detached from them and another series can be connected and the operation repeated.

A modified form of this apparatus can be attached to books to be held in the hand while reading, singing, lecturing, &c., and the catch operated by the finger on the same hand in which it is held.

The jaws *L* may be improved by having finger-nibs *L'*, as shown in front and side elevation in Figs. 20 and 22.

What I claim as my invention is—

1. The case *I*² containing the series of spring-impelled drums *I*¹, in combination with the radial arms *I* constructed to work in the same horizontal plane and provided with the fingers or clamps *I*², all arranged to operate substantially as described.

2. In combination with the arms *I*, the flexible helical fingers *I*² and vacuum-checks *I*³ or their equivalents, substantially as shown and described.

3. The releasing-catch *J*, constructed of a series of compound levers, *J*¹ *J*³ *J*⁶, and catches *J*⁴ and *J*⁷ or their equivalents, arranged and operating substantially in the manner and for the purpose set forth.

4. The combination of the stave *B*¹ and center pin *H*², adjustable in relation to each other by means of the spring *H*³ or its equivalent, and arm *C G* with its attachments, substantially as and for the purposes herein specified.

5. In a music-leaf turner, the catch *K* pivoted to the slotted plate and acted upon by a spring, as described, for the purpose of holding the leaves, substantially in the manner set forth.

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