

(No Model.)

3 Sheets—Sheet 1.

W. KERSHAW.
APPARATUS FOR TURNING OVER THE LEAVES OF MUSIC.
No. 465,324.
Patented Dec. 15, 1891.

Fig. 1

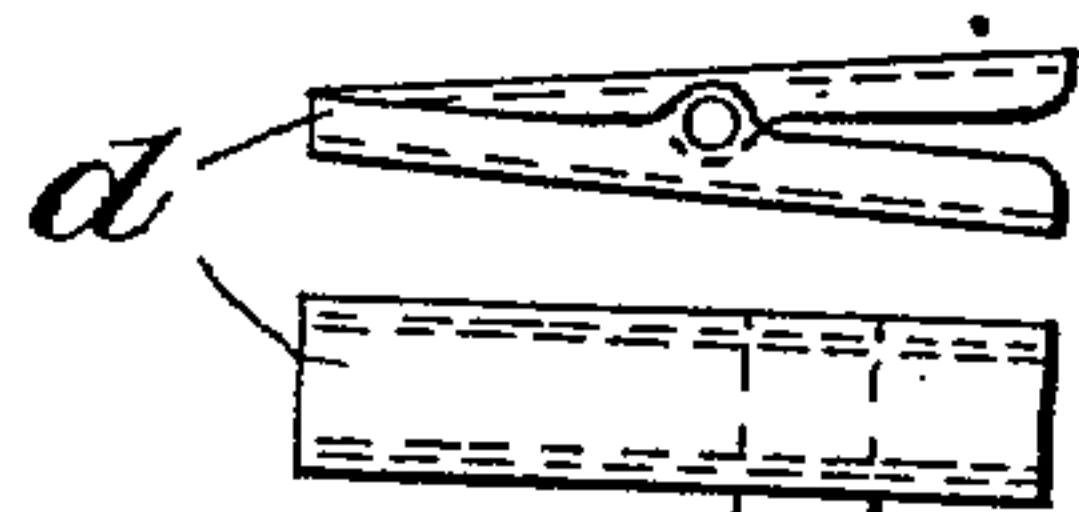
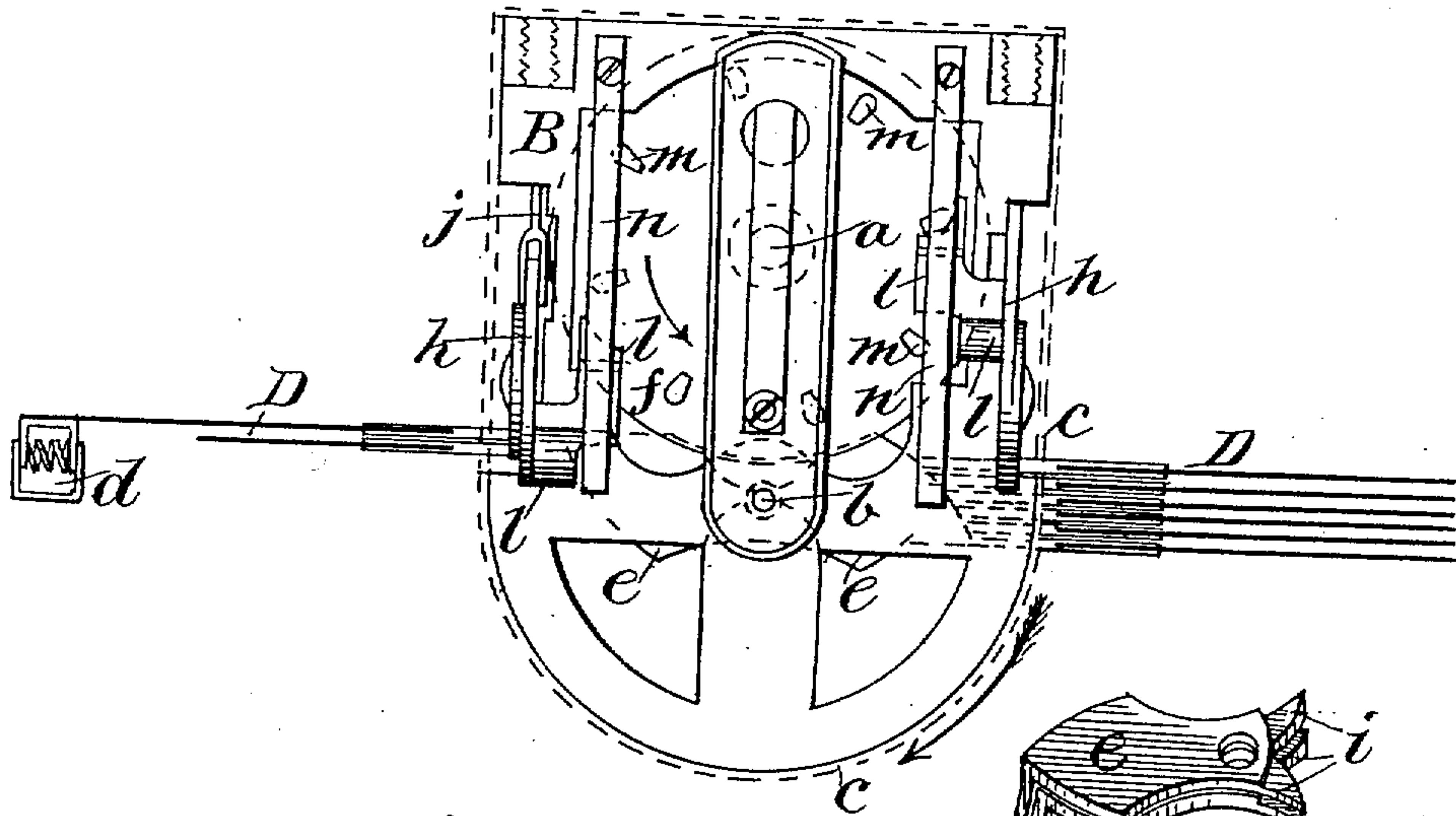


Fig. 2.

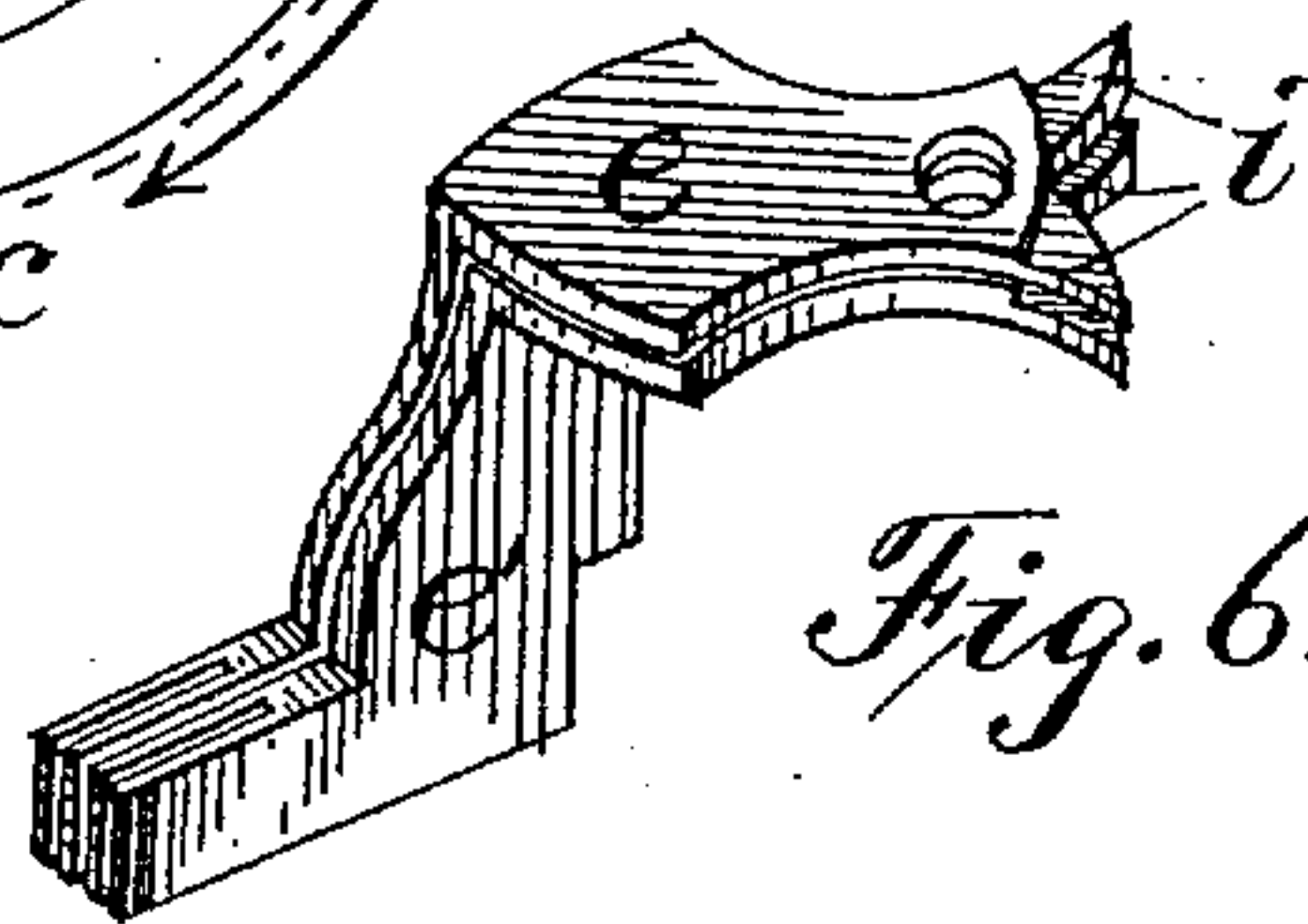


Fig. 6.

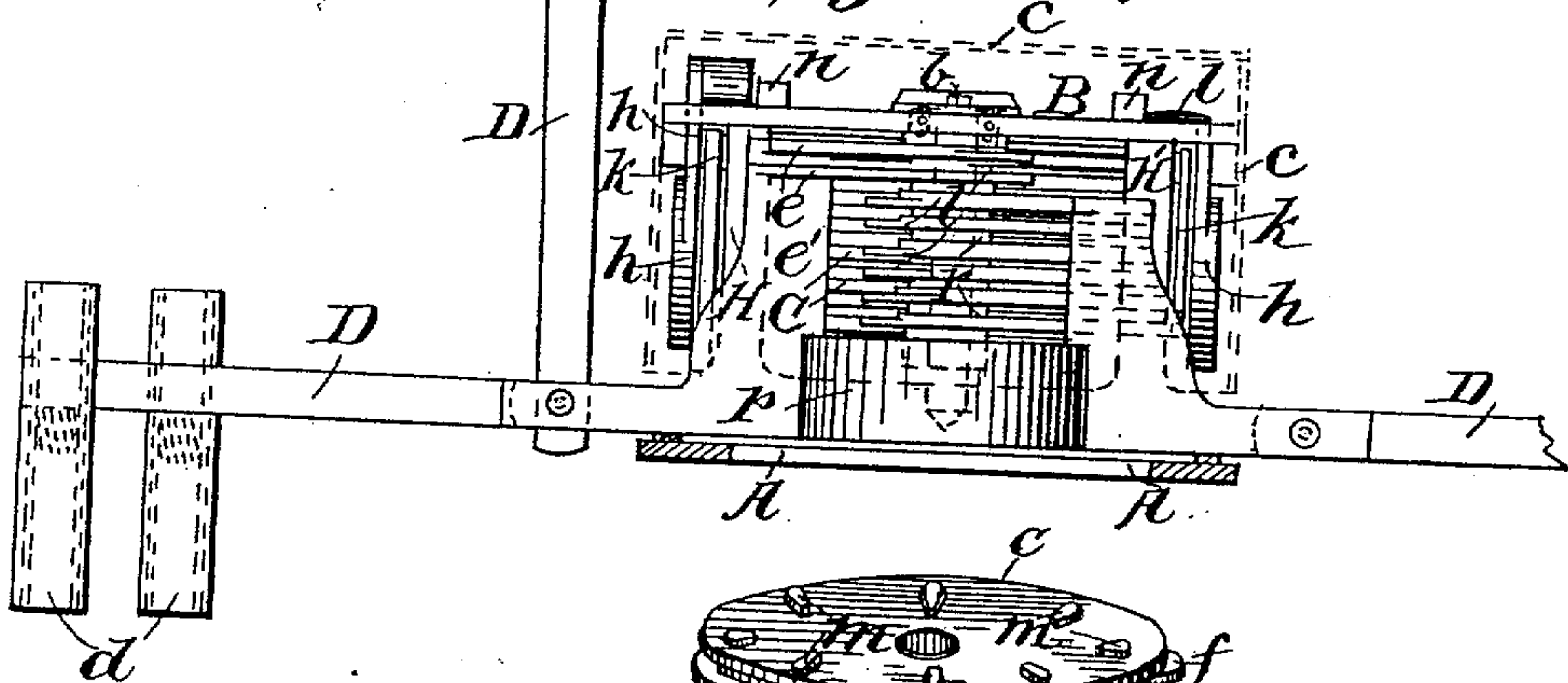


Fig. 7.

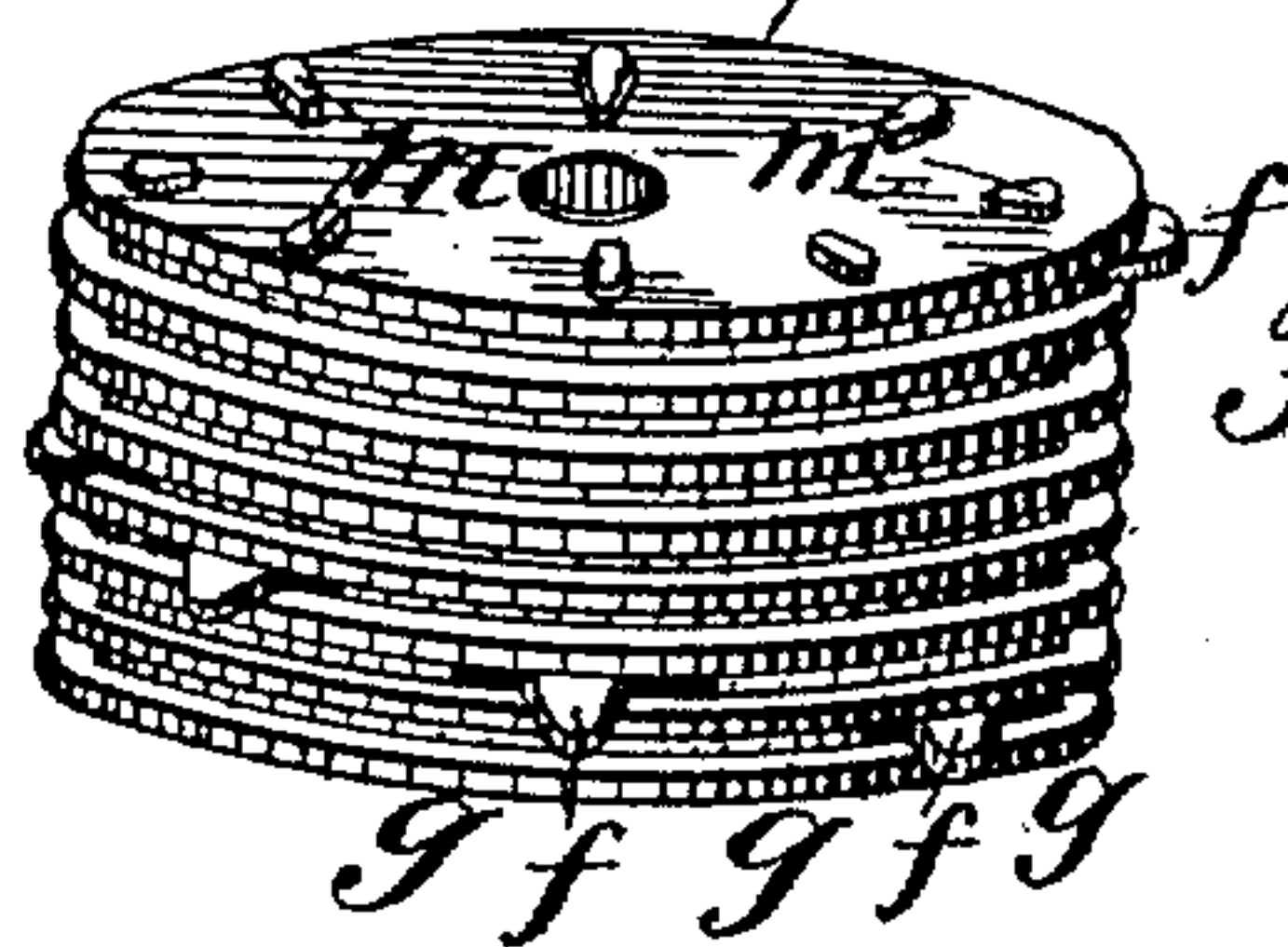


Fig. 9.

Fig. 8.
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Inventor.
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Atty.

(No Model.)

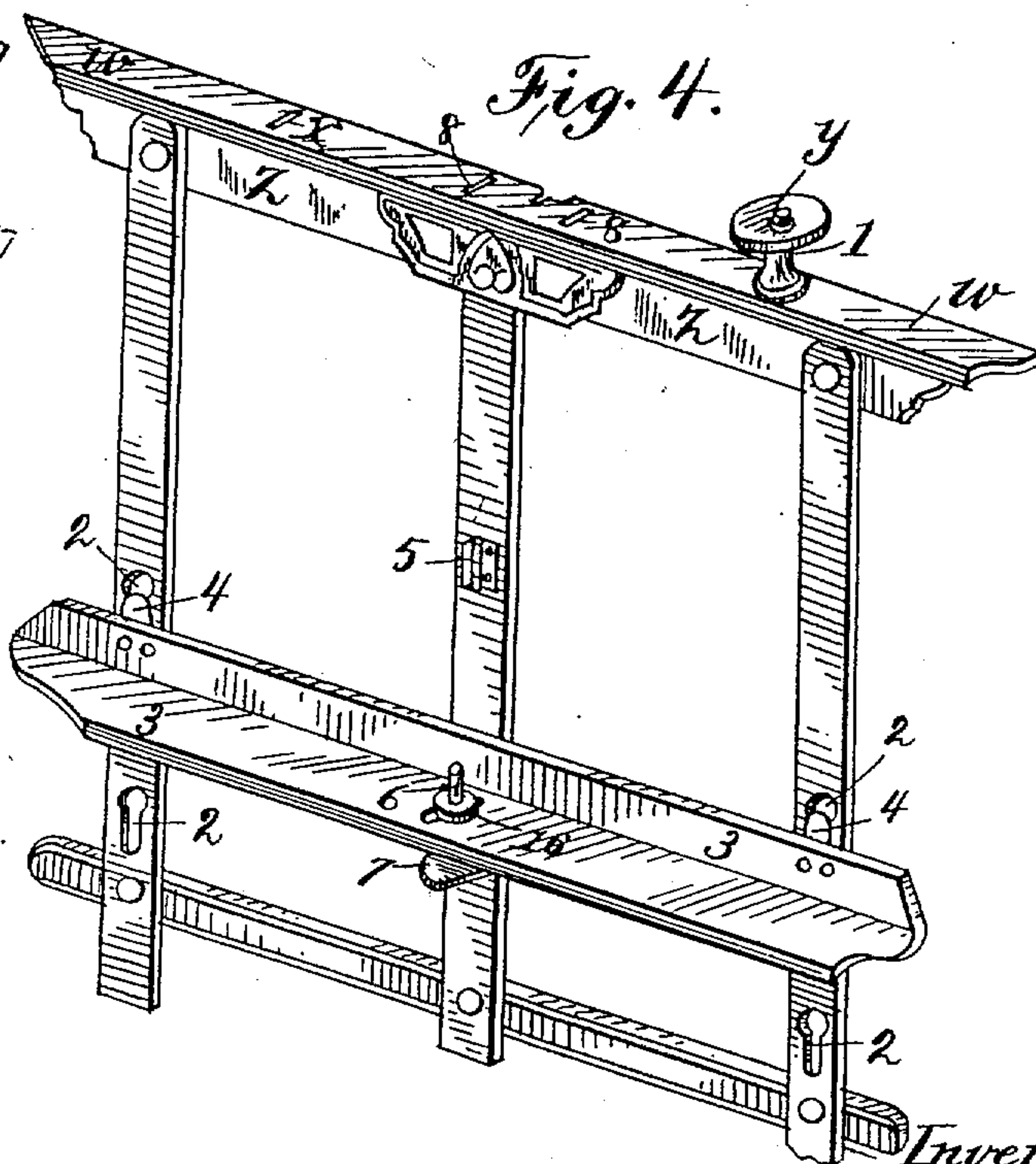
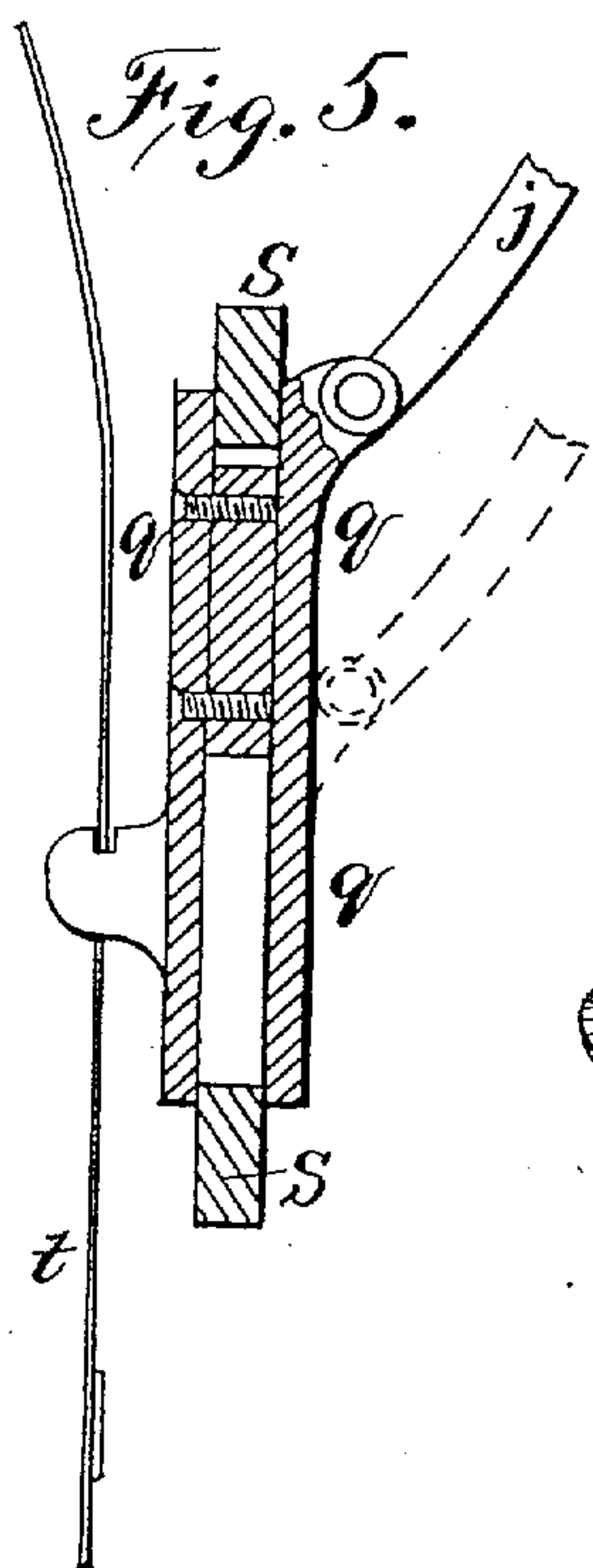
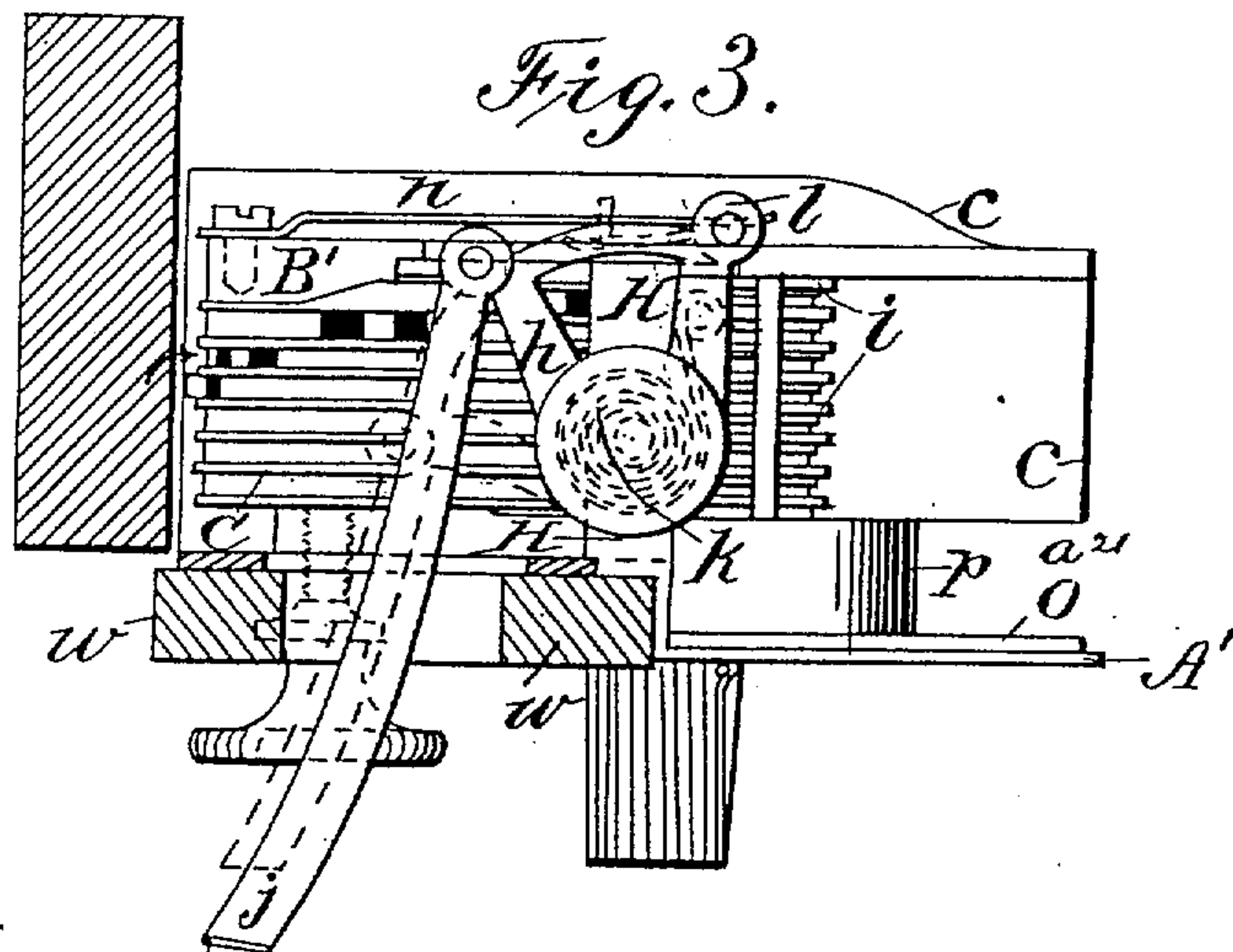
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APPARATUS FOR TURNING OVER THE LEAVES OF MUSIC.

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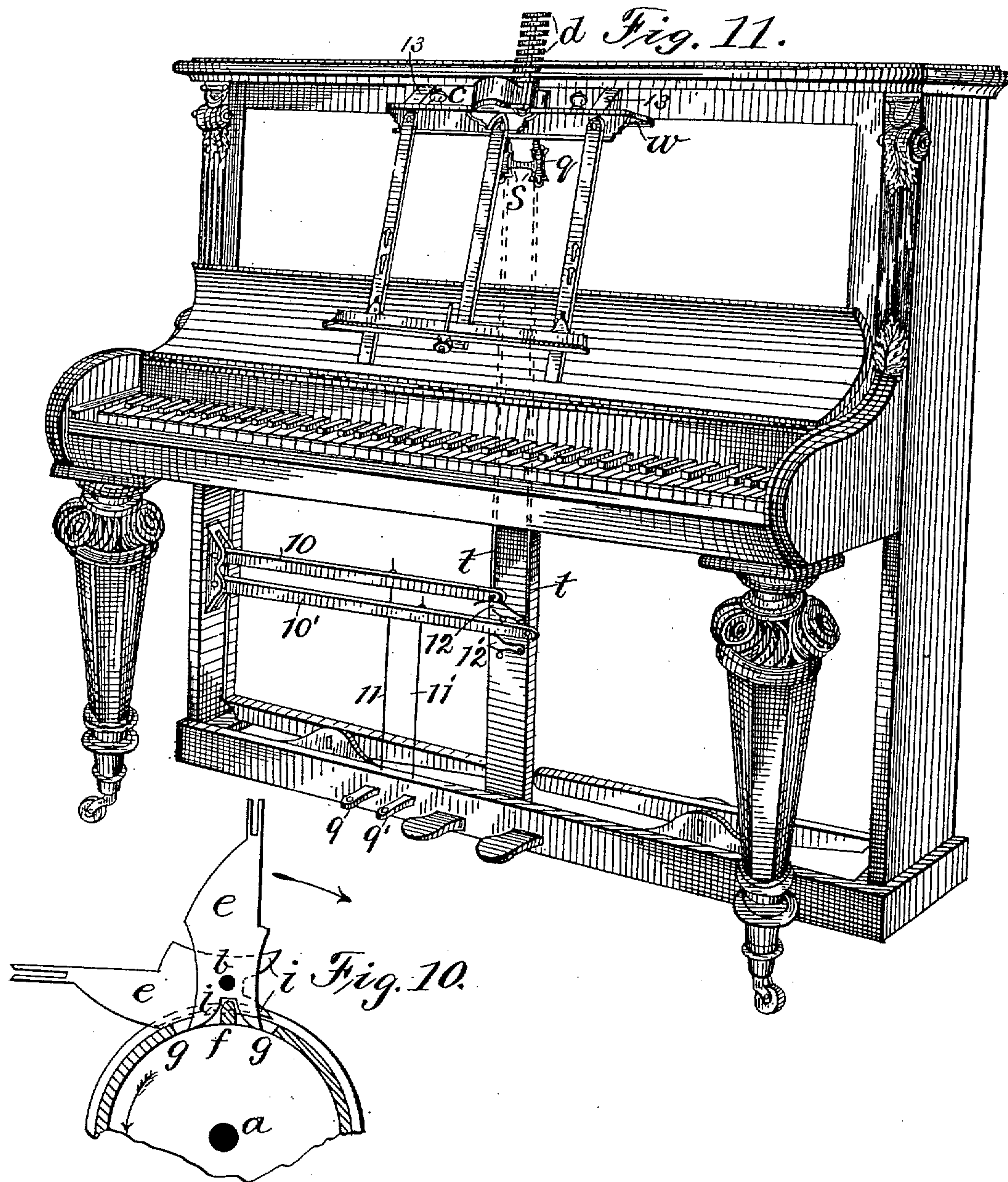
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APPARATUS FOR TURNING OVER THE LEAVES OF MUSIC.

No. 465,324.

Patented Dec. 15, 1891.



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UNITED STATES PATENT OFFICE.

WILLIAM KERSHAW, OF LEEDS, ENGLAND.

APPARATUS FOR TURNING OVER THE LEAVES OF MUSIC.

SPECIFICATION forming part of Letters Patent No. 465,324, dated December 15, 1891.

Application filed June 20, 1888. Serial No. 294,172. (No model.) Patented in England June 22, 1888, No. 9,110; in Germany March 27, 1889, No. 6,869; in France March 28, 1889, No. 197,059, and in Belgium March 28, 1889, No. 85,584.

To all whom it may concern:

Be it known that I, WILLIAM KERSHAW, a subject of the Queen of Great Britain and Ireland, residing at Leeds, in the county of York, England, have invented a new and Improved Apparatus for Turning Over the Leaves or Pages of Music, (for which Letters Patent have been granted to me in England, bearing date June 22, 1888, No. 9,110; in France, bearing date March 28, 1889, No. 197,059; in Belgium bearing date March 28, 1889, No. 85,584, and in Germany bearing date March 27, 1889, No. 6,869,) of which the following is a specification.

My invention relates to apparatus or mechanism for turning over the leaves or pages of music when placed on the music-rack, such apparatus or mechanism being operated by the foot of the player, the object being to avoid any break or interruption of time when playing, since the hands are not then required to be lifted from the key-board or instrument.

My invention includes the apparatus itself, the means for attaching it to the rack, the adjustment of the rack for different-sized sheets and different thicknesses of music-books, and, lastly, the means by which the apparatus is connected to or operated from foot-pedals specially provided for the purpose.

The apparatus is applicable not only for pianos and organs, but also to music-stands or rests used with other instruments.

The apparatus and the rack adjustments and connections to the pedals are illustrated by the accompanying drawings, in which—

Figure 1 is a plan, looking on the top; Fig. 2, a front end elevation of the apparatus, the cover or casing being represented, however, by dotted lines only in both Figs. 1 and 2. Fig. 3 is a side elevation of the apparatus, a section of the casing or cover being shown by a full black line. Fig. 4 is a front view showing the rack adjustments. Fig. 5 is a section of the piano-panel slide. Fig. 6 is a perspective view of two of the pivot-plates, and Fig. 7 is a perspective view of the barrel. Figs. 8 and 9 are side elevation and plan of one of the hinged pawls. Fig. 10 is a horizontal section of part of the barrel, showing the manner in which the pivot-plates engage with the teeth and recesses in the barrel; and

Fig. 11 is a perspective view of a piano fitted with my improved apparatus, and in which view the front of the lower part of the piano-case is supposed removed, so as to expose the pedal and lever attachments.

The same letters and figures refer to the same parts in all the views.

A is the base-piece, and B the top or cap piece, of the apparatus, both having holes or sockets for the ends of the barrel-axis $a a$ and the axis or pivot $b b$ of the pivot-plates $e e'$.

H H' are two uprights connecting the plates A and B, and are preferably cast with the base-plate A.

c is the outer cover or casing of the apparatus, which reaches down to and covers the back raised part of the base-plate A, but leaves the gap a^{21} at the semicircular front part of the cover, between it and the lower part A' of the base-plate, to allow of the motion of the arms D.

Lugs, as shown at B', Fig. 3, may be provided, into which holding-screws can be inserted for securing the casing c in position.

The radial arms D, of which eight are shown in the drawings, (though the apparatus may be arranged with more or less,) are of successively greater length, counting from the first, and carry at their ends spring-clips d , these being slipped over and securely gripping the upper edges of the leaves of the music. The inner ends of the arms D are hinged to the pivot-plates $e e'$, Fig. 2, so that they can all be raised into a vertical position out of the way when not required for use. (See Fig. 11.)

The pivot-plates, of which two are shown in perspective in Fig. 6, are bent so as to have horizontal and vertical parts, (lettered, respectively, e and e' .) The vertical parts e' are of successively decreasing height by an amount slightly greater than the thickness of the horizontal portion e , and the horizontal portions at their outer ends likewise successively decrease in width by an amount slightly greater than the thickness of the vertical part e' , counting from the first. The side edges of each horizontal piece e are curved, the radius of such curvature being the same as the radius of the recessed portions of the barrel C, so that when an arm D is in one or the other of its extreme positions to the right or left the

side edge next the barrel C fits against the outside of the barrel in the bottom of the corresponding groove or recess. The inner end of each horizontal piece *e* is formed with two
 5 tongues or horns *i*, leaving a recess between the same. Each of the horizontal pieces *e* is provided with a hole, through which passes the common pivot or axis *b b*.

The barrel C is shown separately in perspective in Fig. 7, and is constructed with recesses and flanges, so as to insure the proper fitting or working of the horizontal parts *e* of the pivot-plates and the tongues or horns *i* thereon, with the corresponding teeth or recesses on the outside of the barrel.
 15

The barrel C is provided (in the case shown) with eight teeth *f*, arranged at varying heights on the outside of the barrel, corresponding with the heights of the sixteen tongues or
 20 horns *i* of the eight pivot-plates and placed successively round the circumference of the barrel at angular distances of forty-five degrees apart. If the apparatus were arranged with ten radial arms D, there would be ten
 25 teeth *f* to correspond and the angular distances apart would be thirty-six degrees. On both sides, and in the same horizontal line with and close to each tooth *f*, slots or recesses *g* are left in the outside of the barrel C, into
 30 which the tongues or horns *i* of the horizontal pieces *e* enter or engage as the tooth *f* engages in the recess formed between the tongues or horns *i*, Fig. 10. It will be evident that as the barrel C is successively rotated through
 35 angles of forty-five degrees the pivot-plates *e e'*, and therefore the arms D, will be successively rotated through an angle of one hundred and eighty degrees, turning over in one direction or the other—i. e., forward or back-
 40 ward—the leaves attached to them. This arrangement of barrel C and pivot-plates *e e'*, it will also be evident, may be regarded as a modification of the well-known "Geneva stop" mechanism of watches.

In order to rotate the barrel C successively through angles of forty-five degrees, (in the case illustrated,) I provide the following mechanism: On the top of the barrel are provided eight projecting pin-teeth *m*, set at equal angular distances (forty-five degrees) apart. (If the apparatus were provided with ten radial arms D, then ten pin-teeth *m*, set at angular distances of thirty-six degrees apart, would be required.) A bell-crank lever *h* is provided
 55 on each side of the barrel C and can be drawn downward into the position indicated by dotted lines in Fig. 3 by means of the link-plates *j*, operated, as hereinafter described, from foot-levers. A coiled spiral spring *k* serves to
 60 draw back its respective bell-crank lever *h* to its original position. A hinged pawl *l*, attached to the front arm of each bell-crank lever, engages, on the bell-crank lever being moved from the foot-lever, with one of the
 65 pin-teeth *m*, and thereby moves the barrel C through an angle of forty-five degrees. It will be seen that as the bell-crank levers *h*

are placed at opposite sides of the barrel C the motion of one of the bell-crank levers will rotate the barrel in an opposite direction
 70 to that caused by the motion of the other bell-crank lever, so that, for example, the motion of the left-hand bell-crank lever will turn over the pages of music backward, while the motion of the right-hand bell-crank lever
 75 will turn over the pages forward. As the forward motion is that most frequently required, the right-hand bell-crank lever *h* is connected with the right-hand foot-pedal—i. e., the one nearest the player. The pawls *l*,
 80 being hinged, can lift or ride over the pin-teeth *m* when drawn back by the springs *k*, but are pressed down, so as to engage with the same teeth (when the bell-crank lever is actuated from the pedal) by means of the
 85 flat springs *n*.

In order to give sufficient support to the arms D, which is necessary, owing to the slight or narrow bearing which the pivot-plates *e e'* have on their common axis *b b*, and also to
 90 prevent undue friction between the pivot-plates themselves, I provide a semicircular race or support *o*, on which the outer horizontal under edge of the pivot-plate arms slide, and a semi-cylindrical guide *p* for the
 95 lower inner vertical edge of the pivot-plates, and, lastly, loose washers *r*, fitting over the pivot-plate axis *b* between the horizontal parts of the pivot-plates *e*.

In order to actuate the apparatus from the
 100 special foot-pedals 9 9', Fig. 11, I make use of the following means or mechanism. Each link-plate *j* is connected to a sliding piece *q*, (shown in cross-section in Fig. 5,) which fits, capable of sliding, in a slotted guide *s*, fixed
 105 in the piano panel or front immediately behind the music-rack, Fig. 11. Each of the sliding pieces *q* has a projection on its inner face that passes through a slot formed in each of the two steel bands *t*, so that the latter may
 110 be readily detached when it is desired to take out the piano-front for tuning, &c. One of the steel bands *t* is secured to the outer end of a one-armed spring-balanced lever 10 and the other to a similar lever 10', both levers
 115 being preferably fulcrumed to the left-hand side of the piano. The lever 10 is connected by wire or rod 11 to foot-pedal 9, and the lever 10' is similarly connected by wire or rod 11' to foot-pedal 9'. The steel bands *t* are
 120 twisted at right angles before reaching the key-board levers, so as to readily pass between the levers.

In order to allow music-books of various thickness and height being operated by the
 125 apparatus, which is clamped by a milled headed screw in one fixed position to the upper cross-board *w* of the music-rack, I make the music-rack adjustable by the following means: The upper cross-board *w* is loose or,
 130 rather, separate from the upper cross-bar *z* of the music-desk frame and is provided with two slot-holes *x*, through which pass screwed studs *y*, permanently fixed to the upper cross-

bar *z* of music-desk frame. A milled headed nut 1 secures the upper cross-board *w* to the upper cross-bar *z*, or, more strictly, the latter to the former, in any position within the limits allowed by the slot-holes *x* to which it may have been adjusted. The cross-board *w* is permanently attached to the top of the piano-front by means of brackets or hinges 13, Fig. 11. The above adjustment allows of books of varying thickness being conveniently operated by the apparatus. The slot-holes 2 in the outer uprights, enlarged at their upper ends, allow the music-rest 3 to be adjusted to two or more heights, according to the number of such holes provided therefor. The music-rest 3 is carried in such slots by pins 4, which just fit the narrow part of the slots, but which are provided with heads which are so large as just to pass through the enlarged parts of the holes 2. The slots 8 are to allow passage for the links *j*, and the recess or slit between these slots is for admitting the stud of the apparatus, which is secured to the upper cross-board *w* by the large milled headed nut or screw, as shown in Fig. 3.

I find it advisable, owing to the bending of the leaves at the middle, to set the middle edge of the music a little to the left of the center line of the apparatus or desk, and for this purpose I provide a hinge-setting stop 5, which can be turned down when once the music has been adjusted and the leaves attached to the clips *d*. In order to keep the lower middle edge of the music in position when the leaves are being turned over, I provide a stud or pin 6, which can be fixed at any position in the slot in the music-rest by means of the milled headed nut 7 on the under side. To this end the stud has a fixed collar 16, (shown in Fig. 4,) and having a bearing on the upper face of the music-rest, while the milled head 7 on the screw-stud has a bearing on the under surface of said music-rest.

The mode of operating my invention is as follows: The music-book is placed on the rest, the latter being adjusted in the slots 2 for height and the studs *y* in the slots *x* for thickness. The pin 6 is then placed in front of the first or second page to be turned over close to the middle crease of the book or sheets. The leaves or pages are then successively connected to the clips *d*, the arms *D* being turned down successively into a horizontal position for the purpose. The foot-pedal 9' is then depressed, which causes the depression of the right-hand bell-crank lever, the rotation of the barrel *C* in the direction indicated by the arrow in Fig. 1 through forty-five degrees and the top pivot-plate and the first shortest arm *D* through one hundred and eighty degrees in the direction also shown by the arrow in Fig. 1, and thereby the turning over of the first page. On raising the foot from the pedal the spring

12' raises the lever 10', pedal 9', and steel band, and the spring attached to the bell-crank lever raises the latter to its normal position, ready to be again pulled forward and downward when the pedal is next again depressed. The successive depression of the pedal 9' successively rotates the other arms in exactly the same manner. The depression of the pedal 9 depresses the left-hand bell-crank lever, causing a reverse motion of the barrel *C* and the arms *D* to that just described, thereby turning back the pages or leaves.

I am well aware that prior to this my invention intermittently-rotated arms and also barrels or cylinders have been used for the purpose of turning over the leaves of music. I do not therefore claim their use broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of an intermittently-rotated barrel having teeth *m* on or at one of the circular ends and teeth *f* and recesses *g* on the outer cylindrical surface, with pivot-plates *e e'*, having tongues *i*, and a recess between the tongues at one end and curved sides or edges, all substantially as set forth and shown, and for the reasons and purposes specified.

2. The combination of the bell-crank levers *h*, having hinged pawls *l* and spiral springs *k*, with the barrel *C*, having teeth *m* on or at one end, and the pivot-plates having vertical and horizontal parts *e* and *e'*, all substantially as set forth.

3. The combination of pivot-plates having vertical and horizontal parts *e e'* and the hinged radial arms *D* of the barrel *C*, having teeth *m*, and means for imparting a step-by-step rotation to said barrel, substantially as set forth.

4. In a music-leaf turner, the bearing-race *o* and cylindrical guide *p*, substantially as shown, and for the purpose specified.

5. In a music-leaf turner, the combination of the links *j* with the sliding pieces *q* and guide *s*, substantially as set forth.

6. In a music-leaf turner, the combination, with the guide *s*, of the steel bands *t*, having slot-holes, and the spring-balanced levers, all substantially as set forth.

7. The combination of the above-described apparatus for turning over the leaves or pages of music with a music-rack having adjustable top cross-board *w*, adjustable rest 3, hinged setting-stop 5, and holding-pin 6, all substantially as set forth and shown, and for the purposes specified.

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