(No Model.) 3 Sheets—Sheet 1.

W. COATES.

APPARATUS FOR TURNING OVER LEAVES OF MUSIC OR OTHER BOOKS.

No. 522,336. Patented July 3, 1894.

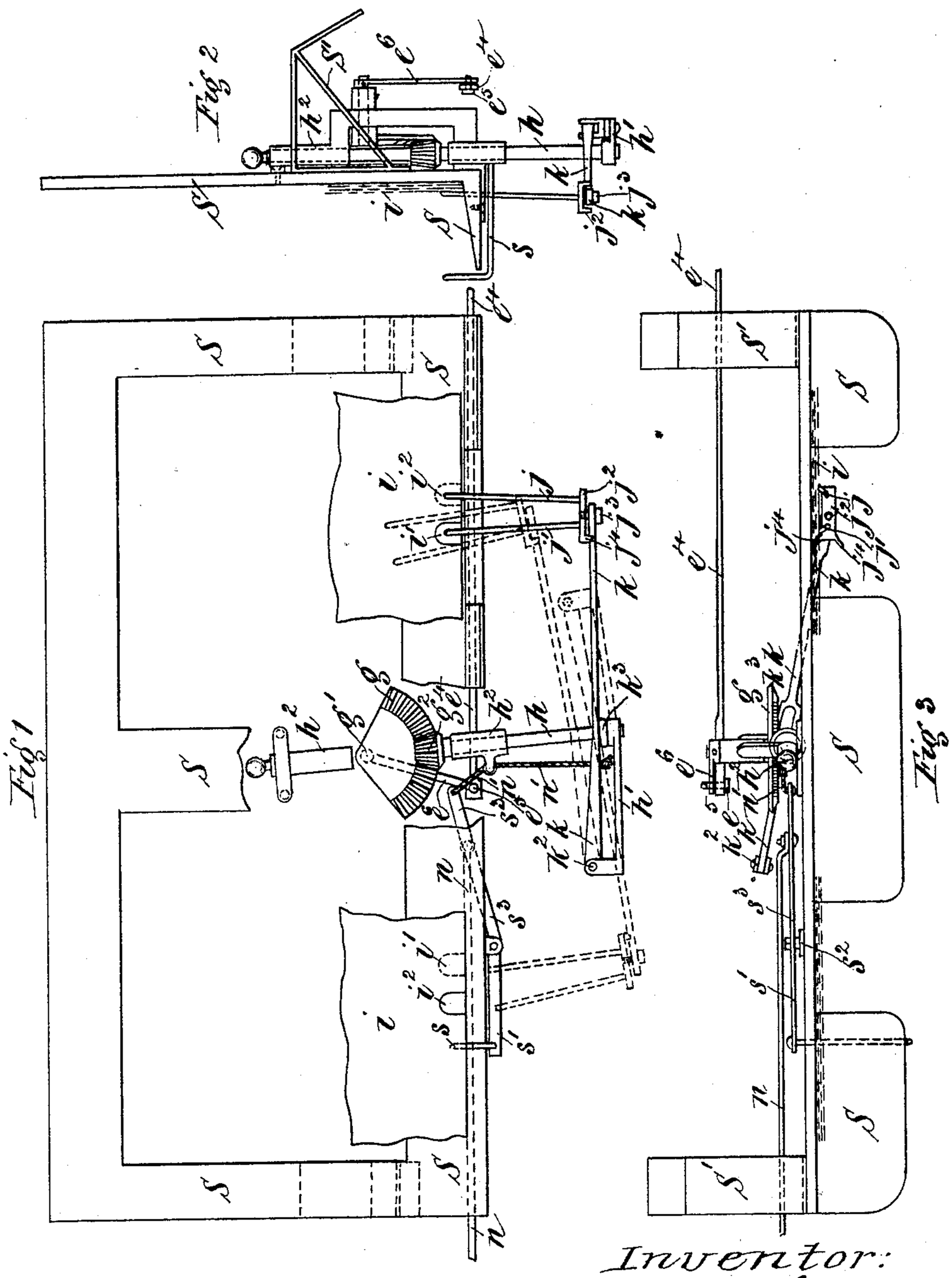


Fig. 1

Fig. 3

Witnesses:
E. B. Bolton
H. VanOldenneel

Inventor:
William Coates
By Richards Lee
His Attorneys.

(No Model.) 3 Sheets—Sheet 2.

W. COATES.

APPARATUS FOR TURNING OVER LEAVES OF MUSIC OR OTHER BOOKS.

No. 522,336. Patented July 3, 1894.

Fig. 5

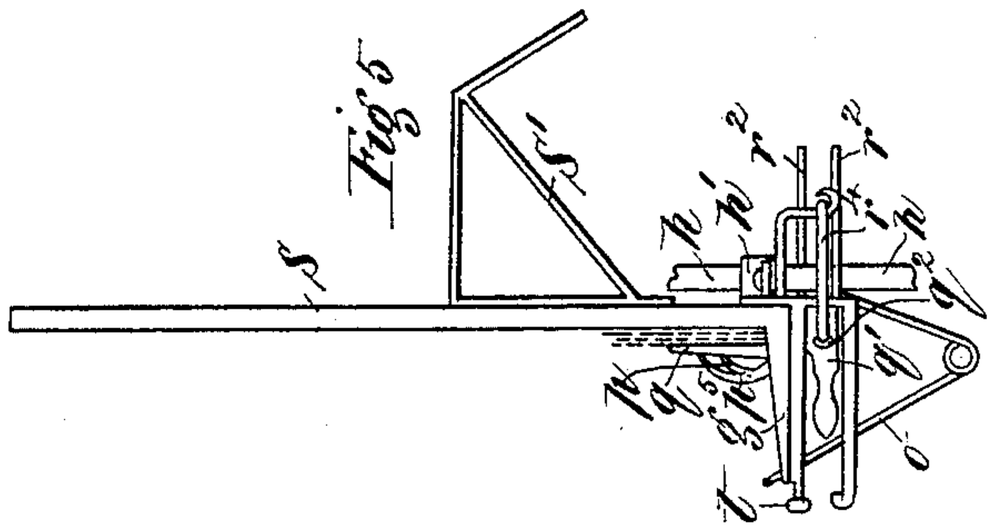


Fig. 4

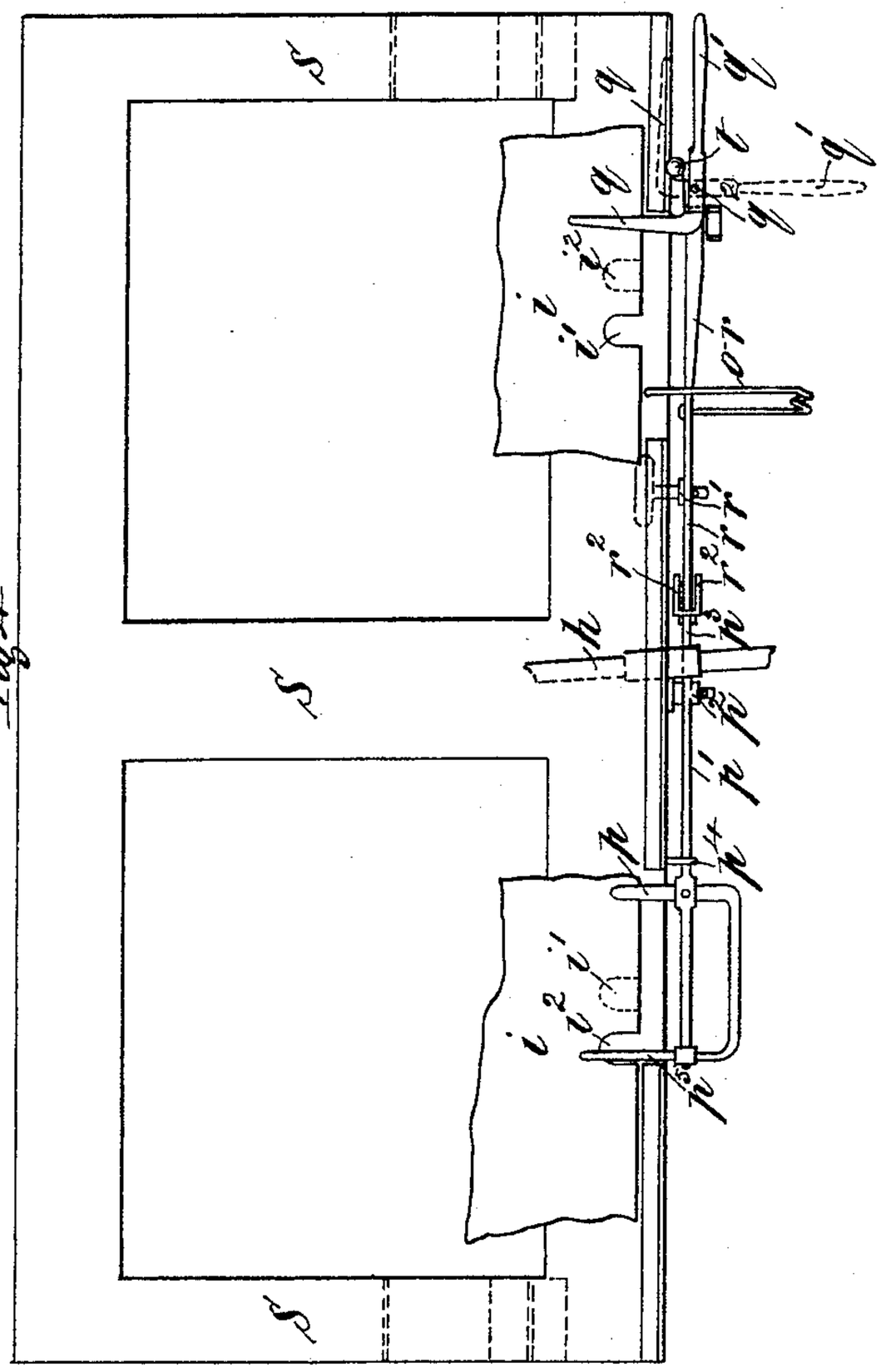
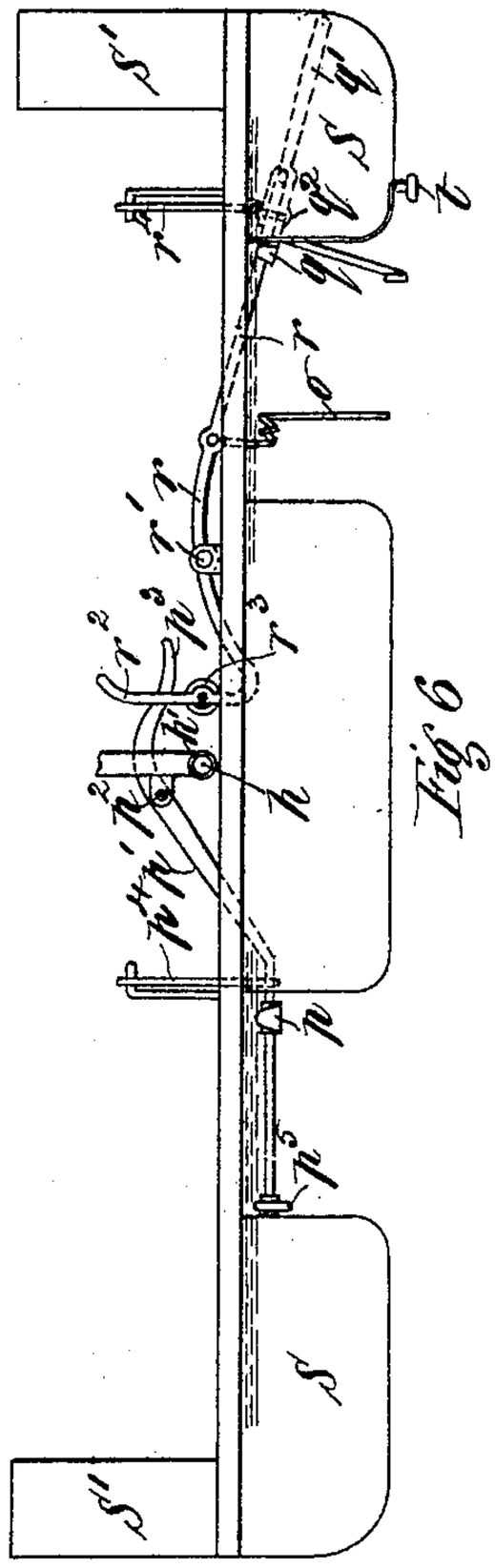


Fig. 6



Witnesses:
C. B. Batton
H. Van Oldenneel

Inventor:
William Coates
By Richards & Co
his Attorneys.

(No Model.) 3 Sheets—Sheet 3.

W. COATES.

APPARATUS FOR TURNING OVER LEAVES OF MUSIC OR OTHER BOOKS.

No. 522,336. Patented July 3, 1894.

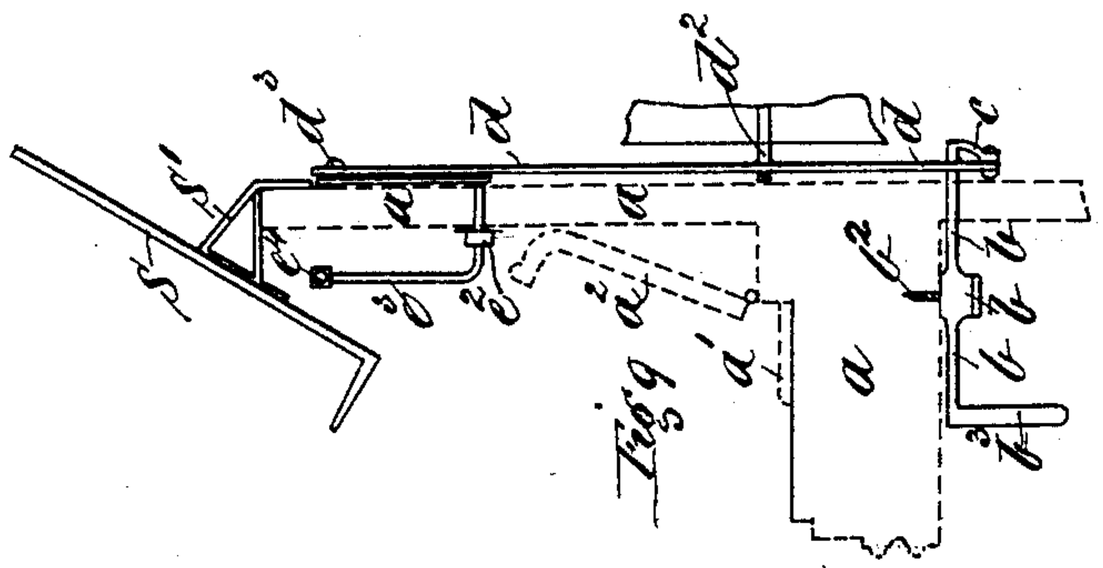


Fig. 6.

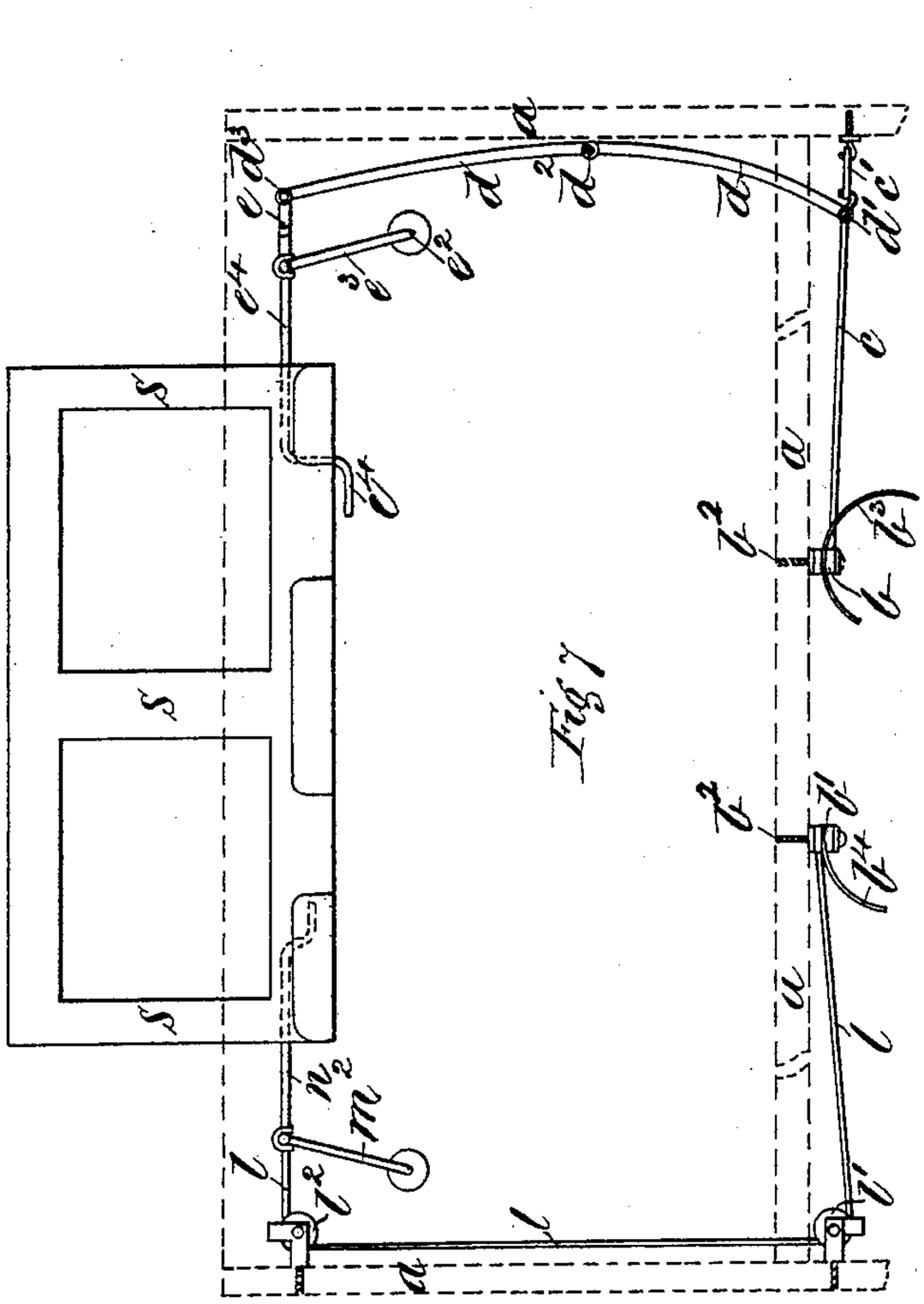


Fig. 7.

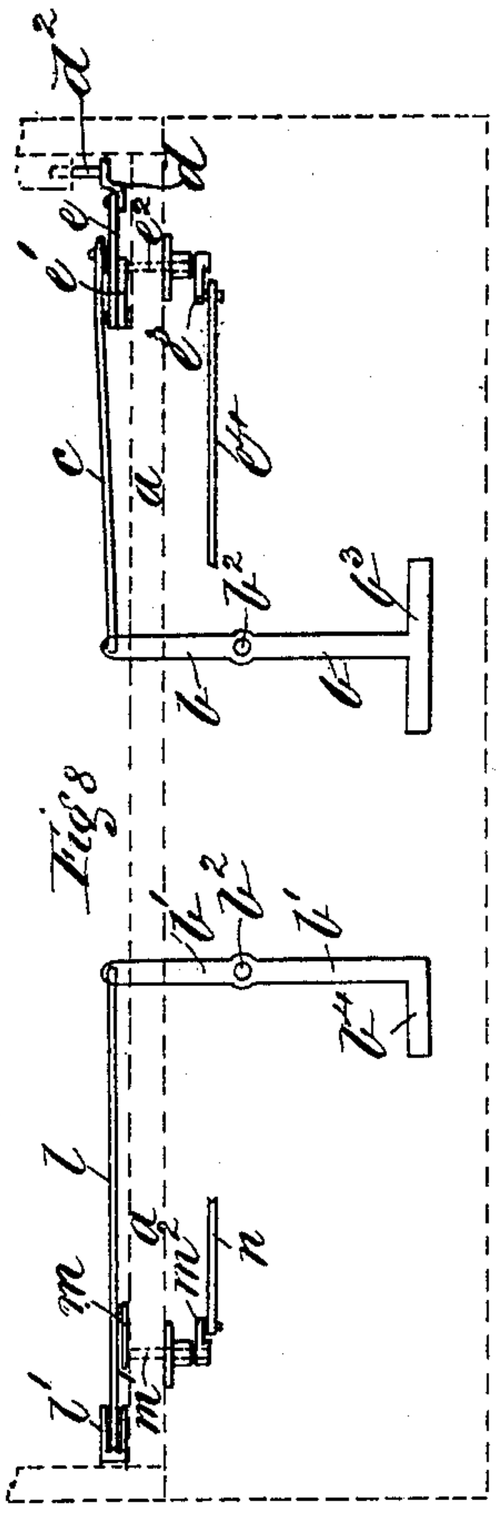


Fig. 8.

Witnesses:
C. B. Bolton
H. van Oldenneel

Inventor:
William Coates
By Richards & Co
his Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM COATES, OF WELLINGTON, NEW ZEALAND.

APPARATUS FOR TURNING OVER LEAVES OF MUSIC OR OTHER BOOKS.

SPECIFICATION forming part of Letters Patent No. 522,336, dated July 3, 1894.

Application filed January 9, 1894. Serial No. 496,301. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM COATES, a subject of the Queen of Great Britain, residing at Wellington, in the Colony of New Zealand, have invented new and useful Improvements in Apparatus for Turning Over the Leaves of Music or other Books, of which the following is a specification.

My invention relates to a new method of and apparatus for turning over the leaves of music and other books more especially when the hands of the operator are otherwise engaged and has for its objects performing the operation in a simple and efficient manner by machinery which is certain in its action and convenient to operate.

In order that my invention may be readily understood by one skilled in the art to which it appertains I will proceed to describe the same and for that purpose shall refer to the accompanying sheet of drawings which represent my apparatus as applied to turning the leaves of an ordinary music book on a piano.

Figure 1 is a front view of my apparatus for turning the leaves as fitted to the music rest of an ordinary piano. Fig. 2 is an end view of the same. Fig. 3 is a plan of the same. Fig. 4 is a front view of my apparatus for holding the book as fitted to the music rest of an ordinary piano. Fig. 5 is an end view of the same. Fig. 6 is a plan of the same. Fig. 7 is a front view of the fittings for attachment to an ordinary piano. Fig. 8 is a plan of the same. Fig. 9 is an end view of the same.

Similar letters refer to similar parts in all the figures.

(*a*), &c., show the ordinary frame work of a piano (*a'*) showing the position of the keys and (a^2) the ordinary lid or cover.

(*b*) and (*b'*) are levers oscillating on screws or pivots (b^2) attached (by preference) underneath the body of the piano.

The levers have attached to them brackets (b^3) and (b^4) placed in such a position and shaped in such a form that they can be easily worked by the knees of the operator. These brackets are (by preference) so formed that (b^3) can be moved either to the right or to the left by the action of the right knee and (b^4) to the left only by the action of the left knee.

To the outer end of the lever (*b*) is attached one end of a connecting rod (*c*) and its opposite end is attached to the frame of the piano by means of a hook and elastic spring (*c'*) as shown in Fig. 7.

To the connecting rod (*c*) is attached a vertical lever (*d*) by means of a joint (*d'*). This lever (*d*) oscillates on a pin (d^2) fixed in any convenient position (see Fig. 8) and its outer end is jointed to a rod (*e*) which oscillates with it and is itself steadied and supported by means of an oscillating upright support or lever (*e'*) fixed to a rocking spindle (e^2) passing through the front board of the piano to the outside and communicating its motion to another oscillating upright support (e^3). To the top of this support (e^3) is hinged a rod (e^4) which communicates motion to the lever (e^6) by means of the joint (e^5). The lever (e^6) oscillates the axle (*g'*) of the bevel wheel segment (*g*) and imparts an oscillating motion to the same upon the axle (*g'*). I have thus communicated the motion of the right knee of the operator to the bevel wheel (*g*) which it oscillates backward and forward causing the pinion (g^2) to revolve and in so doing carries with it the vertical spindle (*h*) which it also causes to revolve to the right or to the left in a half circle or thereabout.

(S) is the usual stand for music as fitted to ordinary pianos but which I prefer to make with brackets (S') so that it can be readily fastened by brackets to the front of the instrument as shown. The spindle (*h*) revolves or oscillates in bearings (h^2) fixed (by preference) behind the board (S) and has attached to it firmly an arm (*h'*) which therefore oscillates with it and usually in about a semicircle.

(*i*) is a portion of the leaf of a music book placed in a position open for use and which leaf it is the object of the apparatus to turn to the left. This leaf has a piece cut out of it as shown at (*i'*). A similar piece is punched out of every leaf required to be turned or referred to but it is cut out in such a manner that every alternate leaf has the vacant space in the position shown by dotted lines at (i^2).

(*j*) and (*j'*) are two small fingers or prongs which are so formed at their points that (*j*) rests on the upper page while (*j'*) rests on the page underneath in consequence of the recess (*i'*) being cut out of the said upper page. By an arrangement to be hereinafter described the prongs (*j*) and (*j'*) can be moved

into the position shown by the dotted lines on the page (*i*) so as to readily turn the said page.

In order that the prongs (*j*) and (*j'*) may rest properly on the page on which they are placed and in all circumstances, they are fixed into a plate (j^2) which oscillates slightly on a pin (j^3) and in such a manner that the side to which the prong (*j*) is attached may be slightly heavier than the other side. This plate (j^2) has projections (j^4) fitting over the connecting rod (*k*) and thus preventing the said plate from oscillating to too great a distance but at the same time allows of a limited motion on the pin (j^3).

(*k*) is a connecting rod which carries at one end the pin (j^3) and at its opposite end is jointed freely to the arm (*h'*); it is also fitted with a slot (k^3) passing over the revolving spindle (*h*) and thus confining it to the said spindle but allowing of free motion thereon.

It will thus be seen that a half turn of the pinion (g^2) will cause the spindle (*h*) to make half a turn and carry with it the arm (*h'*), the rod (*k*) and the prongs (*j*) and (*j'*) which will then sweep the leaf (*i*) in a semicircle from one side of the book to the other or vice versa in accordance with the action of the knee on the bracket (b^3) either to the right or to the left and for this purpose the gearing is so arranged that only a slight motion of the knee will effect it.

Having now described the apparatus in connection with the right knee on the bracket (b^3) in order to turn the leaves, I will proceed to describe the action of the left knee on the bracket (b^4). To this bracket (b^4) is attached a lever (*b'*) similar to the beforementioned lever (*b*) and to its outer end is fastened a cord or other connection (*l*) passing round the guide pulleys (*l'*) and (l^2) fixed (by preference) within the body of the piano and communicating with and giving an oscillating motion to the arm (*m*) fixed to a pin (*m'*) passing through the front board to the outside of the instrument and communicating its motion to an arm (m^2) which carries at its outer end a rod or connection (*n*) which transfers its motion to a cord (*n'*). This cord (*n'*) is passed through a hole in the arm (*k*) and knotted. By these means the rod (*k*) can be caused to move upward while an elastic spring attached to the rod (*n*) causes a return or downward motion of the same. In this manner an upward and downward motion is given to the arm (*k*) carrying with it the prongs (*j*) and (*j'*) and thus enabling the said prongs to take up the dotted position shown at their points in Fig. 1 so that one prong is slid under the leaf (*i*) and the other on the top of the same so as to grip the leaf in readiness for turning.

I find in practice that in the act of turning a leaf a partial vacuum is formed under the same and which prevents it being readily released from the page below. I obviate this difficulty by placing a light bracket (*o*) projecting upward and outward so that in the act of passing the prongs (*j*) and (*j'*) into position for turning the leaf the arm (*k*) is lifted slightly and carrying with it the prongs they are also lifted together with the leaf and thus air is admitted between the leaves before the actual turning takes place. This bracket (*o*) I prefer to make of light wire so that it may act as a spring and prevent jar or slam when struck by the arm (*k*) in turning back the leaves.

It is sometimes advisable to prevent the leaf blowing back after it has been turned to the left hand and therefore I place a hook (*s*) so that it may bend slightly over the turned page. The hook is attached to an arm (*s'*) oscillating on a pin (s^2) and connected with the rod (*n*) by the lever (s^3). By these means when the left knee is moved to the left so as to introduce the prongs in readiness to turn the leaf the hook (*s*) is depressed out of the way until the leaf is turned after which it returns and secures the leaf the action of the knee being removed.

It is of course necessary that the outside covers of leaves of the book should be held pretty firmly in position and I will now proceed to describe the method of holding the same and for the purpose I shall refer more especially to Figs. 4 and 5. Having placed the book open upon the stand in a central position I hold the left hand side of the book by the following apparatus.

(*p*) is a clip which is placed over the inside of the first leaf or cover of the book to hold it pretty firmly in its place, this clip is fixed to an arm (*p'*) oscillating on a pin (p^2) which is fixed to any convenient part of the book stand and has a tail piece (p^3). The arm and clip are pressed down by an elastic spring or band (p^4) placed in any convenient position. The arm (*p'*) has attached to it at its extreme outer end a projection (p^5) which is so formed that it holds the first leaf a little apart from the rest thus leaving a space which is of great assistance when inserting the prongs to bring the leaves back to the commencement if desired.

Should any leaf being the last leaf turned over require to be turned back again for the purpose of repeating it will be necessary to hold a slight strain upon the knee bracket (b^4) with the left knee to keep the prongs in position and also by the action of the right knee being worked to the left the leaf can be turned back again. By pressing on the tail piece (p^3) the book can be freed. I hold the right hand leaf or cover of the book by a projection (*q*) which is attached to a lever (*r*) oscillating on a pin (*r'*) and held down by an elastic spring or band (r^4). The said lever (*r*) is fitted (by preference) with a fork (r^2) and roller (r^3) so that on lifting the projection (*q*) by the lever (*r*) both the right and left hand levers are lifted and the right and left hand levers or covers of the book released.

I sometimes fasten the projecting holder

(q) to a handle (q′) oscillating on a pin (q^2) attached to the lever (r) and thus on depressing the said handle I can withdraw the holder (q) from holding the book and by passing the handle over a knob (t) I can effectually free both sides or covers of the same and retain them in that position.

It will be evident from this description that my apparatus as applied to pianos and similar instruments consists in applying the action of the knees to actuate machinery by which the leaves of books can be turned to the right hand or to the left or vice versa the said books having small notches cut in the leaves for the purpose of inserting the prong by which they are turned the book being held truly and firmly by machinery which can be readily brought into action or released.

The apparatus can be arranged for other purposes and instruments whether the operator is standing or sitting and can be worked either by the knees or feet and in some cases such as for bands or orchestras several sets of the apparatus may be attached to one another and worked together so as to turn over a number of books simultaneously.

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

1. In combination with the rod or arm k having prongs j and j′, connections for rocking said arm k, and means independent of the rocking connections for raising the arm to cause the prongs to engage the leaf to be turned, substantially as described.

2. In combination with the arm k with connections for rocking the same, a plate horizontally arranged upon said arm having a limited rotary movement, and prongs projecting upward from said plate for engaging the leaf to be turned, substantially as described.

3. In combination, with the rocking arm k carrying fingers and adapted to be raised to engage the leaf to be turned, a bearing bracket adapted to engage said arm k and throw it slightly outward whereby the leaf to be turned is slightly separated before the actual turning takes place, substantially as described.

4. In combination with the arm k having prongs for engaging the leaf, connections for positively operating said arm in either direction, a second arm above arm k having cord connection therewith, and means for rocking said supplemental arm to lift the prongs into engagement with the leaf to be turned, substantially as described.

5. In combination with the spindle h with means for rotating the same, the arm h′ carried thereby, the arm k having one end pivotally connected to the arm h′ and its other end provided with leaf engaging fingers and its intermediate portion connected with said spindle by a sliding joint, and means for raising the free end of said arm k to cause the fingers to engage the leaf to be turned, substantially as described.

6. In combination with the spindle h with means for rocking it in either direction, the arm h′ carried thereby, the arm k having its central portion slotted to receive said spindle and its rear end pivotally connected to said arm h′, fingers carried by the free end of the arm k, and means for sliding the slotted portion vertically upon the spindle to lift the fingers into engagement with the leaves, substantially as described.

7. In a leaf turner, the combination with the leaves to be turned having alternately arranged slots in their lower edges, the arm k with means for rocking it in either direction, the fingers carried by said rod and adapted to rest one upon the face of the leaf and one in the slot therein, and means for lifting the arm k to cause one of the fingers to pass beneath the sheet in the slot of which it rests, substantially as described.

8. The combination of lever (b) having knee bracket (b^3) or a pedal equivalent to the same with oscillating rod (c), lever (d), oscillating rod (e′), spindle (e^2), oscillating rod (e^3), and rod (e^4) lever (e^6), segment (g), pinion (g^2), spindle (h), arm (h′), arm (k), having prongs (j) and (j′) and book perforated as at (i′) and (i^2) as and for the purposes substantially as described herein and illustrated in the accompanying drawings.

9. The combination of rod (n), with lever (s^3), with cord (n′), arm (k), and prongs (j) and (j′) as and for the purposes substantially as described herein and illustrated in the accompanying drawings.

10. In a music leaf turner, the combination with the music of the pivoted levers p′ and r carrying cover holders at their outer ends and having their inner ends arranged in proximity whereby the operation of one serves to operate the other, substantially as described.

11. In a music leaf turner the combination with the music of the pivoted lever p′ and r carrying cover holders p and q at their outer ends and having their inner ends in proximity, and a roller r^3 journaled on the end of lever r and adapted to bear against the adjacent end of lever p′, substantially as described.

12. In combination with the rocking lever r the cover holder q pivoted on the end of said lever and having an angular extended handle q′ for rocking said holder, and means for holding said parts in their depressed position, substantially as described.

13. The combination of lever (b′) having a knee piece (b^4) or pedal equivalent to the same, cord (l), rod (n), oscillating lever (s^3), cord (n′), arm (k), and prongs (j) and (j′) with a book having recesses such as (i′) and (i^2) cut in the pages of the same as and for the purposes substantially as described herein and illustrated in the accompanying drawings.

WILLIAM COATES.

Witnesses:
W. E. HUGHES,
W. ALEXANDER.