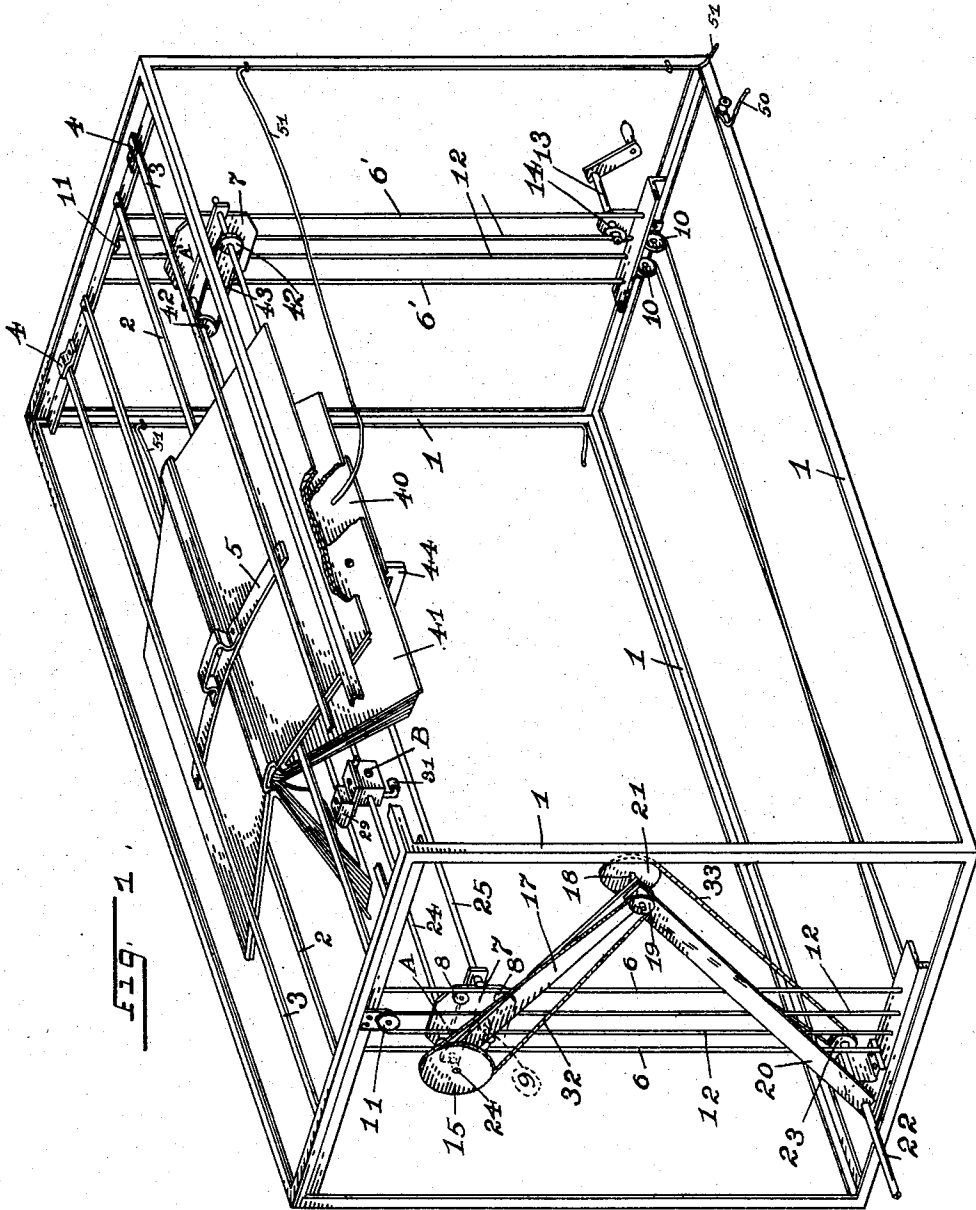


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 BOOK FUMIGATOR.  
 APPLICATION FILED JUNE 2, 1915.

1,169,993.

Patented Feb. 1, 1916.  
 2 SHEETS—SHEET 1.



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Witnesses  
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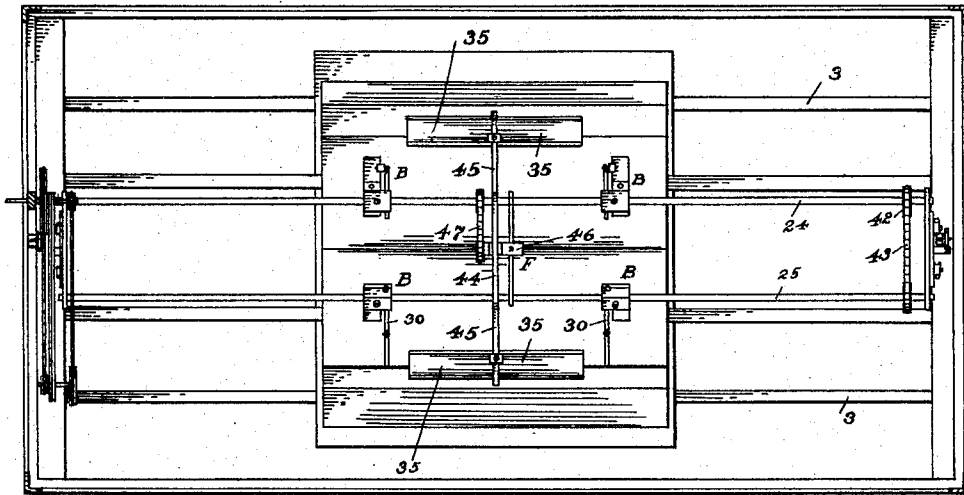


FIG. 2.

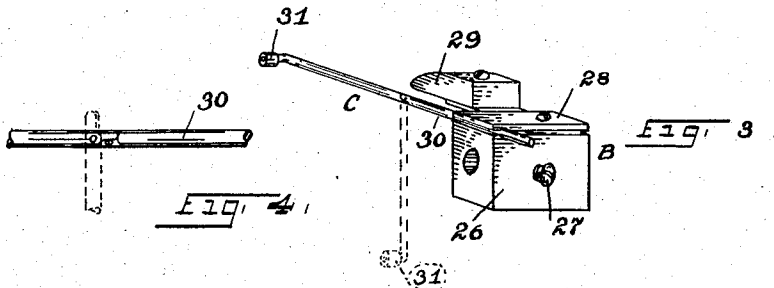


FIG. 4.

FIG. 3.

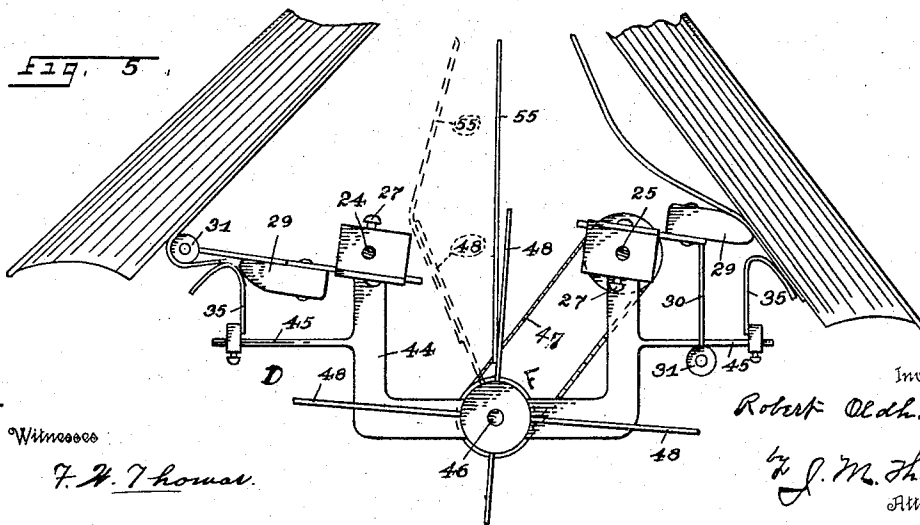


FIG. 5.

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# UNITED STATES PATENT OFFICE.

ROBERT OLDHAM, OF SALT LAKE CITY, UTAH.

BOOK-FUMIGATOR.

1,169,993.

Specification of Letters Patent.

Patented Feb. 1, 1916.

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*To all whom it may concern:*

Be it known that I, ROBERT OLDHAM, a citizen of the United States, residing at Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Book-Fumigators, of which the following is a specification.

My invention relates to book fumigators, and has for its object to provide the means to turn the leaves of a book and apply a gaseous disinfectant to each and every leaf and portion of the book for the required period of time to disinfect or fumigate the same. This object I accomplish with the device illustrated in the accompanying drawings in which similar letters and numerals of reference indicate like parts throughout the several views and as described in the specification forming a part of this application and pointed out in the appended claims.

In the drawings in which I have shown a substantial embodiment of my invention, Figure 1 is a view in perspective of my device with a book therein. Fig. 2 is an inverted plan view of the same. Fig. 3 is a view in perspective showing a detail of one of the leaf turning elements with the leaf lever shown in dotted lines in one of its positions. Fig. 4 is an enlarged view of the joint in the leaf levers. Fig. 5 is an end elevation of the leaf turning and supporting elements.

Frequently in schools and libraries it is desirable to fumigate the books to prevent the spread of contagious diseases. In the efforts by the health boards to prevent the spread of contagious diseases many large libraries and thousands of school books have been destroyed because it was not deemed practical to fumigate and disinfect the books, as each leaf with the covers must be disinfected. I have invented a device wherein one or more books may be placed and by which the leaves of the books may be mechanically and individually turned while the entire book and each individual leaf thereof may be treated with a gaseous disinfectant thereby fumigating every part of the book or books.

In the drawings I have shown a frame on which is secured the mechanical parts of my device but I do not wish to confine myself to a frame for it will be obvious that the said mechanical parts of my device may be mounted in a box or other closed recep-

tacle. I prefer such a frame as is shown at 1, as sheet glass may be fastened to the sides and top thereof, which construction enables me to observe the operation of the leaf turning elements and provide an air tight receptacle within which a disinfecting gas is generated. On the upper portion of said frame is secured the book clamp which consists of flat bars 2 and 3, the latter or those shown at 3 are detachable by slipping the ends from under the catches 4. The back or cover of the book to be treated is held between the said bars 2 and 3 by the hand clamp 5. On the ends of said frame 1 is secured the track on which the leaf turning elements are raised or lowered, and consists of the vertical rods 6 and 6' spaced apart in pairs; between each pair of which the carriages A and A' are operated. Each carriage consists of a sheet of metal 7 on which the pulley wheels 8 are mounted in suitable stub axles or shafts, and said pulley wheels bear against and between said rods 6 and 6'. On each of said carriages a gripping lug 9 is secured extending outwardly from the carriage to which the operating cable or cord 12 is fastened in order that when said cable 12 is drawn endwise that said carriages will be moved up or down between said rods 6 and 6'. The said cable is operated over the sheaves 10 which are mounted on the bottom of said frame 1, and over the sheaves 11 that are mounted on the top cross piece of said frame; and is moved by the crank 13 by being wound around a drum sheave 14 which is fastened on said crank 13. A sprocket wheel 15 is mounted adjacent the said carriage A by being secured on the horizontal shaft 24, and also on said shaft 24 is carried one end of the supporting bar 17, to the other end of which is secured a short shaft 18. A sprocket wheel 19 and the upper end of another supporting bar 20 are journaled on said short shaft 18, which also carries another sprocket wheel 21. The lower end of the said supporting bar 20 is pivoted on a driving shaft 22 suitably mounted in bearings at the bottom of said frame 1. Also another sprocket wheel 23 is carried on said driving shaft 22. The sprocket wheels 15 and 19 are connected by the chain 32 and the sprocket wheels 21 and 23 are connected by the sprocket chain 33. The said carriages A and A' are connected by the horizontal shafts 24 and 25 the ends of which are rigidly secured therein and on

which the leaf turning elements B are adjustably secured and of which there are four, two on each of said shafts. Each of said leaf turning elements consists of a metal cube 26 having a hole therethrough to receive the said horizontal shafts 24 or 25 respectively, and having a set screw 27 threaded therein by which said cube is fastened on said shaft to prevent said element from turning on the shaft or being moved unintentionally along its respective shaft. A clamping plate 28 is fastened by a set screw to one of the faces of said cube 26 to hold the friction element or rubber 29 and the leaf lever C in relative position on the cube 26. The leaf levers of which there are four each consists of a rod or bar 30 having a joint therein and on its free end is mounted a small roller 31, a detail of the joint in said levers is shown in Fig. 4. A leaf supporting member D is also mounted on said horizontal shafts 24 and 25 and consists of metal plates 35, a frame 44 which is carried on said horizontal shafts 24 and 25 and bars 45 connecting said metal plates and the said frame 44. A set of sprocket wheels 42 and chain 43 impart the rotary motion of the horizontal shaft 24 to the shaft 25. A contact weight 40 is secured in a false cover leaf 41, which weight fills the double purpose of supplying additional weight to the said cover leaf and of completing the electric circuit when said contact weight comes in contact with said metal plate 35.

35 The assembling and operation of my device is as follows:—The book to be fumigated is placed in the device by opening the book until the cover or back thereof is in a plane. Two false backs 41 are inserted between the outside leaves of said book and the adjacent back or cover of said book, and securing the book by opening or parting the leaves near the middle and laying the back of the book face down on the said bars 2 and placing the bars 3 on the top of said book back and fastening said bars by slipping the ends thereof under the catches 4, also by placing the ends of the hand clamp 5 between the book back and said bars 3 with the leaves so parted resting on the outer face of said plates 35. The leaf turning elements are then adjusted to the desired position between the parted leaves by turning the crank 13 and thereby raising or lowering the said carriages A and A' until the friction elements 29 touch or contact with the two contiguous leaves previously parted about one-fourth the width of each leaf from its front edge and with each rubber positioned longitudinally one-fourth the length of the leaves from each end thereof. The leaves on one side of the said parting bearing against the curved portion of said metal plate 35 on one side of the device and the leaves on the other side

of the parting bearing against or resting on the other of said metal plates 35. The said supporting bars 17 and 20 allow the said carriages A and A' with the connecting horizontal shafts 24 and 25 and the elements mounted thereon to be raised or lowered without effecting the operation of the leaf turning members, and this allows me to turn the leaves of a book having narrow leaves and to then adjust said carriages vertically and equally as well to turn the leaves of a book having wider leaves. The adjustment of the friction members by means of the clamping plate 28 enables me by turning shafts 24 and 25 to apply the requisite friction to turn a leaf as a child does with its moistened thumb, while by the same adjustment to engage the opposite leaf with the rollers 31 on the free end of the leaf levers 30 and push said leaf to the face or curved side of the adjacent plate 35. The joint in the leaf levers will allow said levers on one horizontal shaft to pass the leaves when said levers are being raised and to bear against the leaves when said levers on the other horizontal shaft are being lowered. On the said horizontal bars 24 and 25 is adjustably secured a U-shaped frame 44 to which is adjustably fastened the said metal plates 35 by means of the extended bars 45. The leaf placing member F is mounted on said frame 44 and consists of a shaft 46 journaled in said frame and operated by means of a sprocket chain 47 connecting a sprocket wheel on said horizontal shaft 24 with one on said shaft 46. In said shaft 46 is radially fastened the feather springs 48, four in number with the free ends thinned or tapered to resemble a feather in elasticity, and when operated as spokes they move or turn the leaves from a depending vertical position they are apt to assume as at 55, in Fig. 5, to one side and in the path of the leaf lever C on that side where the said leaf lever C engages said leaf and it is moved or pushed by said rollers 31 contiguous the turned and fumigated leaves to the left as shown in Fig. 5.

My device is electrically operated by power being applied to rotate the said driving shaft 22 to the left or to the right as required. To change the direction in which the leaves are turned and to make said change automatically and at the required time I use electricity generated by a dry battery (not shown). The current from said battery is carried to the frame of the machine over the wire 50 and to the said weight 40 fastened in the false back 41 by the wire 51. When the last leaf is turned away from said false cover leaf 41 the metallic weight 40 which is secured in said cover leaf will by gravity fall into contact with the adjacent plate 35 and complete the electric circuit. The completion of the said

circuit will turn said shaft 22 in a reverse direction to what it has just been turning and all of the said mechanism will be turned in the opposite direction to what it has just been turning. The friction members will then engage with and turn the leaves toward the empty sides and continue to do so until all of the leaves are so turned and there is another contact formed with the opposite metal plate 35 and metallic weight 41.

Having thus described my invention I desire to secure by Letters Patent and claim:—

1. A book fumigator comprising a closed receptacle; clamps to hold the back of a book in a plane, with the leaves depending; a pair of metal plates on which said depending leaves may rest and give the book an A-shape; friction members to engage one of the leaves resting on one of said plates and shift the free edge thereof to a vertical position; leaf levers to engage said partially turned leaf and push it beyond the other metal plate; means to rotate said friction members and said leaf levers around their respective axes; and means in said receptacle to disinfect said leaves during the turning operation.

2. A book fumigator comprising a closed receptacle filled with a disinfecting gas; means to hold a book with its back in a plane, and the leaves depending; a pair of opposed metal plates on which said leaves rest to partially open the book; rotatable friction members to engage an individual leaf resting on one of said plates and shift it to a vertical position; and means to engage said partially turned leaf and push the free edge thereof beyond the other metal plate.

3. A book fumigator comprising a closed receptacle filled with a disinfecting gas; means to hold a book with its back in a plane and the leaves depending; a pair of opposed metal plates on which said leaves rest to partially open the book; rotatable friction members to engage an individual leaf resting on one of said plates and shift it to a vertical position; and means to engage said partially turned leaf and push

the free edge thereof beyond the other metal plate, said means consisting of rotatable feather springs and rotatable leaf levers.

4. A book fumigator comprising a closed receptacle within which a disinfecting gas may be generated; means to hold a book partially open in the upper part of said receptacle, said means consisting of flat bars to clamp the back of the book and a pair of opposed metal plates; means to shift the leaves, one at a time, which rest on one of said metal plates so that they will rest on the other of said plates, said means consisting of friction members and leaf levers; and power driven shafts rotatable in either direction to move said friction members and leaf levers in order that said leaves may be shifted to the right or to the left.

5. A book fumigator comprising a closed receptacle within which a disinfecting gas may be generated; means to hold a book partially open in the upper part of said receptacle, said means consisting of flat bars to clamp the back of the book and a pair of opposed metal plates; means to shift the leaves one at a time which rest on one of said metal plates so that they will rest on the other of said plates, said means consisting of friction members and leaf levers; and power driven shafts rotatable in either direction to move said friction members and leaf levers in order that said leaves may be shifted to the right or to the left; and means to automatically change the direction in which said shafts are rotated, said means consisting of a contact weight secured in a false back adjacent the back of said book; and electric wires leading from said contact weight and said receptacle to a source of electric energy by which an electric circuit is completed when the last leaf is shifted from between said metal plate on either side and the contact weight adjacent.

In testimony whereof I have affixed my signature in presence of two witnesses.

ROBERT OLDHAM.

Witnesses:

JOHN W. STAFFORD,  
SAM RANEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."