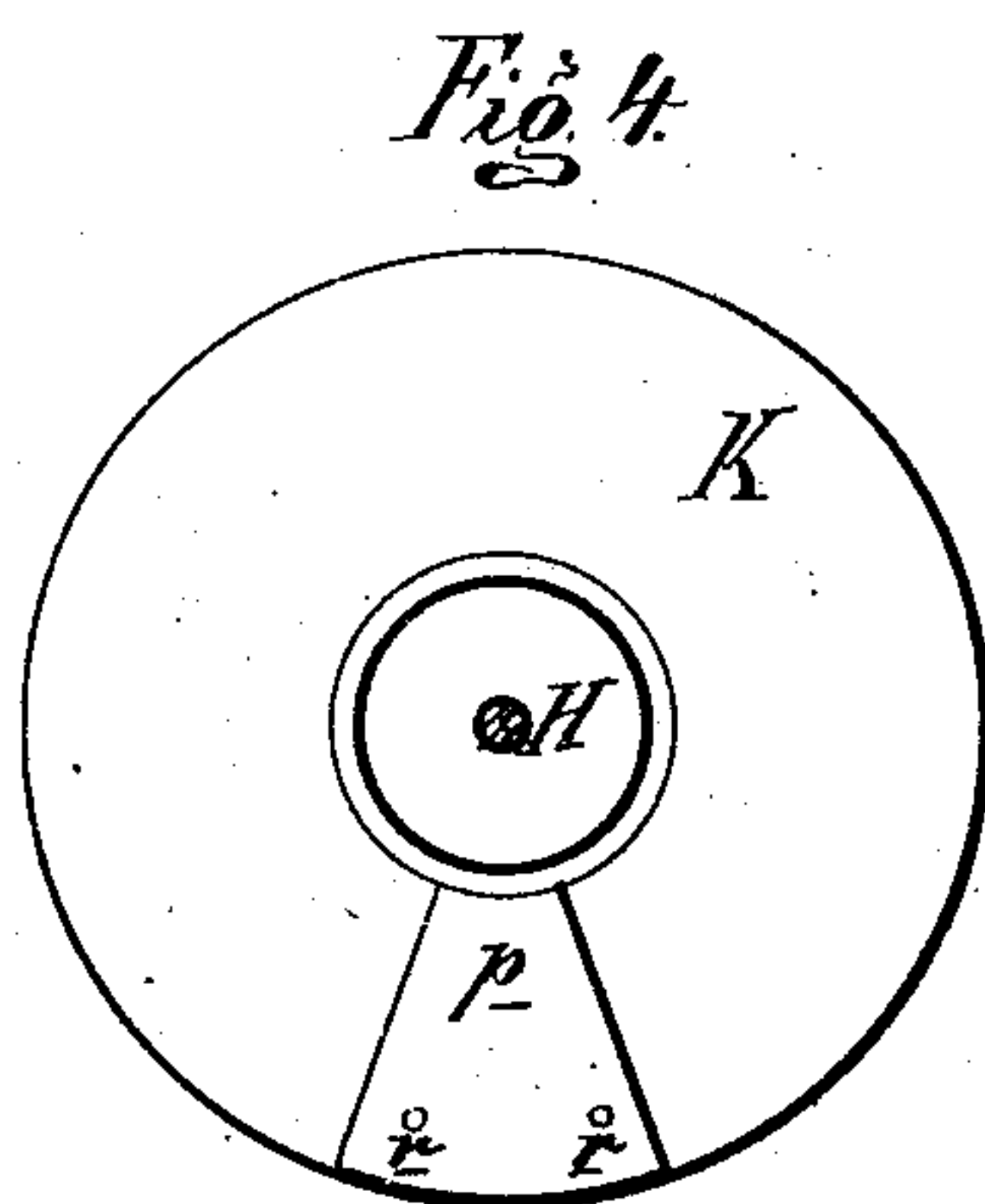
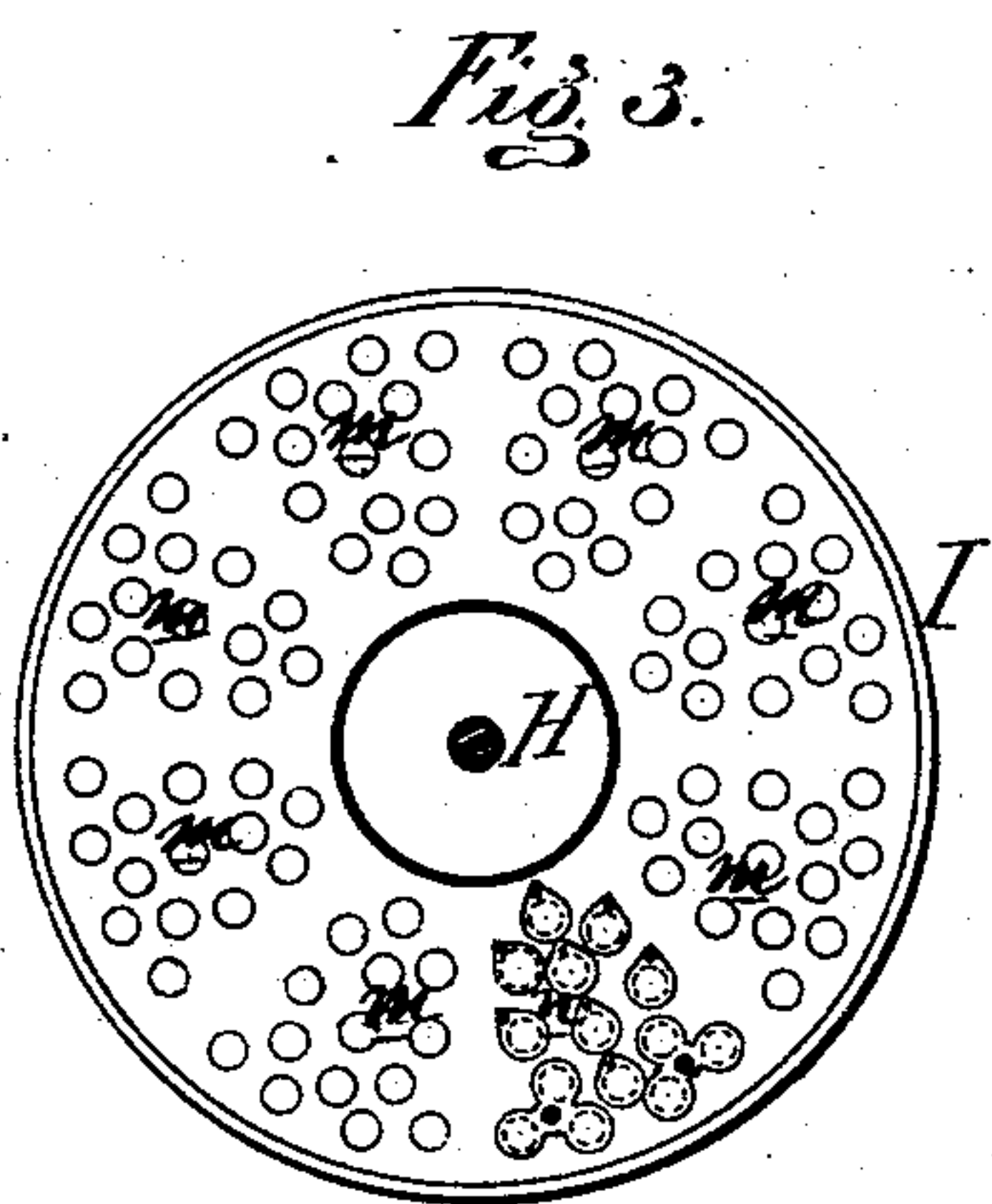
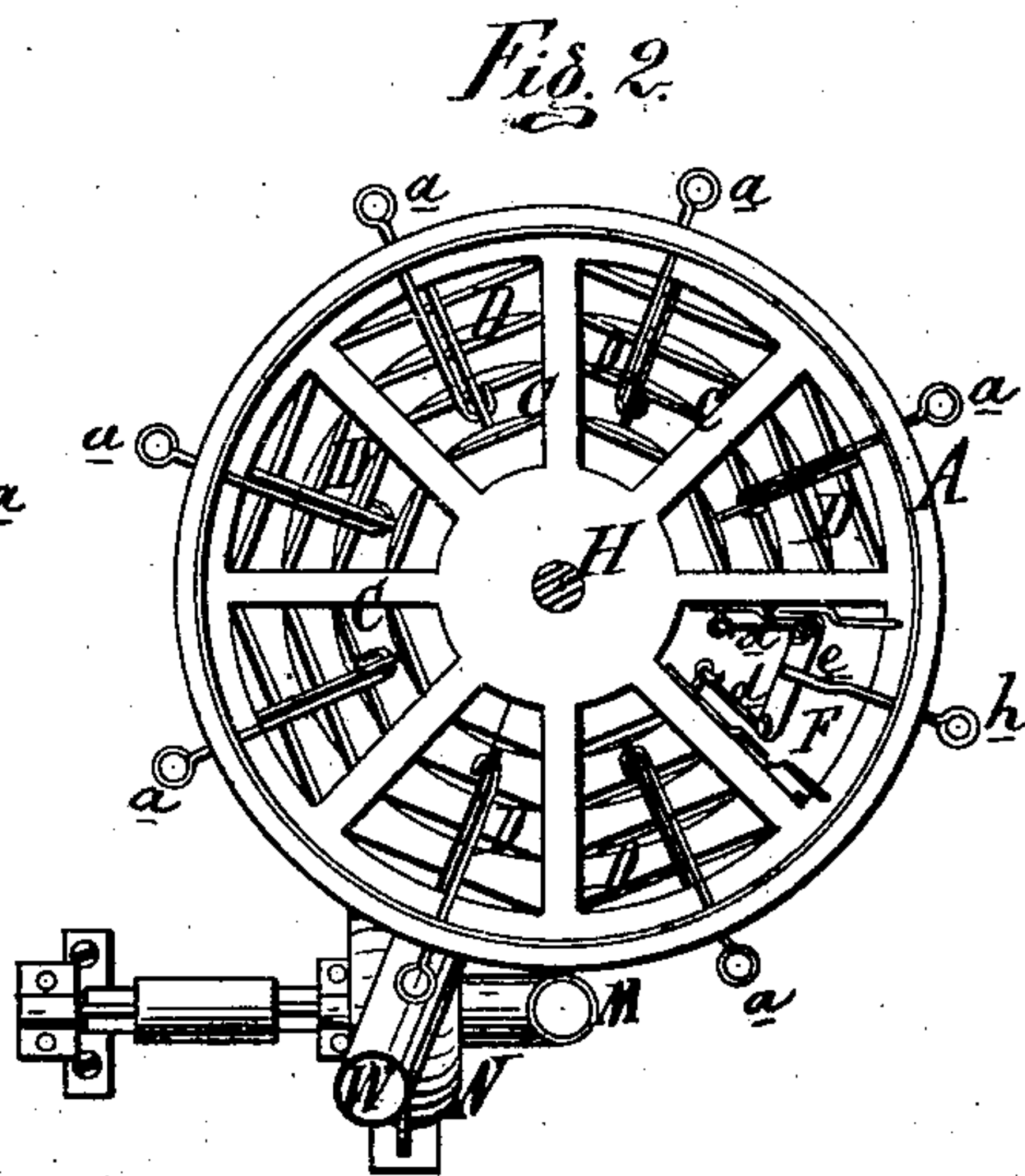
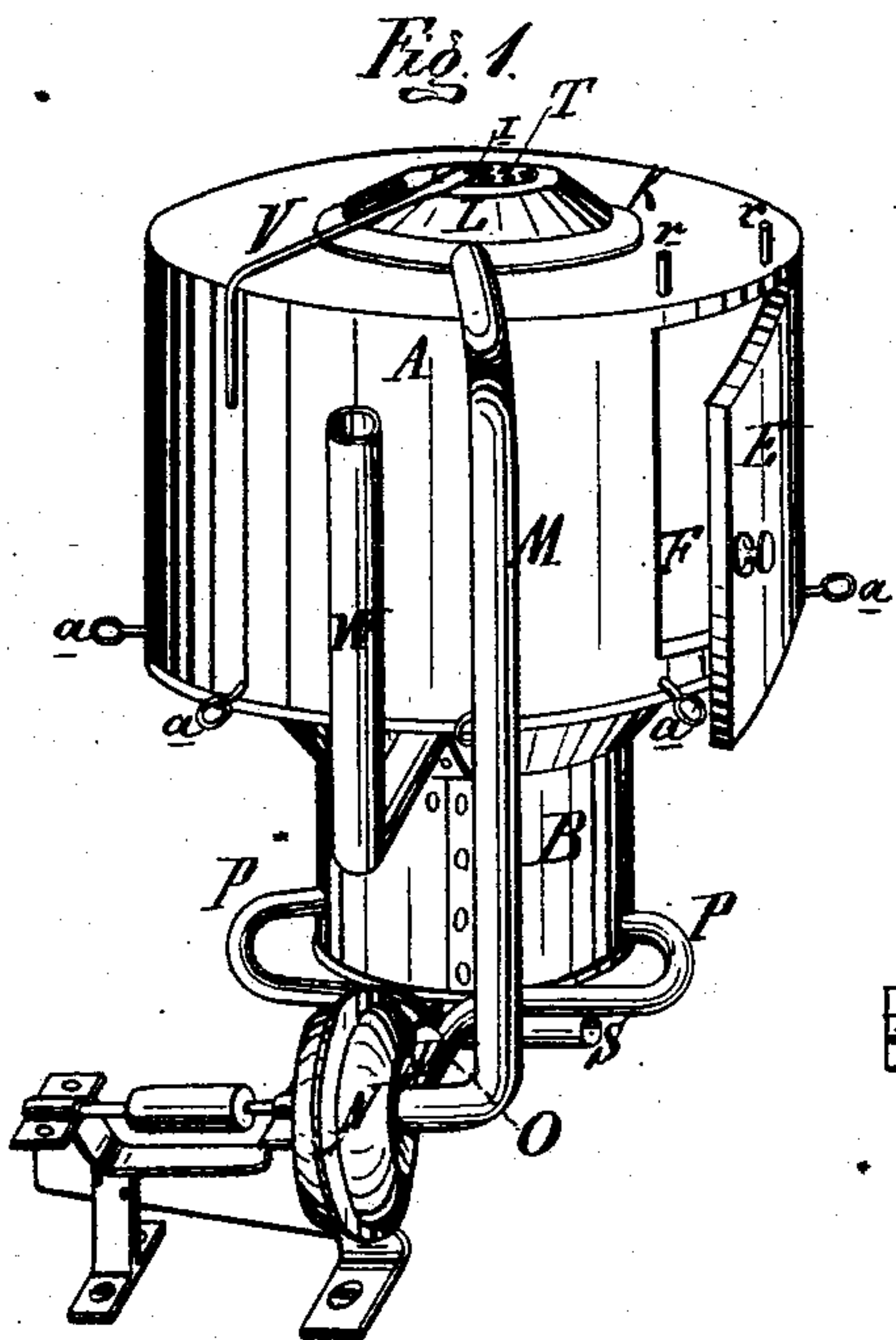


H. J. ALLEN.  
Fruit-Drier.

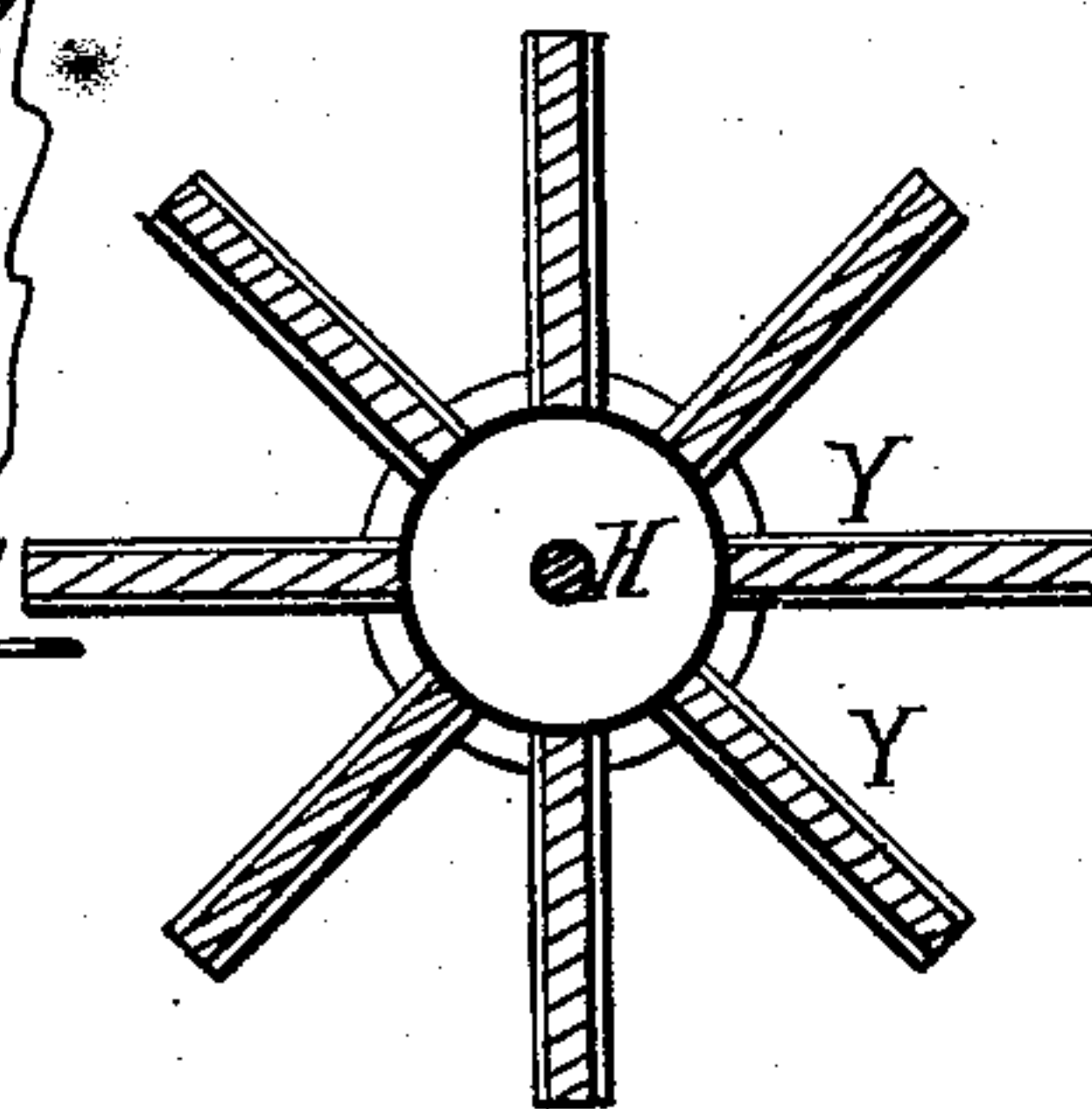
No. 160,377.

Patented March 2, 1875.

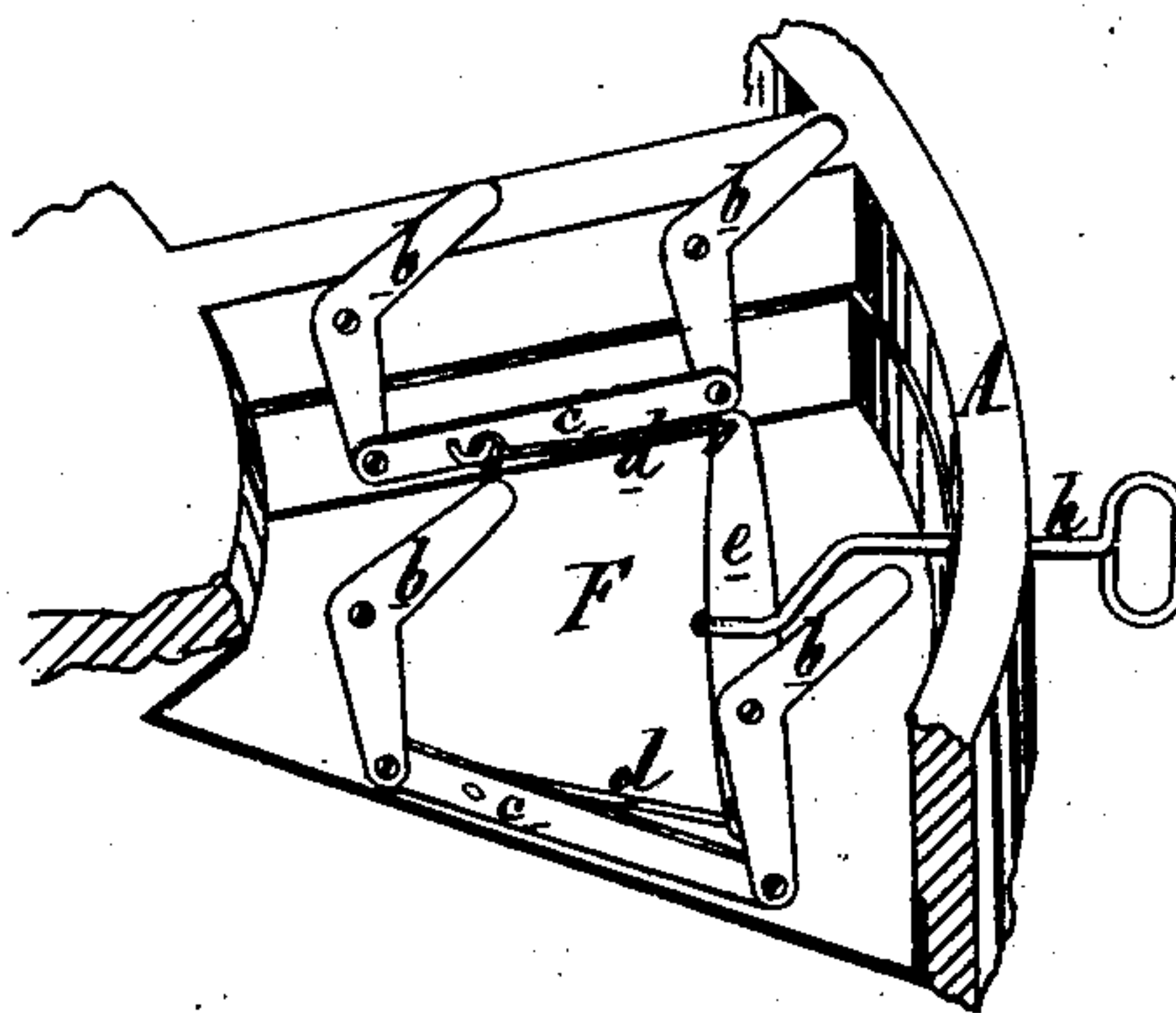
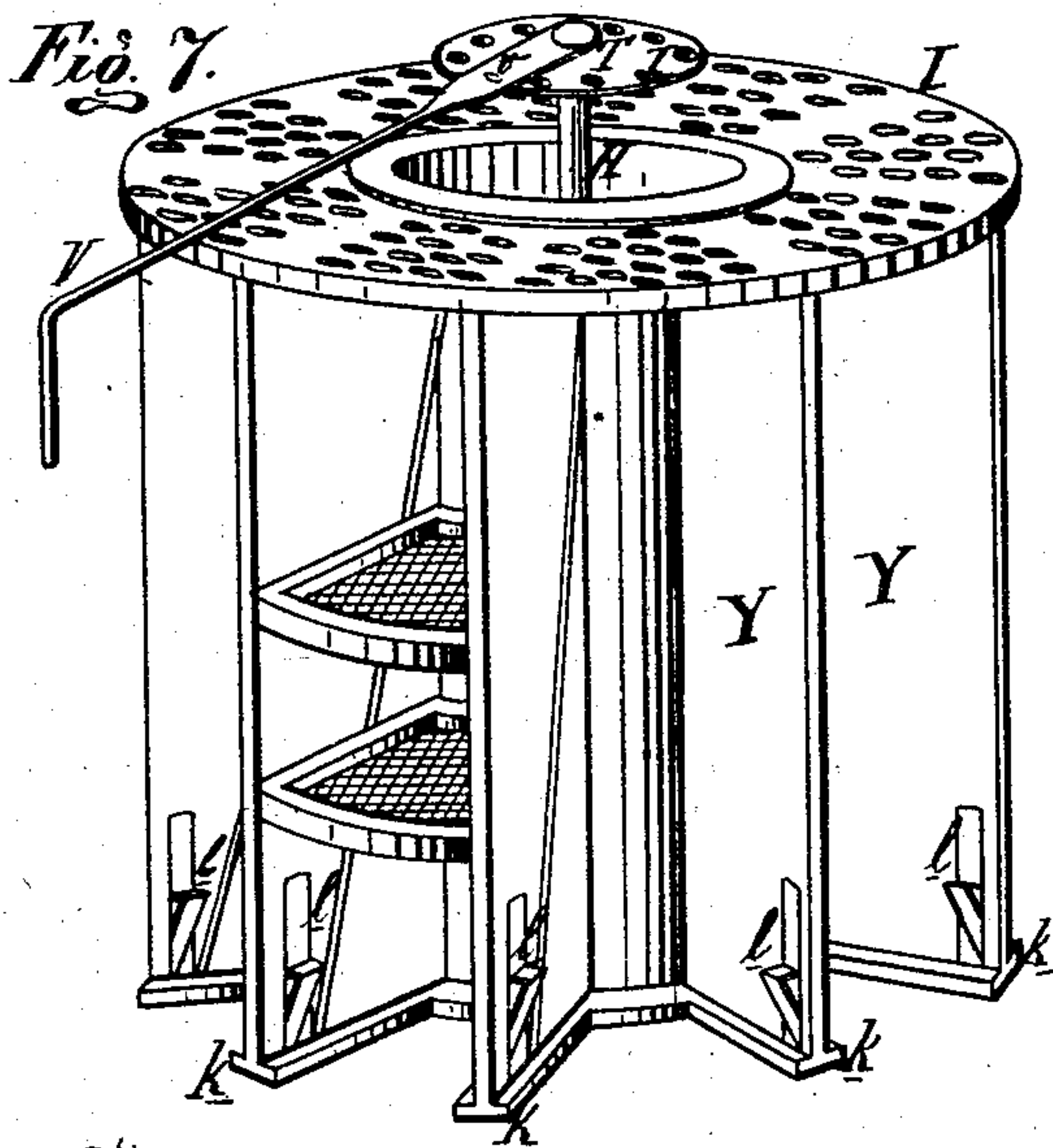


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*Fig. 8.*



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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN FRUIT-DRIERS.

Specification forming part of Letters Patent No. **160,377**, dated March 2, 1875; application filed August 28, 1874.

*To all whom it may concern:*

Be it known that I, H. JULIAN ALLEN, M. D., of Sturgis, in the county of St. Joseph and State of Michigan, have invented an Improvement in Fruit-Preserving Apparatus, of which the following is a specification:

The nature of this invention relates to certain improvements in the construction and operation of an improved apparatus for curing fruits, vegetables, meats, and other articles, which it is desired to preserve in a fresh or unpickled state; and its object is to provide an apparatus that will be simple and effective in its operation, as fully hereinafter described.

Figure 1 is a perspective view of my improved apparatus. Fig. 2 is a plan view of the bottom of the drum, cylinder, or inclosing-cylinder. Fig. 3 is a plan view of the under side of the top of the fruit-drying chambers. Fig. 4 is a plan view of the under side of the cap or roof. Fig. 5 is a vertical section through the center of the door-section. Fig. 6 is a cross-section through the middle of the drying-chambers. Fig. 7 is a detached perspective view of the rotary radial fruit-chambers. Fig. 8 is a detached view of my device to raise the screens or platforms upon which the articles to be dried are placed.

Like letters indicate like parts in each figure.

In the drawings, A represents an inclosing-cylinder, beneath which a furnace or heating-chamber, B, is placed. The bottom of the chamber A is radially divided into as many sections as there are drying-sections in the chamber when the parts are all in place. Each one of these sections C communicate with the heating-chamber below, and this communication is cut off entirely or governed at will by the folding dampers D, operated from outside the inclosing-cylinder by the rods *a*, projecting through the wall. E is a door opening into a radial chamber, F, which has no communication with the heating-chamber below, as no hot or heated air is desired in this chamber, as, whenever the door is opened, much of the heated air would be lost. G are other radial chambers, made with vertical radial walls extending from bottom of inclosing-cylinder to the top thereof, and radially from the

center post H to the inner wall of the inclosing-cylinder, thereby dividing said chamber into a series of radial chambers, as shown and described. In the bottom of the door chamber F, and on the two sides thereof, are placed a pair of eccentric levers, *b*, or more properly these levers may be termed bell-cranks, pivoted to the sides of the bottom of this chamber, and connected together by the rod *c*, and then operated by the rods *d*, coupler *e*, and rod *h*, protruding through the wall of the circular chamber. The bottom ends of the radial division-walls terminate in flanges *k*, and the levers *b* are so arranged that when folded down they are below the plane of the lower ends of the radial walls, so that the latter may be rotated freely with the center post. The drying frames or screens, which are made to conform in shape to the shape of the radial chambers, are filled with fruit or other articles to be dried, and placed so that the lower one rests on the flanges *k*; then pulling out the rod *h*, the bell-crank arms are thrown up against the under side of the fruit-screen frames, and raise them off the flanges, and carry them up by the spring-catches *l*, two of which are suitably secured to each of the walls of each radial chamber, where they rest, while the levers are thrown back to their original position. The top I of the radial chambers is provided with a number of openings, *m*, which allow the heated air to rise into the open space J between said top and the top K of the inclosing-cylinder. On the under side of the top I there are provided slides, removable covers, or dampers *n*, which operate singly, and by means of which any or all of the openings in that section may be closed at will. Between the tops I and K, and in the open space J, there is a damper, *p*, made of sufficient size and shape to cover all the openings *m* in the door-section. This damper is operated from the top K, and above the same, by the rods *r*. L is a small dome or elevation above the top K, and interiorly communicates with the open hot-air space J, between the tops. A pipe, M, leads from this dome to the rotary exhaust-blower N, from which another pipe, O, communicates with the interior of the heating-chamber by branches P, or direct,



as may be most desirable. A small drip-pipe, *s*, affords communication between the pipe *O* and the reservoir *S*, whence the drip may be drawn off by any suitable means. A disk, *T*, is secured on top of the center post, and is provided with a series of holes, *t*, corresponding in number with the number of radial chambers. A lever, *V*, is pivoted to the top of the center post *H*, and projecting from its under side is the stud *v*. *W* is the pipe which carries off the smoke from the heating chamber or furnace. It will be noticed that the radial chamber into which the door affords access is closed at bottom, having no communication with the heating-chamber, and by means of the damper *p*, when said damper is closed, which should always be the case when the door is opened, is closed at top. We will suppose that all the radial chambers have been filled with screens or platforms covered with fruit. The damper *p* is closed, the door opened, and the fruit examined. If that upon the upper screen or platform is sufficiently cured, the screen is removed, a fresh screen covered with fresh fruit is inserted on the flanges, the bell-cranks operated, as hereinbefore described, when the newly-inserted screen is elevated up onto the spring-latches, raising the balance of the screens to make room for it. If, upon examining the fruit on the upper screens, the curing process is found to be going on unevenly, the openings *m* immediately over that part of the screen where the curing is too slow may be uncovered, to allow a draft from the heating-chamber to pass up through, thereby increasing the rapidity of the curing at points where needed. The door is then closed, the damper *p* raised, and the chamber rotated until the next one in order is presented, when the work just described is repeated, and so on, indefinitely, or as desired.

It will be noticed that all the radial chambers, except that one at the time being in connection with the door-section, communicate with the heating-chamber.

The heated air rises into said radial chambers, the openings *m* in the top being open; consequently the heated air passes up through the chambers, absorbing the moisture from the fruit into the open space *J*, whence it is drawn through the pipe by means of the blower, and thence it is sent into the heating-chamber again to be reheated, thereby effecting a large saving in fuel. The air as it comes from the curing-chambers is quite moist. In the pipe leading from the blower to the heating-chamber this moisture has a tendency to condense. The condensation passes off through the drip-pipe into a suitable closed reservoir, whence it may be drawn off at will.

In curing eggs in this apparatus it becomes necessary to draw the hot air from the heating-chamber, and force it from the top of the device, and down through the radial curing-chambers.

In order to accomplish this end it becomes

necessary to connect the blower-pipe with the pipe *M*, and the exhaust side of the blower with the pipe *O*, they reversing the currents and throwing the heated air into the top of apparatus. Notwithstanding a certain amount of condensation has taken place in the pipe, as hereinbefore described, the air forced into the heating-chamber is still quite damp. The air being forcibly thrown against the furnace in the heating-chamber is reheated, and the water to some extent decomposed; and each time it is drawn through the fruit absorbs still more moisture, which is, in like manner, as described, disposed of, until the fruit is perfectly cured.

Any analogous device may be employed instead of the bell-cranks and levers, as described, for raising the frames or screens to place in the curing-chamber.

If preferred, a rack with suitable lever-pawl may be employed on top of the center post to rotate the radial chambers.

The openings *m* should always be open, except when necessary to close, or partially close, the openings, to compel a stronger current through that part of the chamber where the curing process is slower than desired; or, in other words, the dampers *n* make the operator to draw the air from all parts of the inclosing-cylinder alike, and toward a common center whence it is exhausted, as described.

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

1. A series of radial chambers, rotating upon a common center post, and arranged within an inclosing-cylinder, all of said radial chambers, except the one adjoining the door, communicating with the heating-chamber below, and a space above, substantially as and for the purposes set forth.

2. The combination, with the revolving radial chambers, of the openings *m*, communicating with the space *J*, and dampers *n* and *p*, as and for the purpose set forth.

3. The combination, with the revolving radial chambers and the inclosing-cylinder, the devices herein named, for rotating said radial chambers, consisting of the disk *T* and lever *V*, as set forth.

4. The door section of the inclosing-cylinder, in combination, with the radial chamber in connection therewith, said radial chamber having no communication with the heating-chamber, and being cut off from communication with the space above by the cover or damper *p*, substantially as described, and for the purposes specified.

5. The combination, with the revolving radial chambers, open space *J*, and dome *L*, of the pipe *M*, rotary exhaust-blower *N*, pipes *O P P*, drip-pipe *s*, and closed reservoir *S*, all constructed and arranged substantially as described and shown.

6. In combination with the door section and a revolving or radial chamber, into which the door opens, the devices or spring-latches, in



connection with the devices for raising the fruit-screens, substantially as specified.

7. In combination with the heating-chamber B, the revolving radial chambers, and inclosing-cylinder, the series of folding dampers D, to close the bottom of said radial chambers, and the dampers *n* and *p* for closing the top of the same, as set forth.

8. In combination with the pipe O, the drip-pipe *s* and closed reservoir S, substantially as shown.

H. JULIAN ALLEN.

Witnesses:

CHAS. E. HUESTIS,  
H. S. SPRAGUE.