

No. 795,745.

PATENTED JULY 25, 1905.

G. F. WILLIAMS.
VENTILATOR.

APPLICATION FILED JULY 18, 1902.

4 SHEETS--SHEET 1.

Fig. 1.

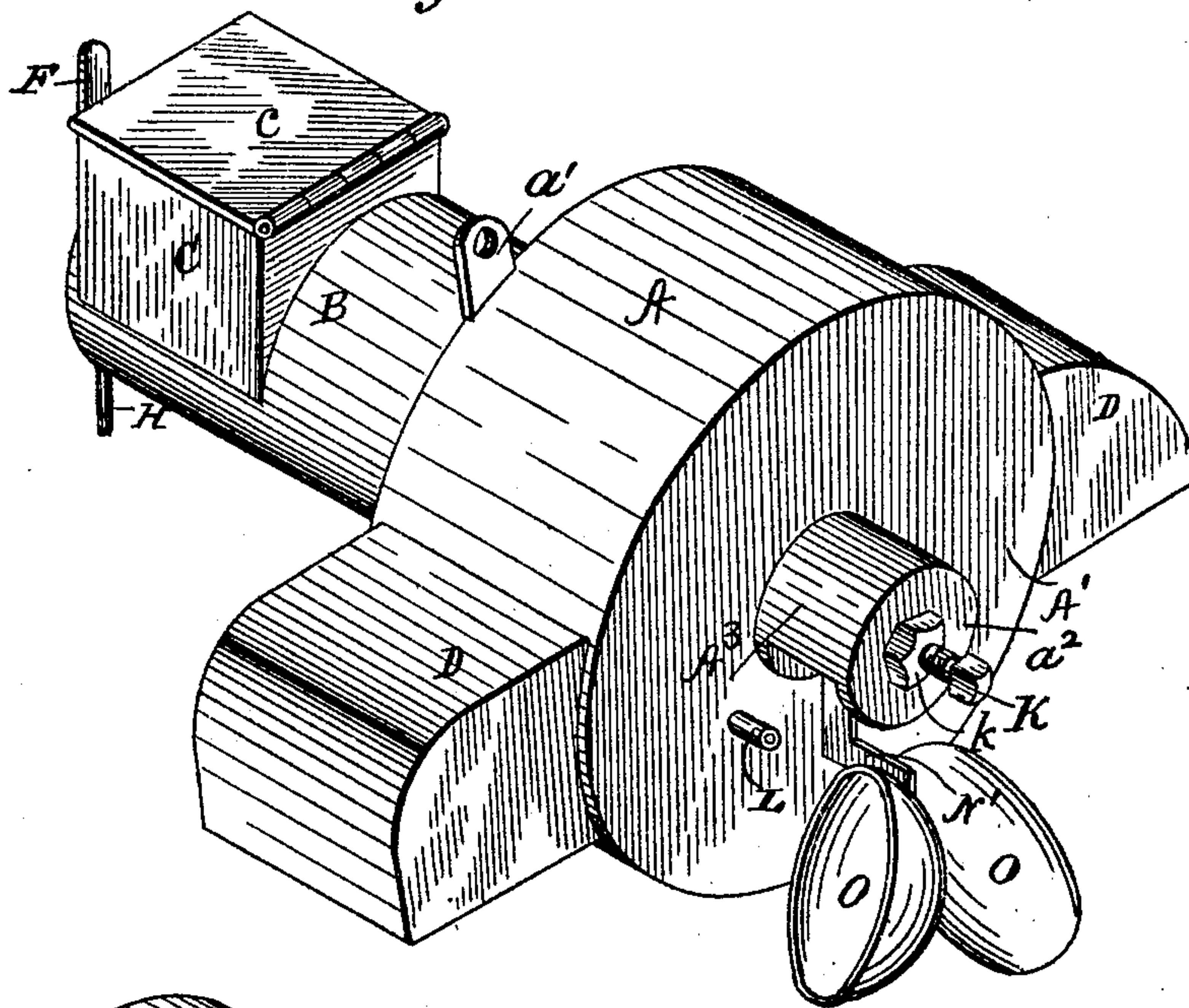
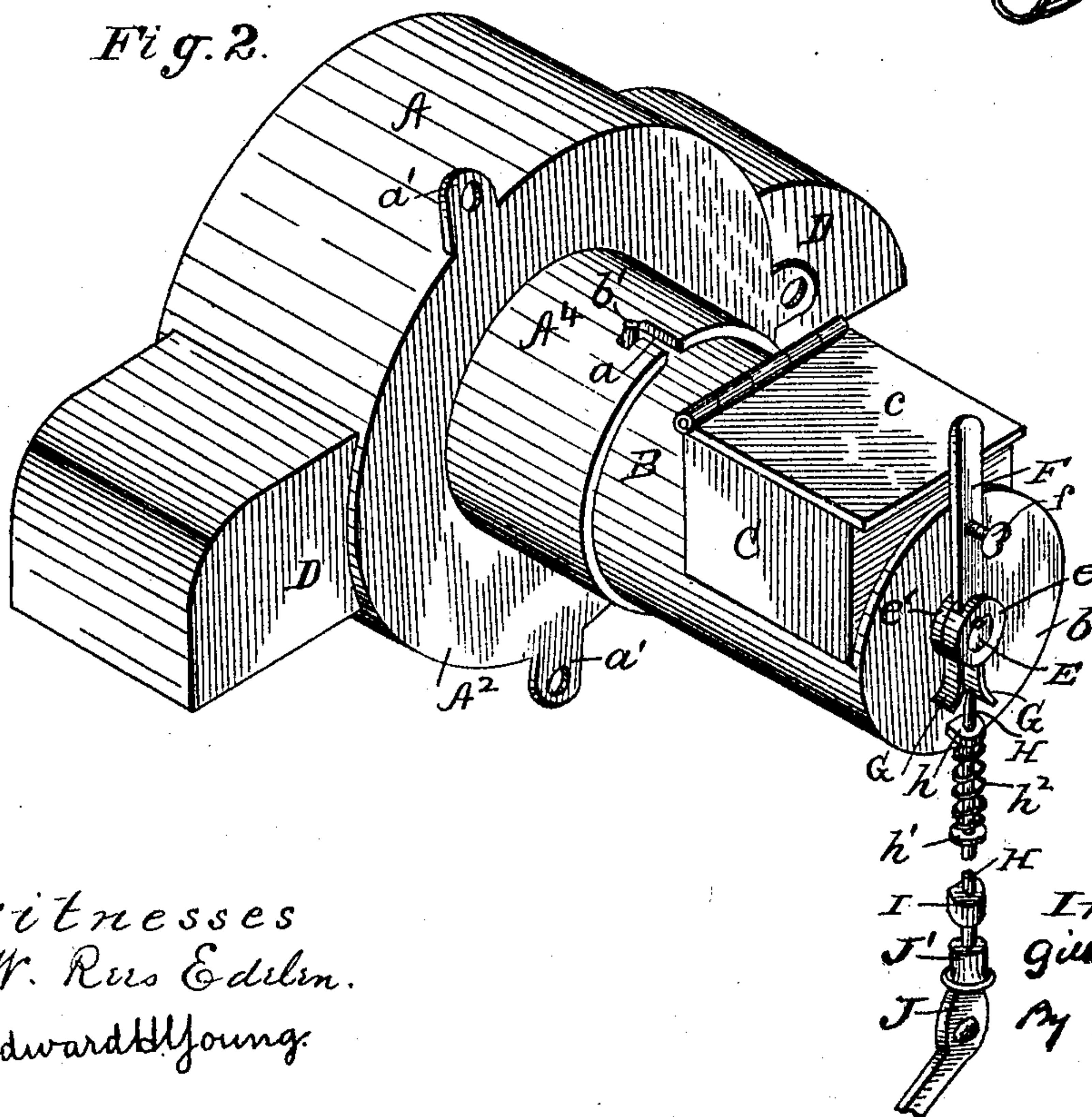



Fig. 2.



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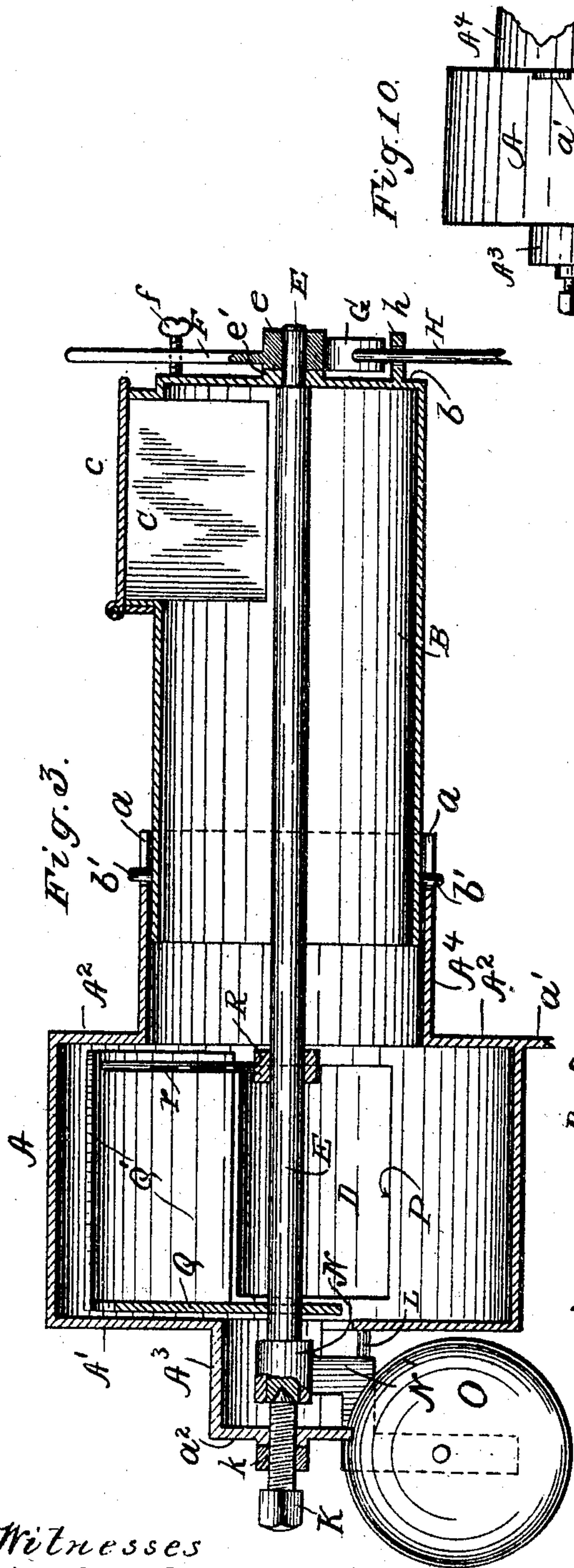
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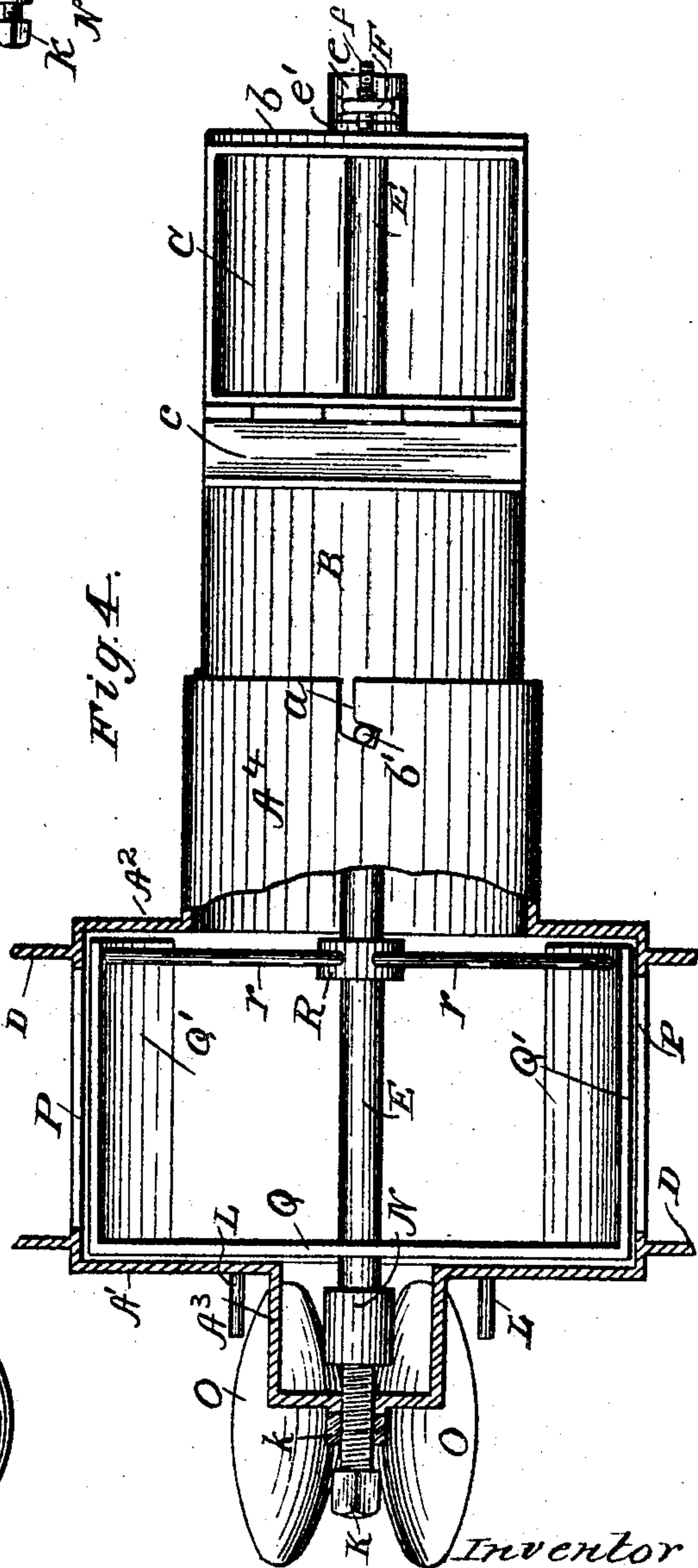
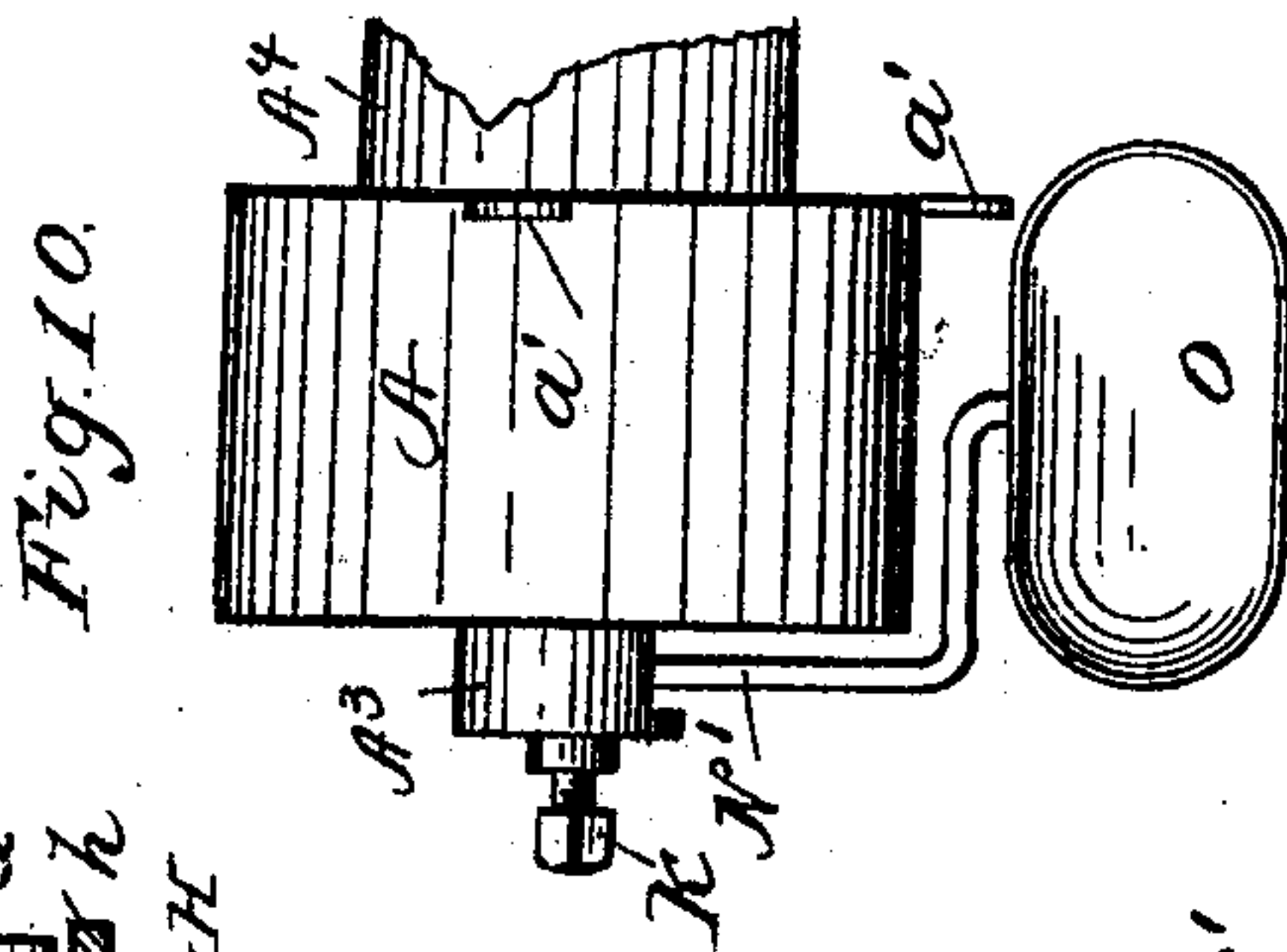
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

Fig. 5.

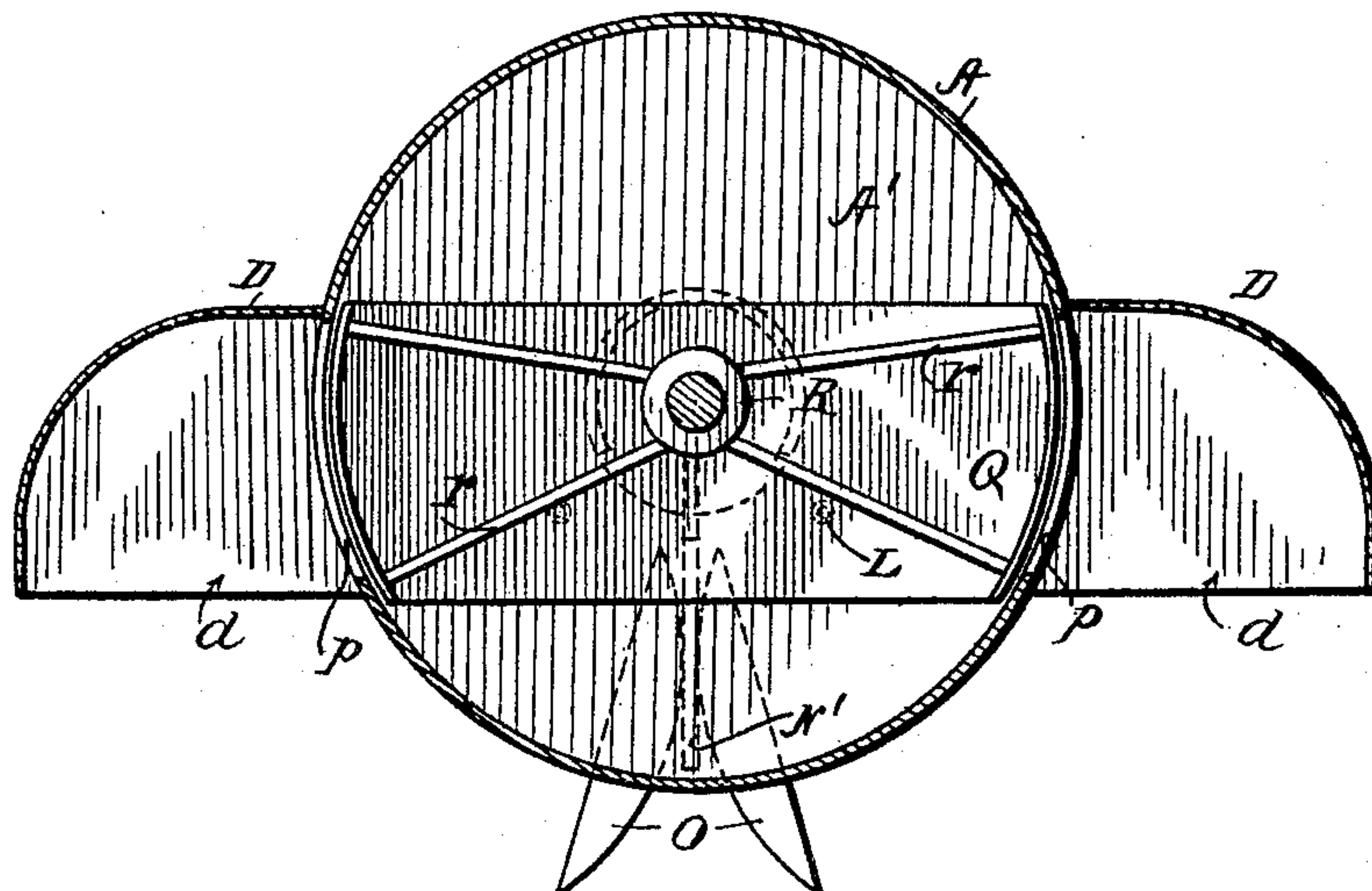
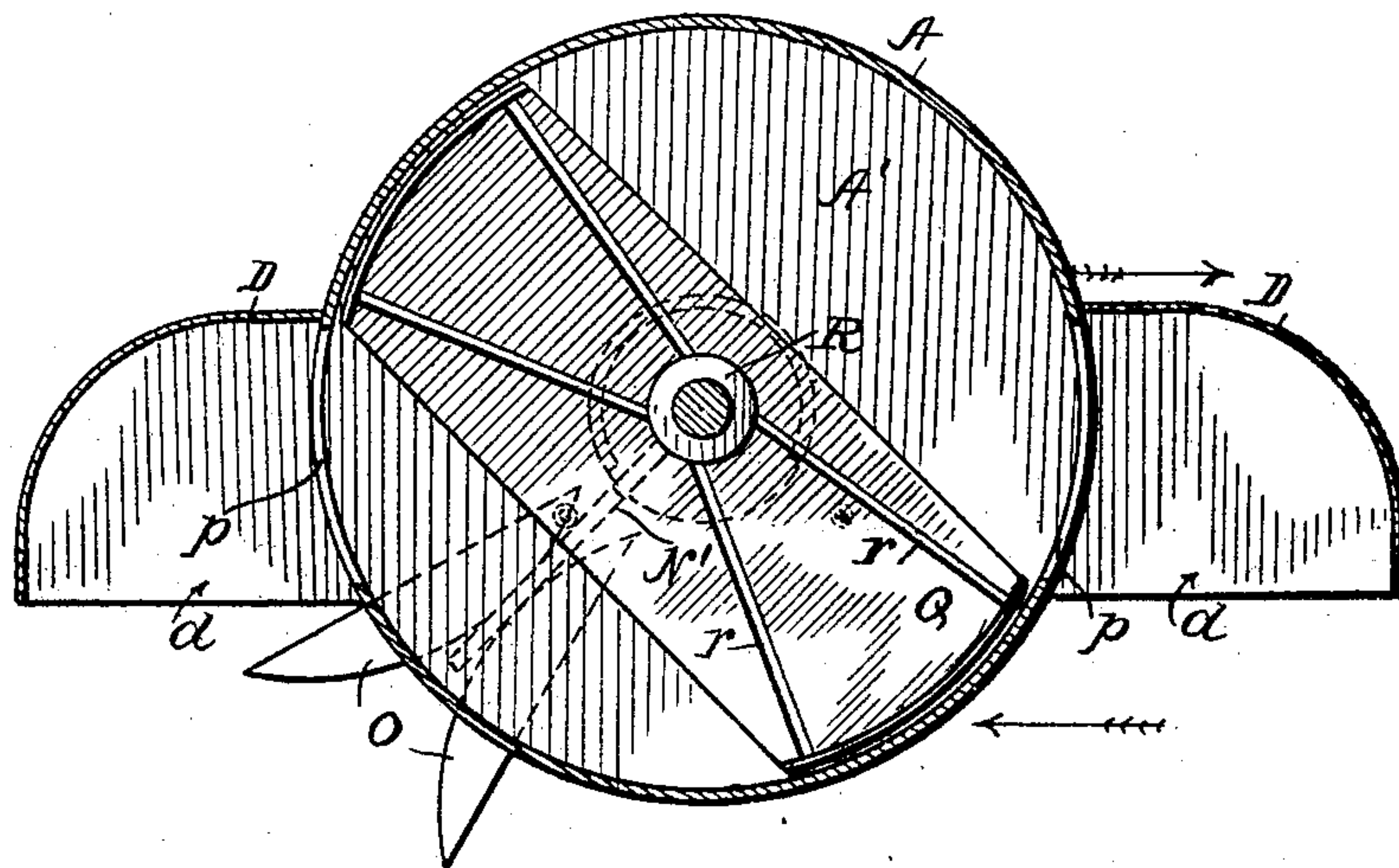


Fig. 6.



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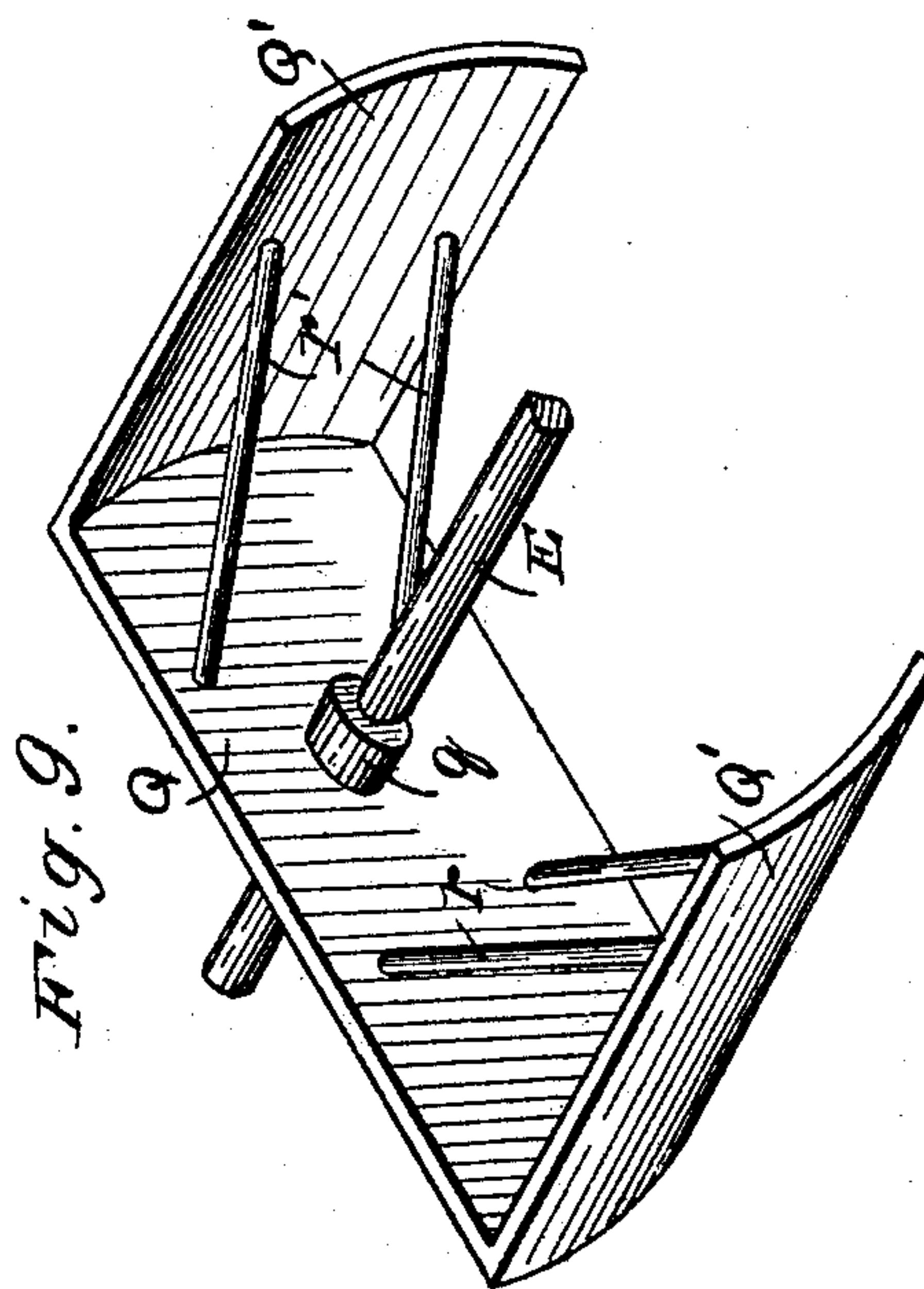
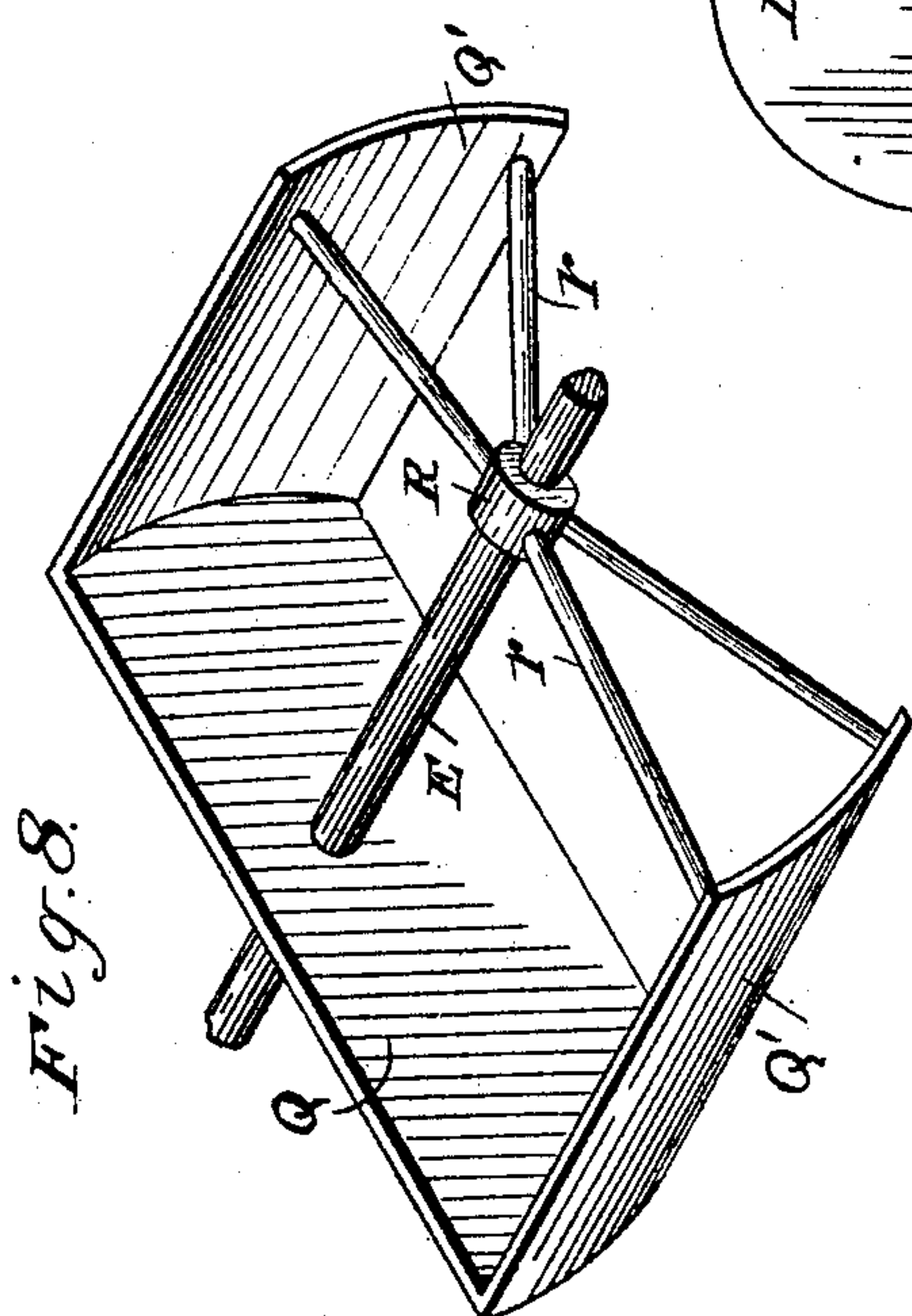
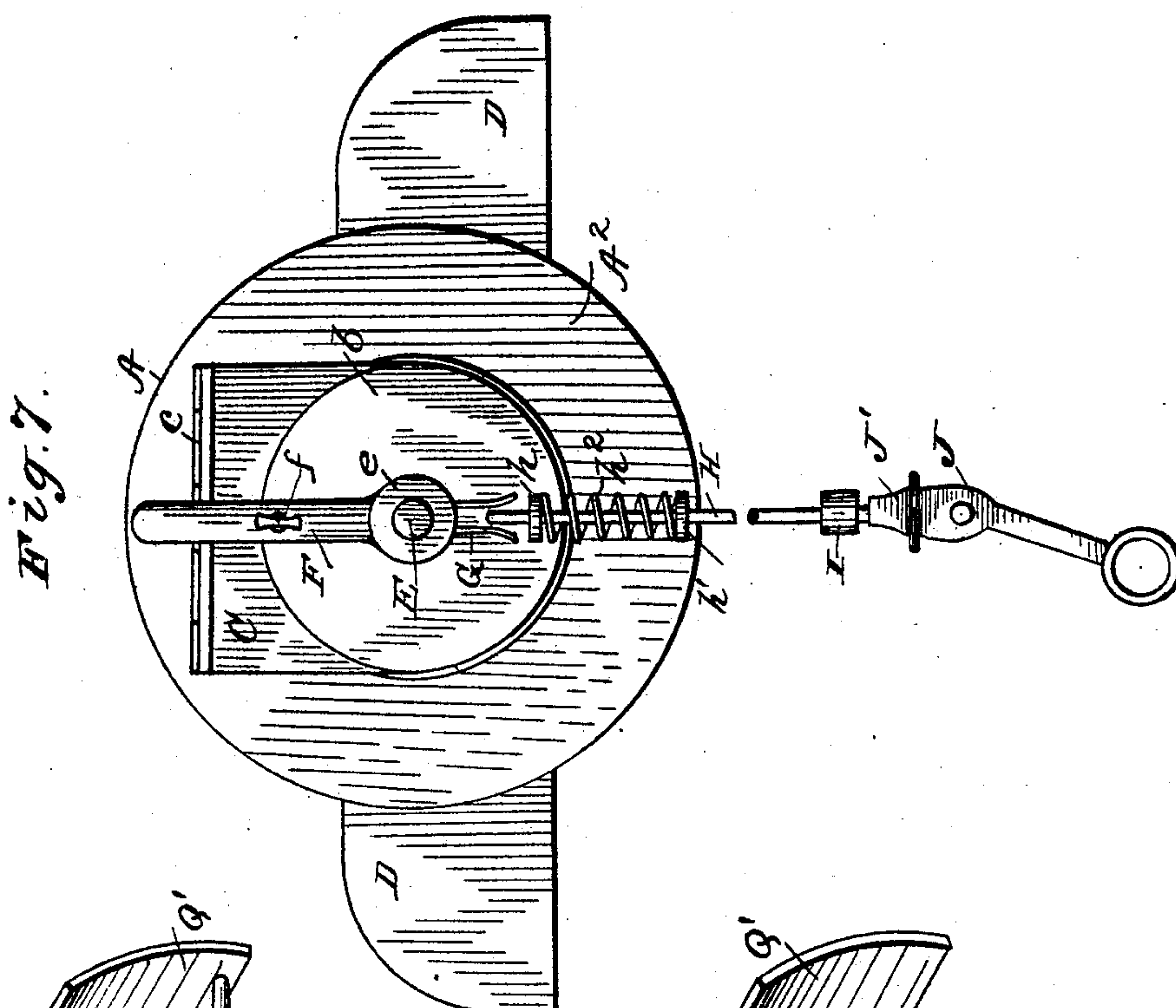
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PATENTED JULY 25, 1905.

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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

GILBERT F. WILLIAMS, OF WASHINGTON, DISTRICT OF COLUMBIA.

VENTILATOR.

No. 795,745.

Specification of Letters Patent.

Patented July 25, 1905.

Application filed July 19, 1902. Serial No. 116,249.

To all whom it may concern:

Be it known that I, GILBERT F. WILLIAMS, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Ventilators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in ventilators, and it is embodied in the construction and arrangement of parts presently to be described.

The invention relates more particularly to ventilators of that type which creates or permits an exhaust or escape of air from a compartment or chamber.

The structure presently to be described comprehends and includes features adapting the ventilator for use in connection with railway-cars more particularly; but its useful application can be made and applied to houses, boats, traction-cars, and other structures, such as storage-buildings.

In the art of ventilation it has been found that in many cases a successful introduction of fresh or dry air is dependent largely on the proper escape of the contained air within the compartment, and the present invention is designed to provide means for permitting free and in many cases accelerated exhaust from the compartment. It is also necessary to have such exhaust under perfect control.

The aim and purpose therefore of the present invention is to provide an exhausting-ventilator which will accomplish the purposes above stated and in addition thereto which will act automatically in accordance with the varying external conditions of the atmosphere.

In my pending application, filed May 9, 1902, Serial No. 106,583, I have shown and described a ventilating device wherein a constant and regulated supply of air is admitted to a compartment, and the present invention while not being primarily intended for use in connection with the device of the said application can be very conveniently used therewith for exhausting purposes, both of said devices being automatic and governed according to the external conditions or pressures. It is, however, to be understood that the present invention can be used successfully and with great advantage without being associated with any supplying-ventilators.

In the drawings I have shown a construction embodying the principles of the invention; but it is to be understood, of course, that the invention is susceptible of wide modifications as to structure and arrangement of parts without departing from the nature and principle thereof.

Figure 1 is a perspective view looking from the outer end of the device. Fig. 2 is a similar view taken from the opposite end. Fig. 3 is a longitudinal vertical section. Fig. 4 is a plan view showing a portion in section. Figs. 5 and 6 are transverse sections through the drum or casing, showing a shutter or closing device in different positions. Fig. 7 is an end elevation. Fig. 8 is a perspective view of a shutter. Fig. 9 is a similar view of a modified form; and Fig. 10 is a side elevation of a drum portion, showing a modified arrangement of an air-vane.

In the drawings, A designates a drum or casing which is conveniently although not necessarily formed in cylindrical shape, having end walls A^1 A^2 . From the end wall A^1 projects a bracket member A^3 , which is conveniently of semicylindrical formation, having an outer end a^2 , the end wall A^1 being perforated at the inner end of the bracket, as shown in Figs. 3 and 4. The drum or cylinder has a large central opening in what shall be termed its "rear" end, from the marginal walls of which extends a cylindrical flange A^4 , having in its opposite sides an L-slot a , leading in from its outer edges. A series of securing-lugs a' are formed on the end plate A^2 . Arranged diametrically at opposite points in the peripheral wall of the cylinder are openings P, the same being slightly eccentric to the axis of the cylinder—that is to say, extending below the axis a distance greater than above the same. The openings are hooded by hoods D, having downwardly-curved outer walls, flat side walls d and open, unobstructed bottoms, as shown in Figs. 5 and 6. The lower margins of the hoods extend slightly below the lower walls of the opening P for purposes presently to be stated.

B designates a cylindrical member conveniently of a diameter less than the diameter of the flange A^4 , into the end of which the member B is fitted. This member B constitutes a receiving-chamber and is provided with diametrically oppositely-arranged pins d' , engaging in the L-shaped slots a of the flange A^4 , whereby a detachable connection is formed between the two members. The member B

has an opening C in its rear upper portion, closed by a hinged lid *c*.

E designates a shaft mounted in a boss *e'*, formed on the end wall *b* of the cylinder B. The opposite end of the shaft is projected through the cylinder A and its end is located within the bracket *A*³ and there supported and held by a pivot-screw K, projecting through the end wall *a*² of the bracket, the same being held in a fixed position by a set-nut *k*. The end of the screw is pointed or conical and is fitted in a corresponding depression in the end of the shaft E, so that by adjusting the screw K a free, delicate, and sensitive mounting of the shaft is secured. It is to be understood that any other or desirable means of mounting the shaft can be employed.

Mounted on the shaft E within the cylinder A is a shutter consisting conveniently of a plate Q, through which the shaft E passes eccentrically. This plate is located adjacent the wall of the cylinder A, serving to close the opening in the wall. The plate carries on its outer end shutter-plates Q' of segmental formation, the curvature of which corresponds, essentially, with the curvature of the inner wall of the drum or casing A. These shutter-plates are positioned at points directly opposite each other and extend a distance below the axis of the shaft E greater than above the same and their vertical widths are greater than the widths of the openings P, while their length is greater than the length of the openings. By this construction and arrangement when the plate Q is in a horizontal position, as shown in Fig. 5, the shutters will be in a position to close both openings P. To properly support the free ends of the shutter members, spokes or rods *r* may be employed, as shown in Fig. 8, the same extending from a hub R, rigid on the shaft E. A somewhat similar construction is shown in Fig. 9, wherein the hub *q* is connected with the plate Q and the supporting spokes or rods *r'* are extended from the plate to the shutters.

N designates a collar fixed on the outer projecting end of the shaft E, from which extends an angular standard N', which in turn carries on its lower end two vanes O, which are conveniently of concavo-convex formation having their convex surfaces arranged back to back. It has been found that in arranging the vanes that if they are arranged slightly at an obtuse angle relative to each other their action is more satisfactory and positive. This arrangement is shown in Fig. 1 of the drawings. To limit the movement of the regulating-vane, buffers L are secured on the plate A' on opposite sides of the center.

It may be found convenient in some cases to set the shutters against actuation to close the openings in the cylinder, especially when the exhausting apparatus is employed at an

elevated point—such, for instance, as in the deck of a railway-car. To accomplish this, suitable flanges G are secured fixedly to a collar *e*, rigid on the protruding end of the shaft E, and to associate therewith a locking-pin H, whose upper end is arranged to fit between the fingers G. This is accomplished by forming a lug *h* on the end wall *b* of the cylinder B and securing a suitable bracket I on a fixed part of the structure or car and an interposed spring *h*² between the lug *h* and a fixed projection or collar *h'* on the rod H, the tendency of the spring being to force the rod H downward below the fingers G. To force the rod H upward, a pivoted cam-lever J is employed, its squared upper end bearing against a flat-headed knob J' on the rod H, as shown in Fig. 7, wherein the lever J is represented as being forced down to force the rod H up. By turning the lever in the opposite direction rod H is forced down by the spring, freeing the fingers G.

It may be found convenient to set the shutters at a predetermined point, so as to vary the extent of exhaust-openings. To accomplish this, an arm F is projected from the sleeve *e* and is provided with a set-screw *f* or other convenient means, the end of which impinges against the end wall *b* and will thereby hold the shaft E in various positions of adjustment. Other suitable means can be employed for this purpose.

In Fig. 10 is shown a slightly-modified form of structure, wherein the vane O is located directly below the drum A, the standard N' being extended downward and thence inward below the drum. This form may be convenient when it is desirable to have the vane at a point to avoid what in some instances may be regarded as an objectionable projection.

In operation it has been found that by forming hoods in the manner described and locating them to extend below the openings and to intercept or prevent the air from entering directly into the cylinder that a very positive and satisfactory exhaust can be secured when the openings are open. As far as I now know, the air striking the deflectors or hoods D creates a current of air, which moves from within the ventilator to without through the open bottoms of the hoods, while at the same time all foreign matter—such as cinders, snow, rain, &c.—is prevented from being driven or entering the cylinder. It has been found that the result of exhausting is accomplished more promptly and more efficaciously by locating the openings eccentric to the cylinder—that is, below the axis—and by having a relatively large chamber within the cylinder, into which the air passes, exhausts from the compartment take place very rapidly and promptly as soon as the shutters are opened.

Manifestly it is desirable to have the shutters work automatically. To accomplish this,

the vane O is employed, which as soon as the pressure becomes sufficient will be deflected, as shown in Fig. 6, thereby opening the shutters by shifting the same to points beyond the openings P. The moment the pressure ceases the shutters by the weight of the vanes assume their normal positions, closing the openings, thereby preventing cold air from entering the compartment in the form of direct drafts or blasts. It is to be understood that the lids *c* can be dispensed with and are only useful when it is desirable to permanently close the openings.

In applying the device or structure it may be placed on a suitable support, either the base of a window, in the vertical walls of a deck of a car, or in a member or wall especially provided. The flange A⁴ is projected through the support, and the cylinder is connected by screws or other means passed through the ears *a'*.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. A ventilator comprising in its structure a casing having oppositely-arranged openings, means within the casing normally held in position for closing both openings and means without the casing actuated by air-pressure to open both the openings.

2. In a ventilator the combination with a casing having exhaust-openings therein, of a movable element within the casing normally arranged and held to close the openings and means located without the casing actuated by air-pressure for adjusting said element to cause the same to disclose the openings.

3. In a ventilator the combination with a casing having openings in different sides, means normally held in position for closing both openings and a vane connected with said closing means for adjusting the same to open the openings upon the presence of external air-pressure.

4. In a ventilator the combination with a casing having side openings, hoods extending across the openings, shutters for the openings normally held in position to close the openings and means actuated by air-pressure to open the openings.

5. In a ventilator the combination with a casing having side openings, hoods surrounding the openings and having open lower faces, shutters normally closing the openings and means without the casing for adjusting the shutters to vary the size of the openings.

6. In a ventilator the combination with a casing having openings in opposite sides, of a shutter member comprising oppositely-arranged plates arranged to normally project over the openings and means connected with

the shutter for adjusting the shutter to disclose both openings.

7. The combination with a casing having two exhaust-ports, of shutters for normally closing the ports, a vane for adjusting the shutters and means for limiting the movement of the vane.

8. The combination with a casing having oppositely-arranged ports, of hoods extending over said ports having open lower faces only, means for closing both ports and a device actuated by air-pressure from without for actuating said closing means.

9. In a ventilator a casing having hooded side ports oppositely arranged a shutter for simultaneously closing both ports, and means acting automatically for positioning the shutters to close the ports.

10. In a ventilator a casing having oppositely-arranged ports, hoods projecting over the ports having closed sides, ends and top walls and means acting automatically for closing both ports simultaneously.

11. In an exhaust-ventilator the combination with a casing having ports in opposite sides, means acting automatically for varying the extent of the openings in the casing and hoods projecting over the ports.

12. The combination with a casing, having openings therein, a shaft projecting through the casing, a shutter mounted on the shaft and arranged to simultaneously open the openings and means without the casing connected with the shaft for turning the same to vary the position of the shutter.

13. The combination with a casing having openings therein, of a shutter for closing the openings, a vane without the casing connected with the shutter and comprising two angularly-arranged concave disks.

14. In a ventilator the combination with a casing having openings, a shaft, shutters carried by the shaft, an angular standard secured to the shaft and vanes on the standard.

15. In a ventilator the combination with a casing having openings therein, of a shutter for the openings comprising a plate, curved shutter portions on the plate and rods for supporting the outer ends of the shutter-plates.

16. In a ventilator the combination with a casing having openings therein, of a shutter for the openings, a shaft and connections between the shaft and the shutters comprising rods; substantially as described.

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

GILBERT F. WILLIAMS.

Witnesses:

GEO. H. DENT, Jr.,
H. L. PERRINE.