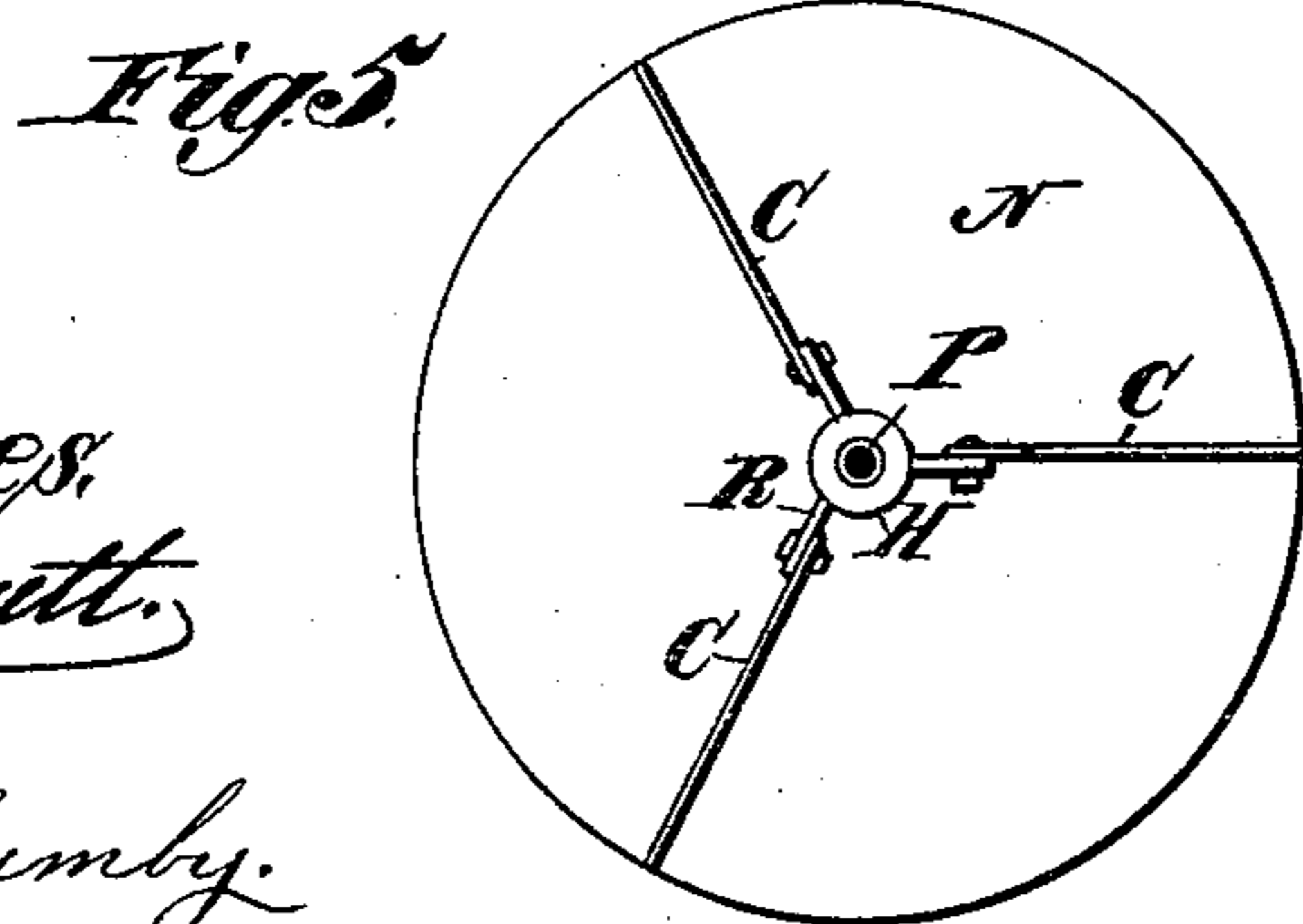
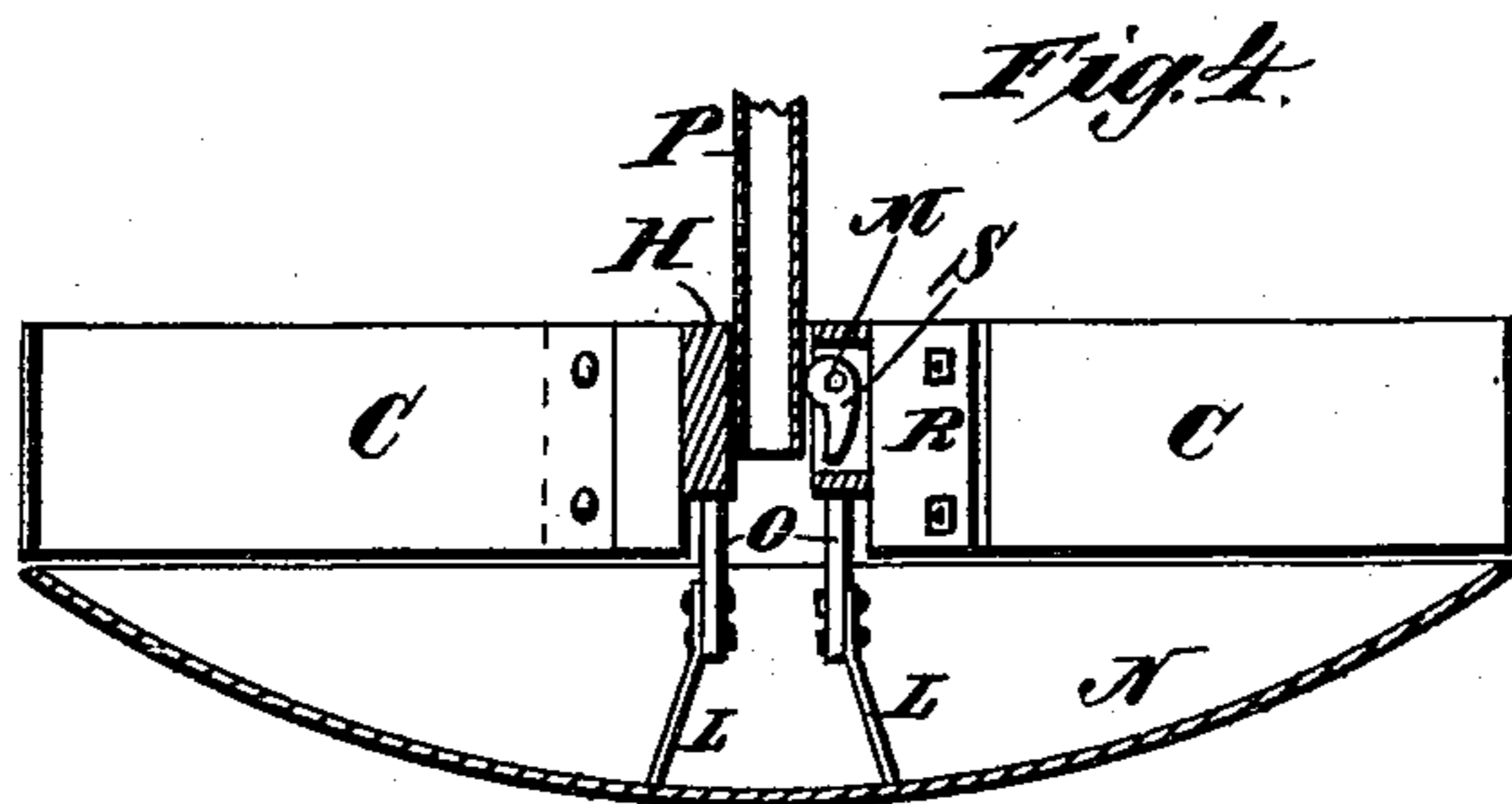
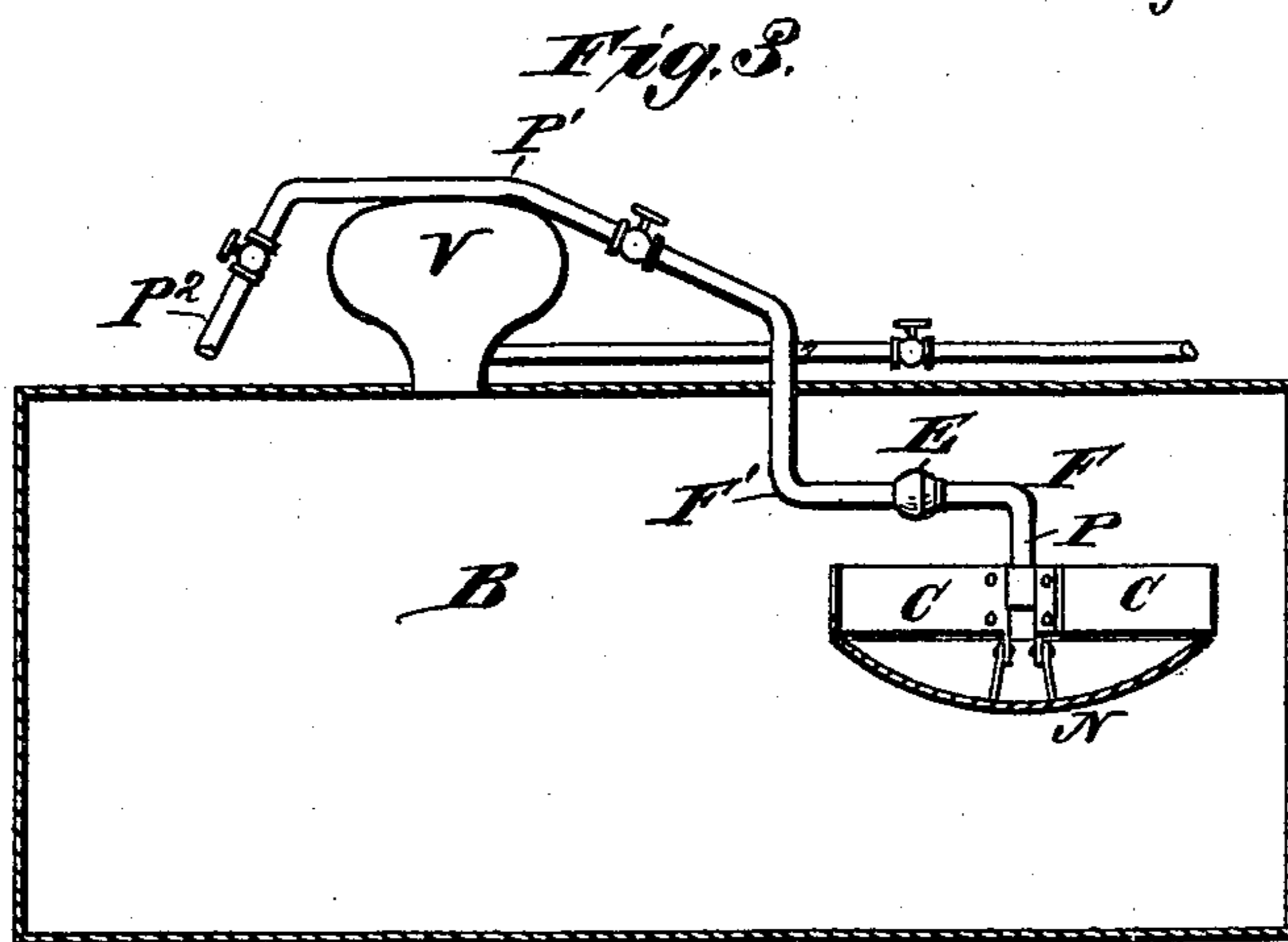
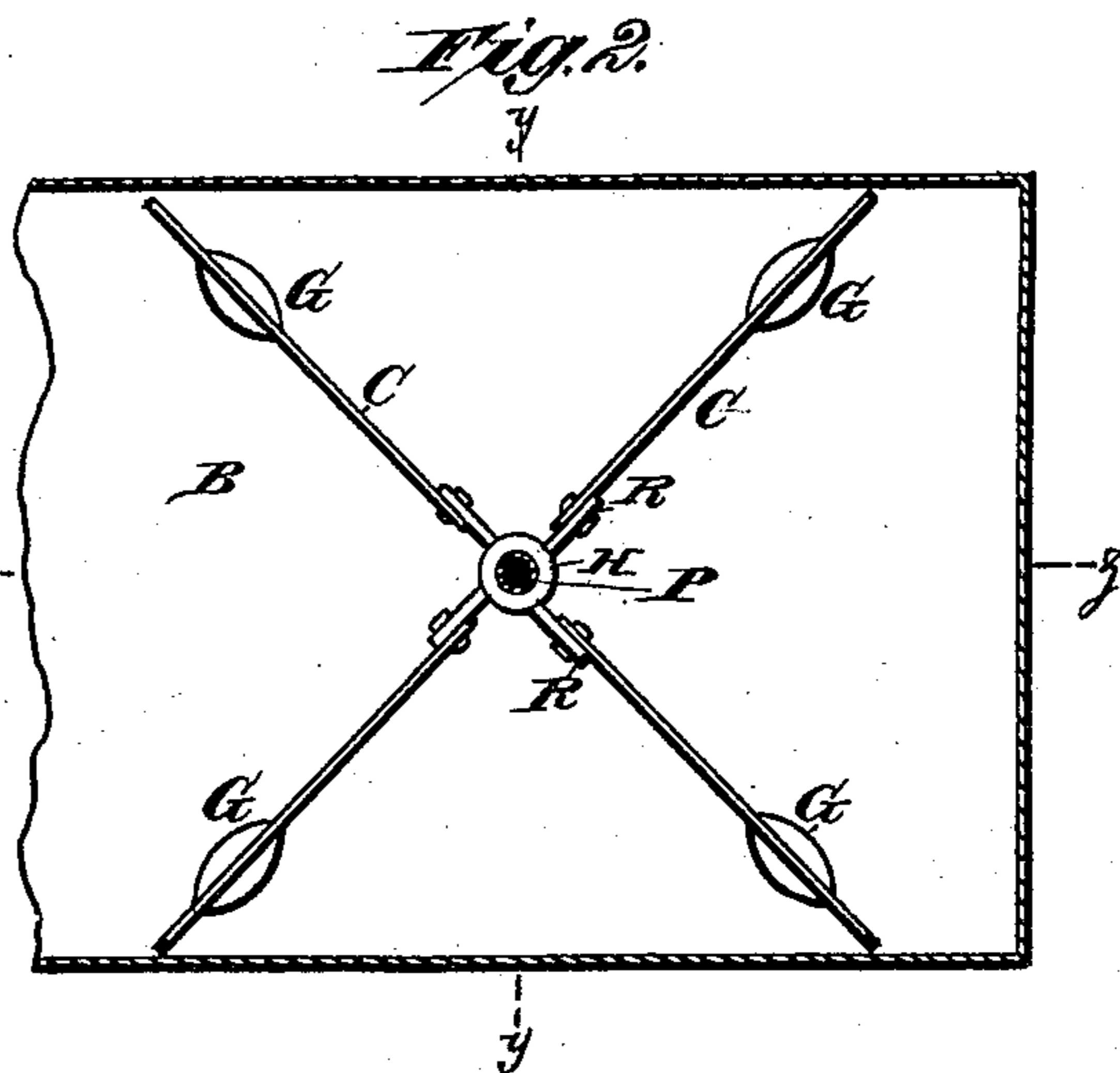
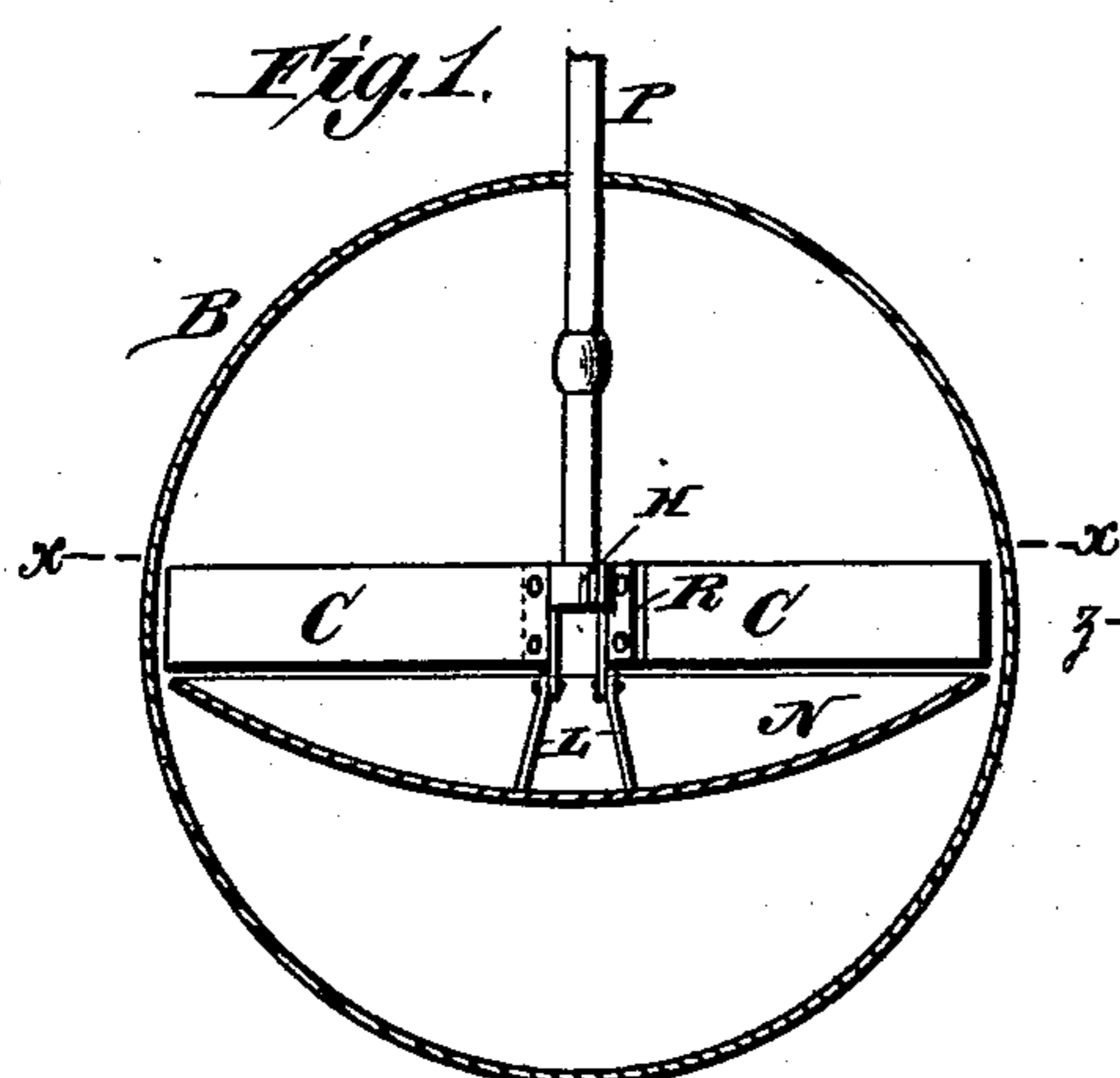


(No Model.)

G. R. FORD.  
AUTOMATIC BOILER CLEANER.

No. 426,795.

Patented Apr. 29, 1890.



Witnesses:  
*Robert G. Smith.*

*Dennis Sumby.*

Inventor:  
*George R. Ford.*  
By *Edward Taggart.*  
Atty.

# UNITED STATES PATENT OFFICE.

GEORGE R. FORD, OF GRAND RAPIDS, MICHIGAN.

## AUTOMATIC BOILER-CLEANER.

SPECIFICATION forming part of Letters Patent No. 426,795, dated April 29, 1890.

Application filed October 31, 1889. Serial No. 328,862. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE R. FORD, a citizen of the United States, residing at the city of Grand Rapids, in the county of Kent and State of Michigan, have invented a certain new and useful Automatic Boiler-Cleaner, of which the following is a specification.

My invention relates to a new and useful device for collecting dirt and solid particles which accumulate within a steam-boiler, and for expelling the same from the boiler, the object being to collect or direct toward a given point all the solid matter which may float upon the water, regardless of the direction of the water-current within the boiler, and to remove such solid particles from the boiler, which object I accomplish by the features of construction and the combination or arrangement of parts hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 shows a vertical cross-section on line *y y* of Fig. 2. Fig. 2 shows a longitudinal horizontal section of the same on line *x x* of Fig. 1. Fig. 3 shows a longitudinal vertical section on line *z z* of Fig. 2. Fig. 4 shows a vertical sectional view of the boiler-cleaner removed from the boiler, such view being on an enlarged scale; and Fig. 5 shows a modified form of the parts shown in Fig. 4.

Similar letters refer to similar parts throughout the several views.

B represents the boiler.

H represents a hub provided with four wings. (Shown in Fig. 2 by R R, &c.) To these wings are attached extension-plates C C C C. These plates are made preferably of thin metal, and are attached to the wings R R by bolts, screws, or by other suitable means, the same being adjustable lengthwise upon the wings in order to adapt them to boilers of different sizes. They are also readily attached and detached from the wings, so that plates of different lengths can be applied, if required. The hub H, which supports the wings, is hollow, and in the example of my invention which I have shown is provided with an eccentric pivoted within the hub, which eccentric is shown in Fig. 4 by S and its pivot by M.

P is a tube extending into and preferably

to the lower side of the hub. The eccentric S is used merely for the purpose of attaching the hub and the parts which are sustained by it to the tube P. The position of the eccentric shown in Fig. 4 is the position which it occupies when performing the function of attaching the hub to the tube.

G G G G are four floats constructed of any suitable material designed to hold the guide-wings, which consist of the plates C C C C and the wings R R R R, in the proper position within the boiler. In practice I make the plates and wings about six inches in width, and support them in the boiler so that the water-line will pass between their upper and lower surfaces, preferably at about the middle point. Instead of using four radial arms, three may be used, but in my opinion at least four are preferable.

The pipe P, in my preferred form, extends upward, and is provided with an elbow, as F, a flexible coupling-joint, as E, and another elbow, as F'. The flexible joint allows the pipe P and the radial arms to rise and fall with the water, thus retaining the most desirable position for receiving all the floating particles produced by the boiling of the water. For the purpose of more effectually collecting the solid particles I provide a pan N, which is supported below the wings of the apparatus in order to receive any floating particles which are not carried upward and expelled from the boiler through the pipe P.

L represents projections upon the pan, which are attached by means of bolts or in any other suitable manner to the lugs O O. The lugs O O project down from the hub or radial arms, and the pan is attached to said lugs by means of bolts, screws, or other suitable attachment. This pan N is preferably shallow, and, coming in contact with the wings at or near their outer ends, forms a receptacle which retains the solid particles in such close proximity to the discharge-pipe P that as they accumulate within the pan they will be drawn out and expelled. The flexible joint E may be constructed as a ground joint, or in any other suitable manner, which will allow the wings to rise and fall with the rising and falling of the water in the boiler. In some boilers, where the water is always

kept at the same level or substantially the same level; the elbow and joint may be dispensed with and the pipe extended perpendicularly from the hub through the upper surface of the boiler. The arrangement of the settling-basin outside the boiler and methods of discharging the solid particles therefrom do not differ from those in use, one form of which is shown by V and connecting-pipes P' and P<sup>2</sup>.

In my experience with steam-boilers I have found that the water-currents in boilers are variable, and that in order to effectually arrest the same it is necessary to provide means which will convey the same to a given point, whatever be the direction of such currents, and my invention is constructed with such object in view.

Having thus described my invention, what I claim to have invented, and desire to secure by Letters Patent, is—

1. The combination, with a steam-boiler, of a cleaner consisting of a central hollow hub, the three vertically-arranged plates radiating horizontally in right lines in different directions direct from the hub, terminating in juxtaposition to the boiler-shell and partially submerged throughout their length to deflect the water-currents, irrespective of their direction, to the hollow hub, a basin supported beneath the bottom edges of the radiating vertically-arranged plates, and a discharge-pipe rising vertically from and communicating through the hollow hub with the water in the boiler, substantially as described.

2. The combination, with a steam-boiler, of a cleaner consisting of a central hollow hub having the three wings radiating direct therefrom, the three vertically-arranged plates bolted, respectively, to the said wings, radiating in right lines in the plane of the wings

and partially submerged to deflect the water-currents, irrespective of their direction, to the hollow hub, and a discharge-pipe rising from and communicating through the hollow hub with the water in the boiler, substantially as described.

3. The combination, with a steam-boiler, of a cleaner consisting of a central hub having three wings radiating horizontally direct therefrom, the three vertically-arranged plates respectively attached to the wings, radiating horizontally therefrom and partially submerged to deflect the water-currents, irrespective of their direction, toward the central hub, a basin supported beneath the bottom edges of the vertically-arranged plates, and a discharge-pipe, substantially as described.

4. The combination, with a steam-boiler, of a cleaner consisting of a central hollow hub having pendent projections or brackets on its lower end, the three vertically-arranged plates radiating in right lines in different directions from the hollow hub and partially submerged to deflect the water-currents, irrespective of their direction, to the hollow hub, a basin suspended beneath the bottom edges of the vertically-arranged plates by the pendent projections or brackets on the said hub, and a discharge-pipe rising vertically from and communicating through the hollow hub with the water in the boiler, substantially as described.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

GEORGE R. FORD. [L. S.]

Witnesses:

ARTHUR C. DENISON,  
HARRY P. VAN WAGNER.