

No. 719,424.

PATENTED FEB. 3, 1903.

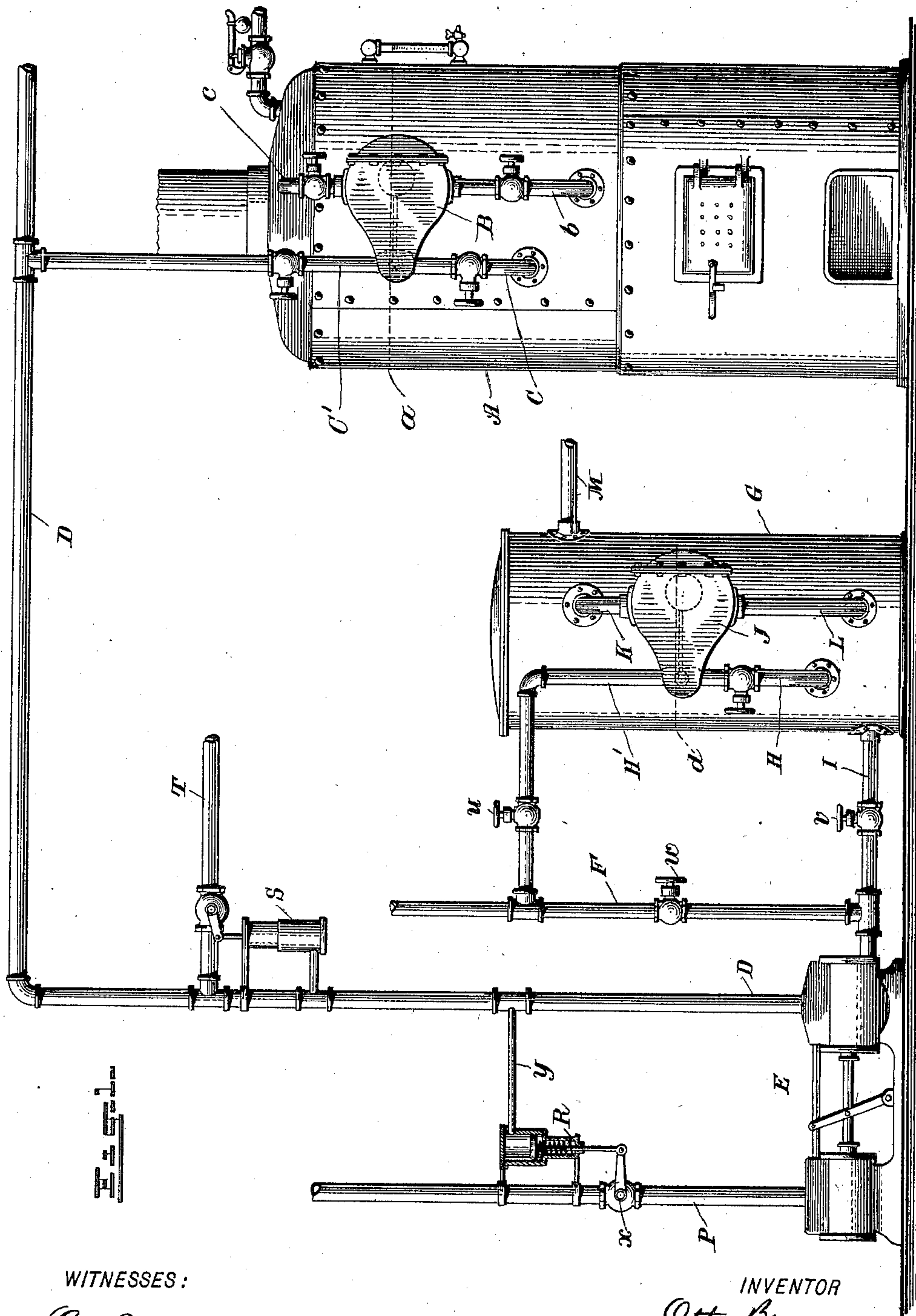
O. BERGER.

DEVICE FOR MAINTAINING THE WATER LEVEL IN BOILERS.

APPLICATION FILED AUG. 30, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

Geo. W. Weyl
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INVENTOR

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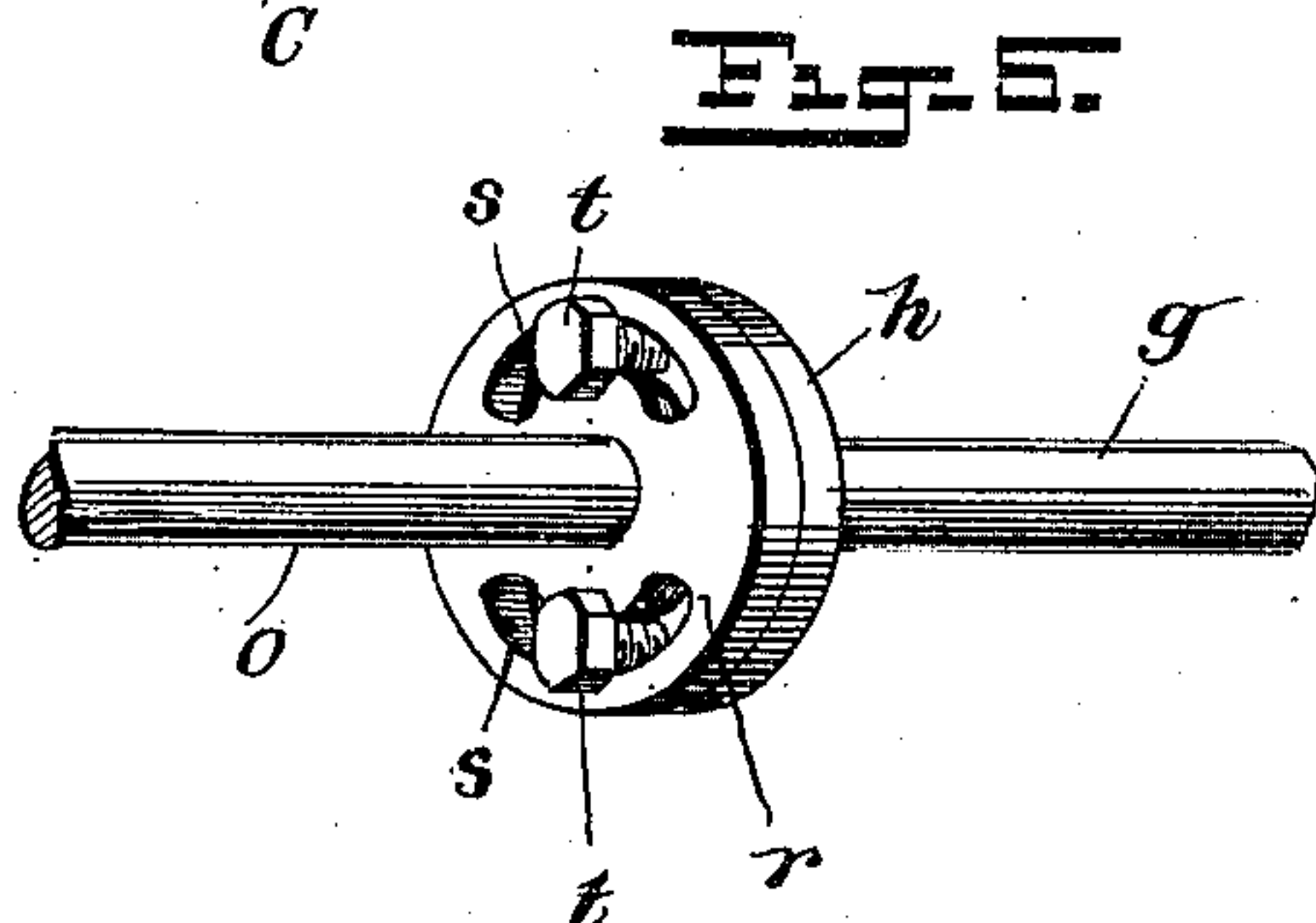
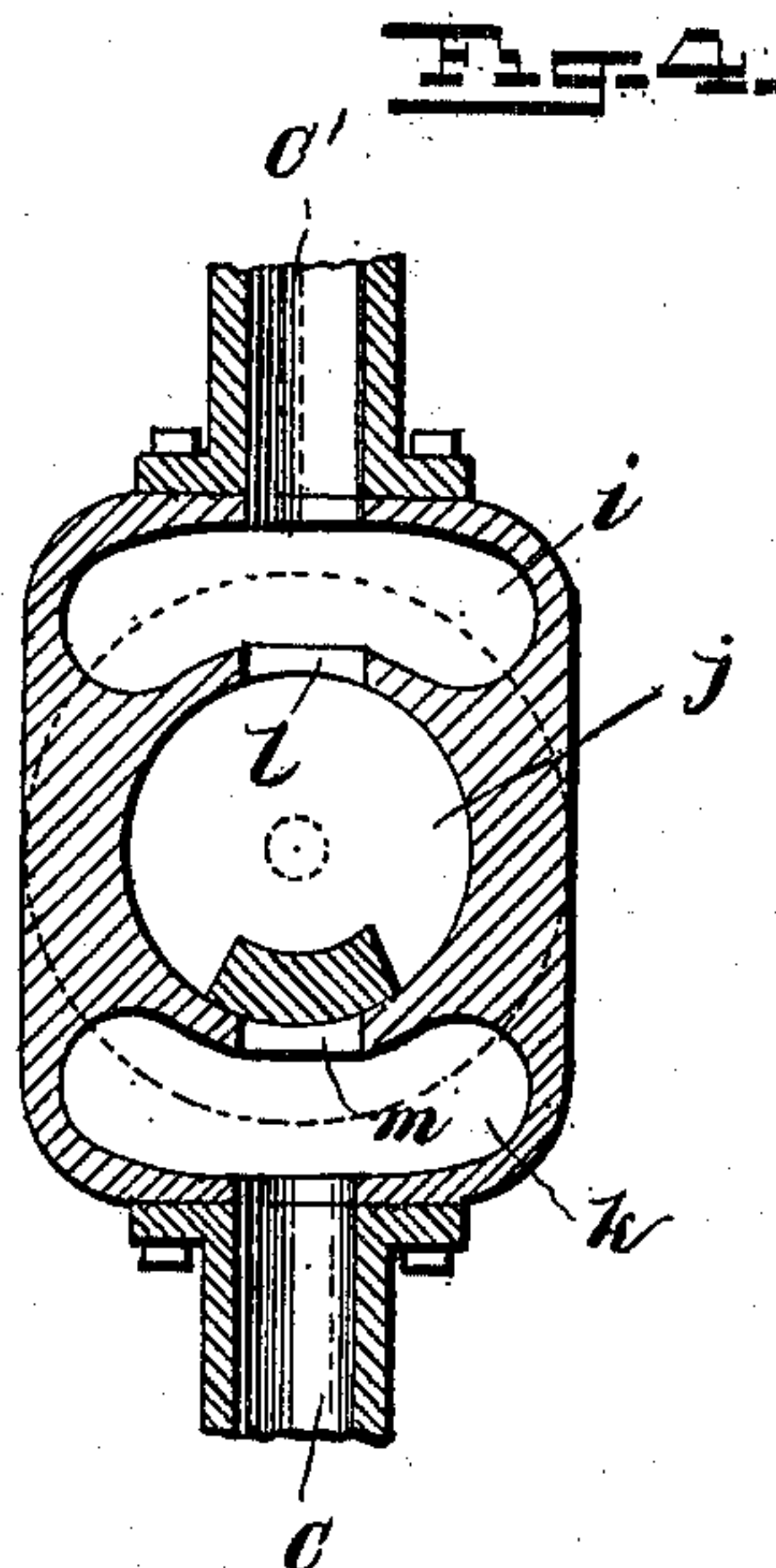
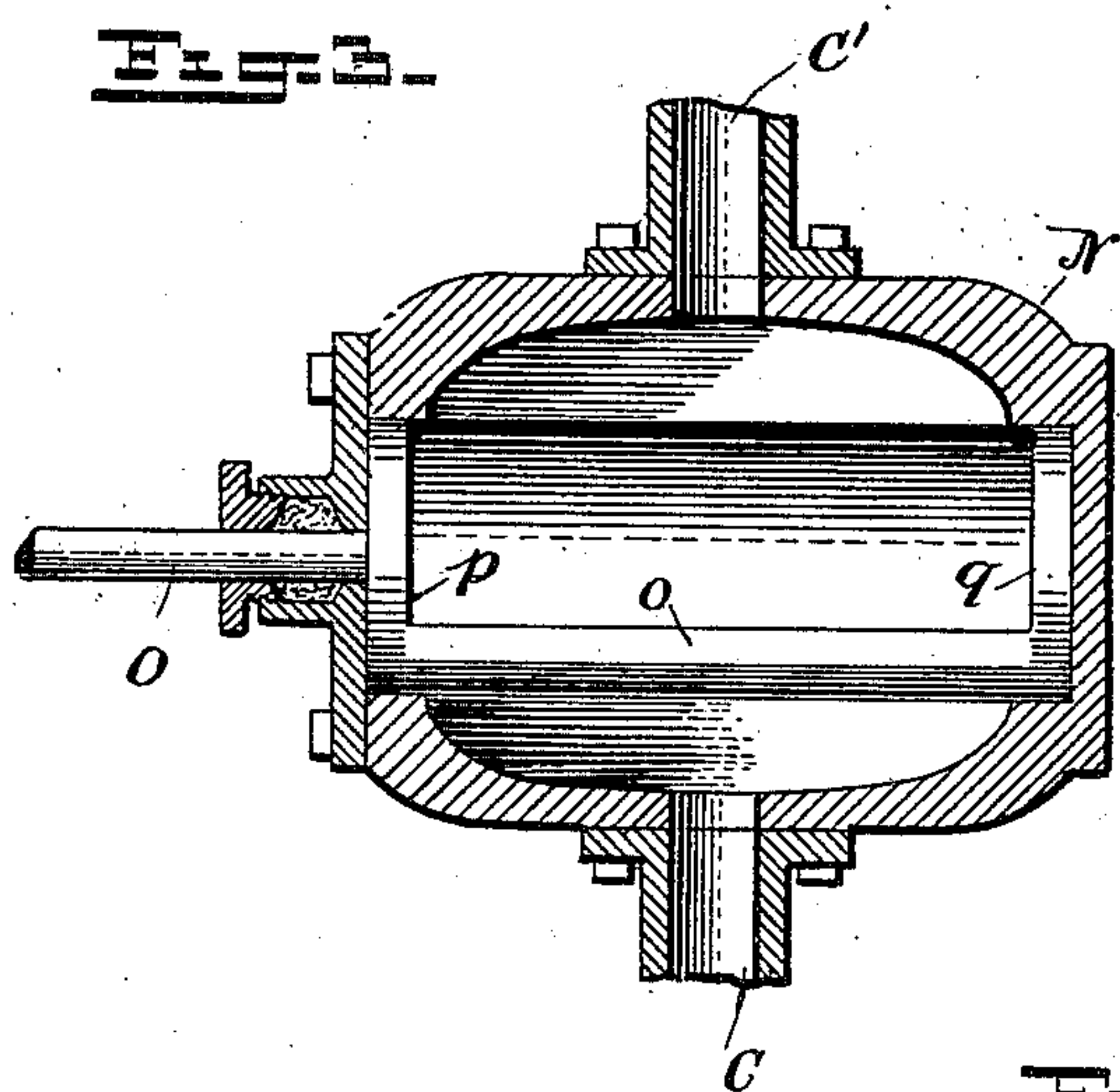
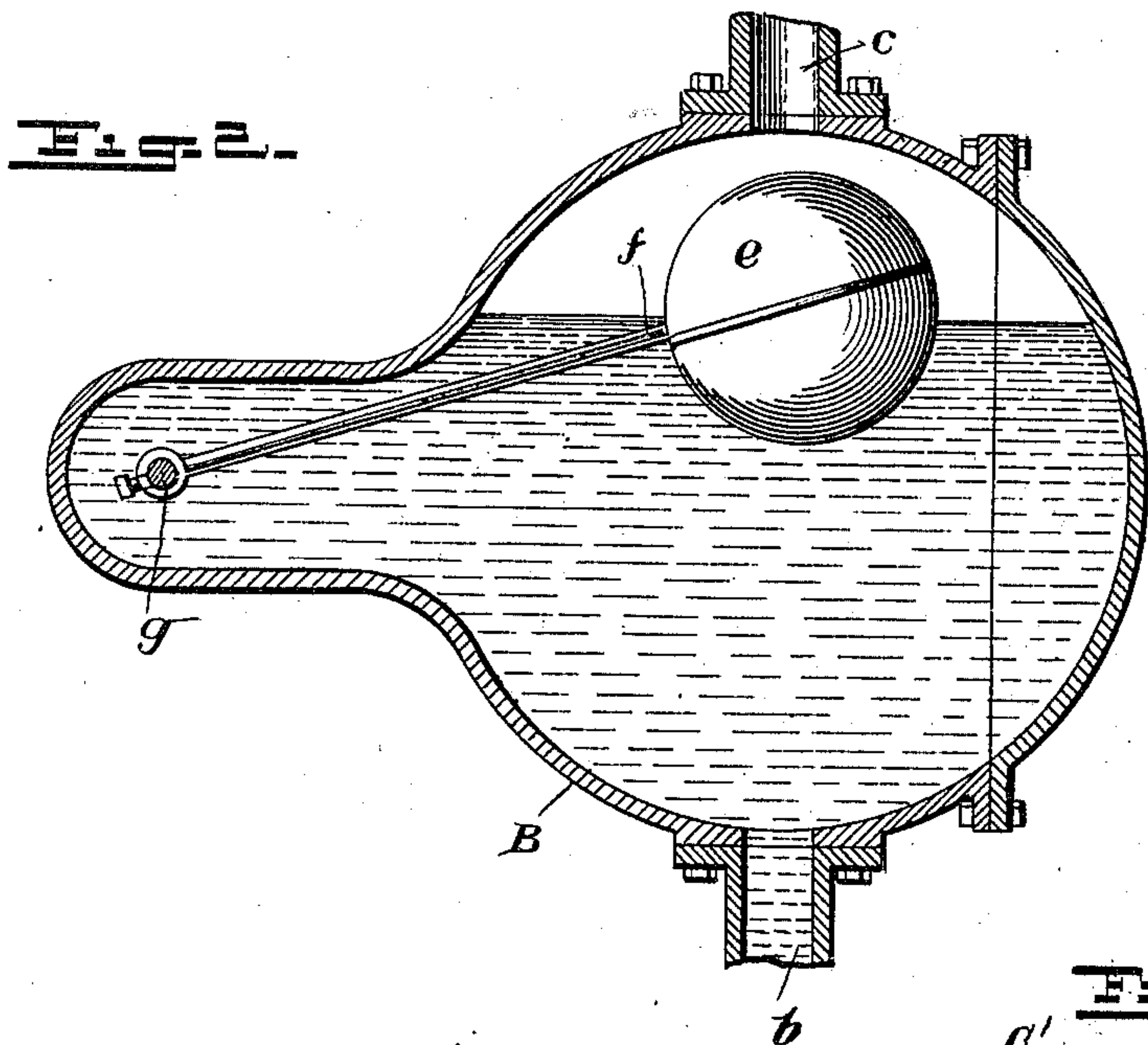
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DEVICE FOR MAINTAINING THE WATER LEVEL IN BOILERS.

APPLICATION FILED AUG. 30, 1901.

NO MODEL.

2 SHEETS—SHEET 2.



WITNESSES:

Geo. W. Naylor
S. Abraham

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UNITED STATES PATENT OFFICE.

OTTO BERGER, OF NEW YORK, N. Y.

DEVICE FOR MAINTAINING THE WATER-LEVEL IN BOILERS.

SPECIFICATION forming part of Letters Patent No. 719,424, dated February 3, 1903.

Application filed August 30, 1901. Serial No. 73,781. (No model.)

To all whom it may concern:

Be it known that I, OTTO BERGER, a citizen of the United States, and a resident of New York, borough of Manhattan, in the county of New York and State of New York, have made and invented certain new and useful Improvements in Devices for Maintaining the Water-Level in Boilers, of which the following is a specification.

My invention relates to a device for maintaining the water-level in steam-boilers, the object being to provide a system of pipes and valves for such purposes which shall be simple and cheap to install and which shall also operate automatically and with certainty.

With these and other ends in view my invention consists in certain novel features of construction and combination of parts, as will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in elevation of a steam-boiler having my improvement connected therewith. Fig. 2 is a sectional view of the receptacle and float designed to operate the valve in the water-supply pipe. Fig. 3 is a longitudinal sectional view of the valve. Fig. 4 is a vertical sectional view of the same. Fig. 5 is a perspective view showing the manner of adjustably securing the valve-stem to the rod for operating the same.

Referring to the drawings, A represents a steam-boiler of any desired style and size, the water-level to be maintained therein being represented by the dotted line *a*. Near the boiler is located the receptacle B and is connected therewith by means of a pipe *b*, leading from the bottom of the receptacle to the water end of the boiler and also by means of the pipe *c*, leading from the upper side of the receptacle to the upper end or steam drum of the boiler, the effect of this arrangement being to retain the same water-level in both the boiler A and receptacle B. To the water end of the boiler is also connected the lower end of the water-supply pipe C C', the upper end of which is connected with the pipe D, leading to pump E, the latter in turn being connected with the pipe F, leading to a hydrant or some other suitable source of supply, the object being, as hereinafter described, to lift or force the water by means of the pump E,

operating automatically from the pipe F to the pipes D and C into the boiler when the water falls below a certain level. When, however, it is desired to return to the boiler the water of condensation, I provide a tank G, into the lower end of which leads the pipe H H', communicating with the pipe F from the hydrant, and out of the lower end of which tank leads the pipe I, communicating with the lower end of said pipe F, the latter, as before described, being connected with the pump E.

Near the tank G is located a receptacle J, similar in construction and operation to the receptacle B, a pipe K leading from the upper end of said receptacle J into the upper end of the tank G and a pipe L leading from the bottom of said receptacle J into the lower end of said tank, the purpose being to keep or maintain the same water-level in the tank G as in the receptacle J, which level is indicated by the dotted line *d*. Into the upper end of the tank G leads the pipe M for conveying thereto the water of condensation.

In the receptacle B is contained a ball or float *e*, secured to one end of the rod *f*, the opposite end of the latter being secured to the rod or shaft *g*, having its bearings in the sides of the receptacle B, one end of said rod or shaft *g* extending out beyond the receptacle and having secured thereon the disk *h*, the said shaft being rocked or turned as the ball or float *e* rises and falls with the water-level in the receptacle.

In the supply-pipe C is located a valve N, said valve consisting of a casing preferably formed as illustrated in Figs. 3 and 4 of the drawings—that is, with an upper chamber *i*, a middle or valve chamber *j*, and the lower chamber *k*—the upper chamber communicating with the valve-chamber by means of the opening *l* and the lower chamber with the middle or valve chamber by means of the opening *m*, which latter opening *m* is adapted to be opened or closed by means of a valve, said valve consisting of the end disks *p q* and the valve proper, *o*. To this valve is secured one end of the valve-stem O, the opposite end of the stem having secured thereto the disk *r* of a size similar to the disk *h*. These disks are provided with curved slots or openings *s*, through which openings pass bolts *t*, whereby the same are adjustably secured together,

this construction and arrangements of parts allowing the rod or shaft *g* and valve-stem *O* to be so adjusted with relation to each other that the valve may be opened to any desired extent when the shaft *g* is turned or moved by means of the ball or float *e*.

From the foregoing it will be understood that as the water in the boiler lowers by reason of leakage, escape of steam, &c., the ball or float *e* will also lower, thereby turning the shaft *g*, to which it is indirectly connected, and through the medium of the valve-stem *O* opening the valve *o*, the effect being to allow the water to pass from the pump *E*, through the pipes *D C C'*, into the boiler *A* until such time as the float is raised sufficiently to close the valve, the pump drawing the water through the pipe *F*, which, as before described, leads to the hydrant or from the tank *G*, in which latter event the valves *u v* will be closed and the valve *w* opened.

The pump *E* may be of any desired style or pattern and supplied with steam through the pipe *P*, to which is attached the valve *x*, operated by the pump-governor *R*, the latter being connected with the pipe *D*, leading from the pump, by means of the pipe *y*, the effect being that when the valve *o* is closed by means of the ball or float *e*, as before described, the back pressure of water in the pipe *D* will cause the governor to cut off the supply of steam to the pump *E*, and thereby operate to stop the latter. When the water in the boiler lowers, as before described, the pressure in the pipes *D* and *y* will be relieved, the governor thereupon opening the valves *x* in the steam-supply pipe, and thereby cause the pump to start and again raise the water to the proper level in the boiler.

To the pipe *D* is secured a safety-valve *S*, which should the pressure become too great in said pipe *D* will open and allow the water to be discharged through the exhaust-pipe *T*.

In the receptacle *J* is contained a float similar to that in the receptacle *B*, and is connected to a valve secured to the pipe *H H'*, similar in all respects to the valve already described in connection with the receptacle *B*, whereby a sufficient quantity of water is always maintained in the tank *G* wherewith to supply the boiler when desired, this tank being used, however, in such cases only where it is desired to trap the water of condensation from the pipes or radiators. As such water of condensation is not always sufficient to supply the boiler, the valve connected with the pipe *H H'* will be opened by the float dropping or falling in the receptacle *J*, thereby allowing the water to pass down through the pipes *F H H'* into the tank *G* (the valve *w* being

closed) until such time as the water rises to a sufficient height in said tank *G* to cause the float in the receptacle *J* to close its valve, thereby shutting off further supply to said tank *G*.

It will be evident from the foregoing description that my improved device is perfectly automatic in its operations, the lowering of the water in the boiler causing the immediate opening of the valves in the supply-pipes and causing the pump to operate until the water has been brought to its proper height, whereupon the valves are closed in the supply-pipe and the pump immediately stopped.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the character described, a boiler, a water-receptacle connected to the boiler by pipes which maintain the same water-level in the receptacle and boiler, a ball-float in the reservoir, a rod to one end of which the float is attached, the opposite end of said rod being adjustably connected to a shaft by slotted disks and bolts, and a valve operated by said shaft to control the water-supply to the boiler, substantially as described.

2. The combination with a boiler, of the receptacle *B* connected therewith by pipes *b, c*, a float contained within said receptacle, a shaft *g* supported by and extending out beyond said receptacle connected with and operated by said float, a slotted disk *h*, secured to the end of said shaft *g*, a supply-pipe leading to said boiler, a valve in said supply-pipe, a valve-stem *O* secured to said valve, a slotted disk *r* secured to the end of said stem and adjustably secured to the said disk *h*, and means for supplying water to said boiler when said valve is open, substantially as described.

3. The combination with a boiler, of the receptacle *B* connected therewith and containing a float, a supply-pipe leading to the boiler, a valve in said supply-pipe and connected with and operated by said float, said valve consisting of the casing *N* provided with the chambers *i, j, k*, communicating with each other, the valve proper *o*, and end disks *p, q*, provided with slots, adjusting-bolts *f, f*, and means for supplying water to said boiler when said valve is open, substantially as described.

Signed at New York, in the county of New York and State of New York, this 24th day of August, A. D. 1901.

OTTO BERGER.

Witnesses:

GEORGE COOK,
L. ABRAHAM.