

No. 832,198.

PATENTED OCT. 2, 1906.

W. JÖRGENSEN.
REGULATING TURBINE FOR SEPARATORS.
APPLICATION FILED SEPT. 5, 1905.

2 SHEETS—SHEET 1.

Fig. 1

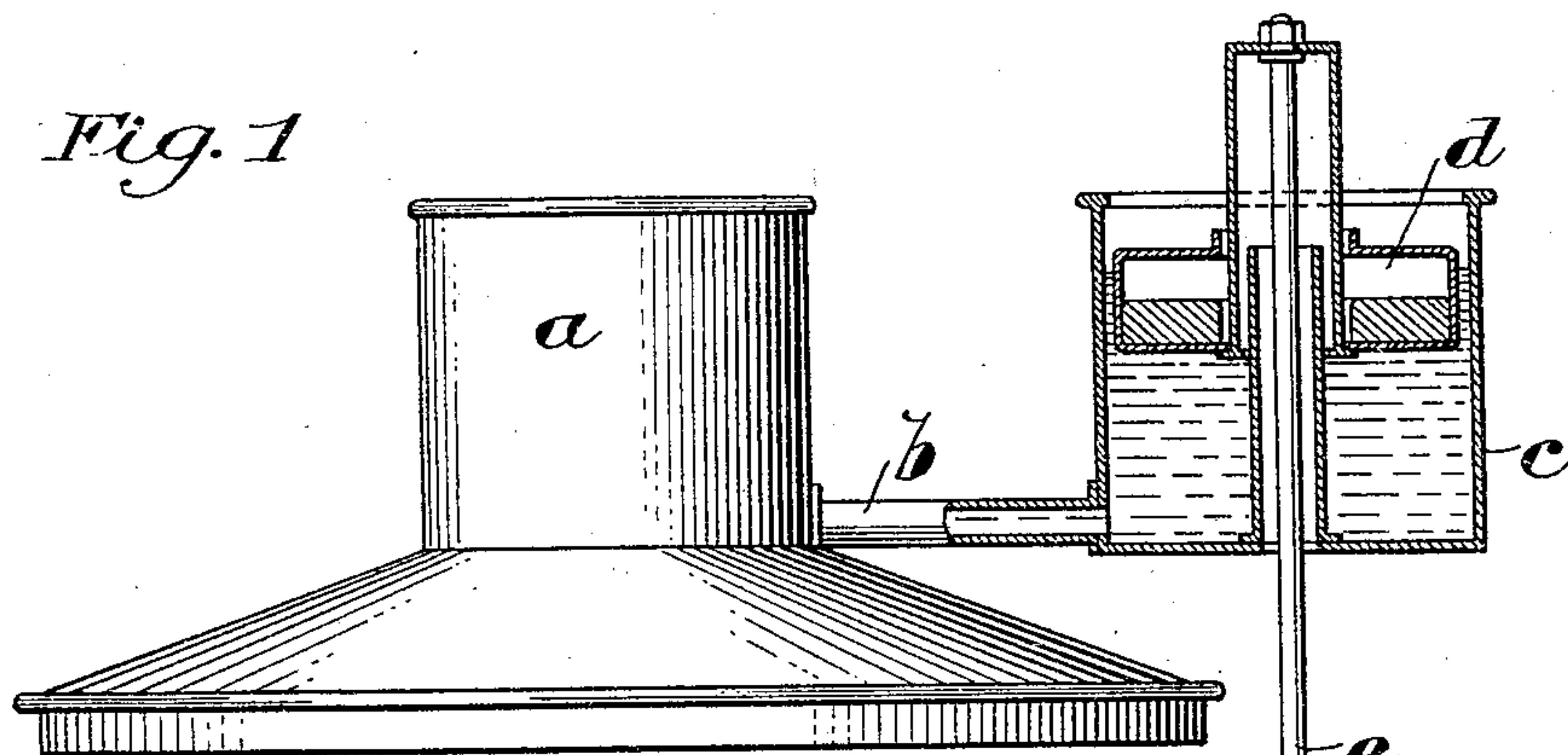
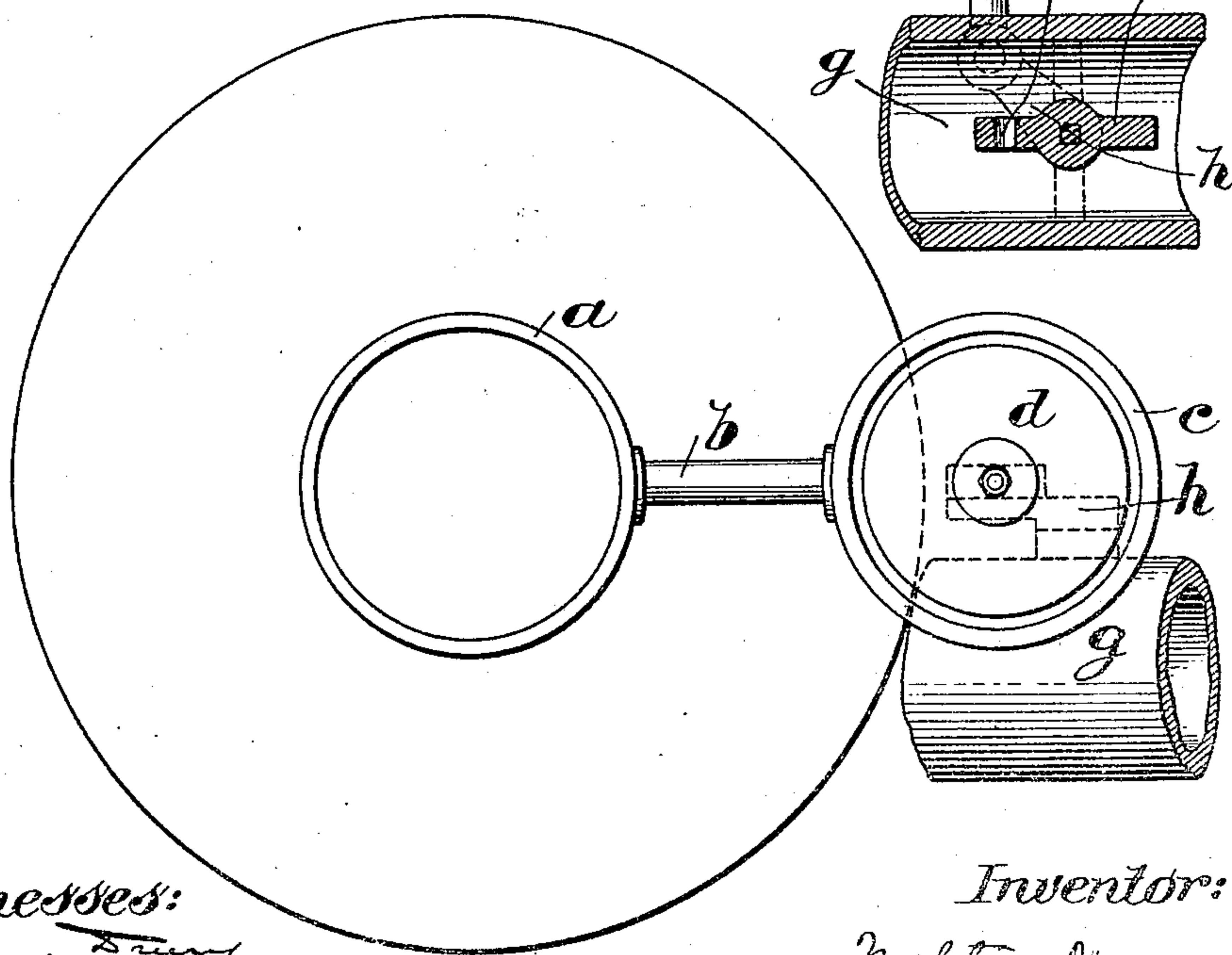


Fig. 2.



Witnesses:

Harry Trump
E. E. Wall

Inventor:

Walter Jørgensen

W. Jørgensen & Co.
Helsingør

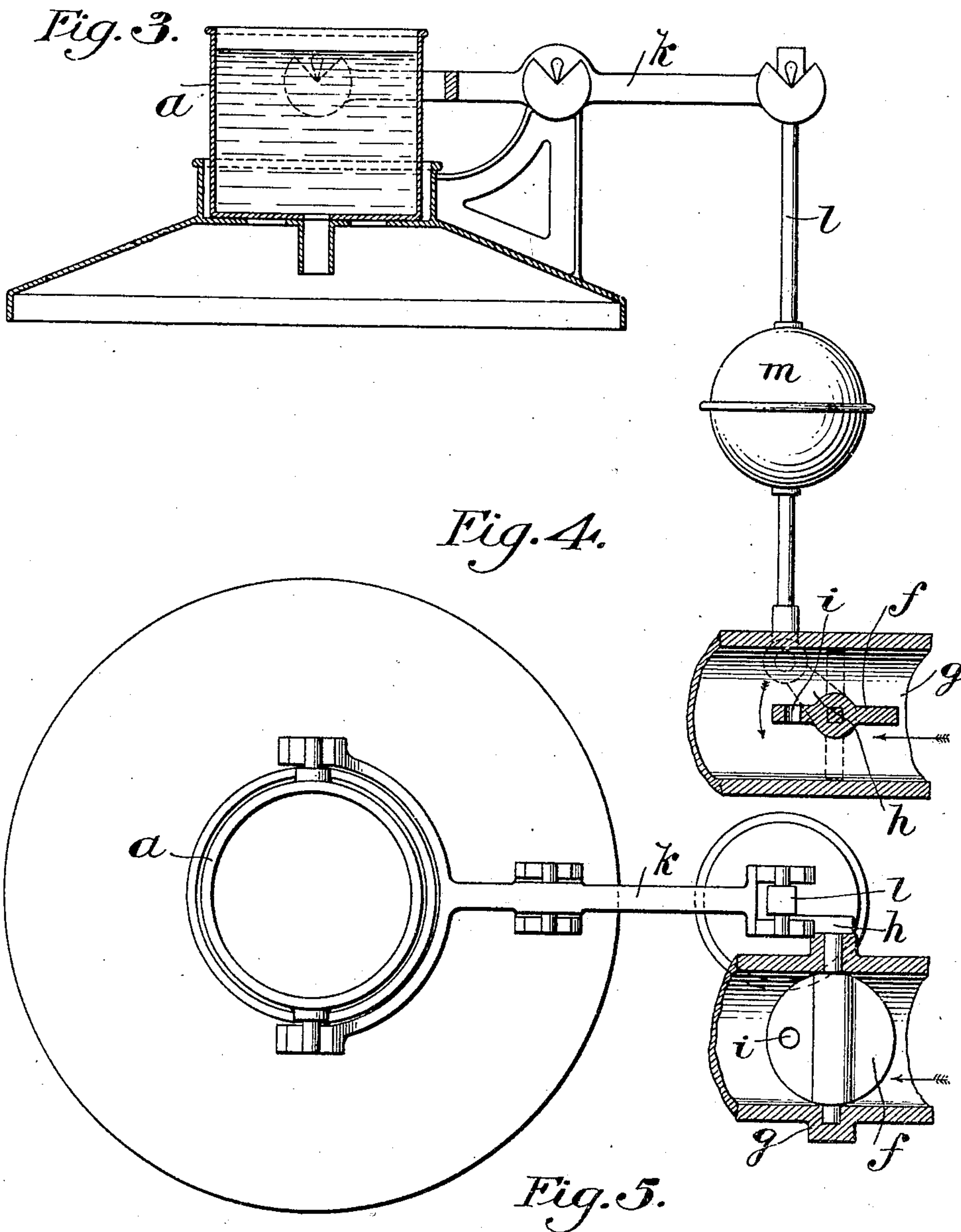
No. 832,198.

PATENTED OCT. 2, 1906.

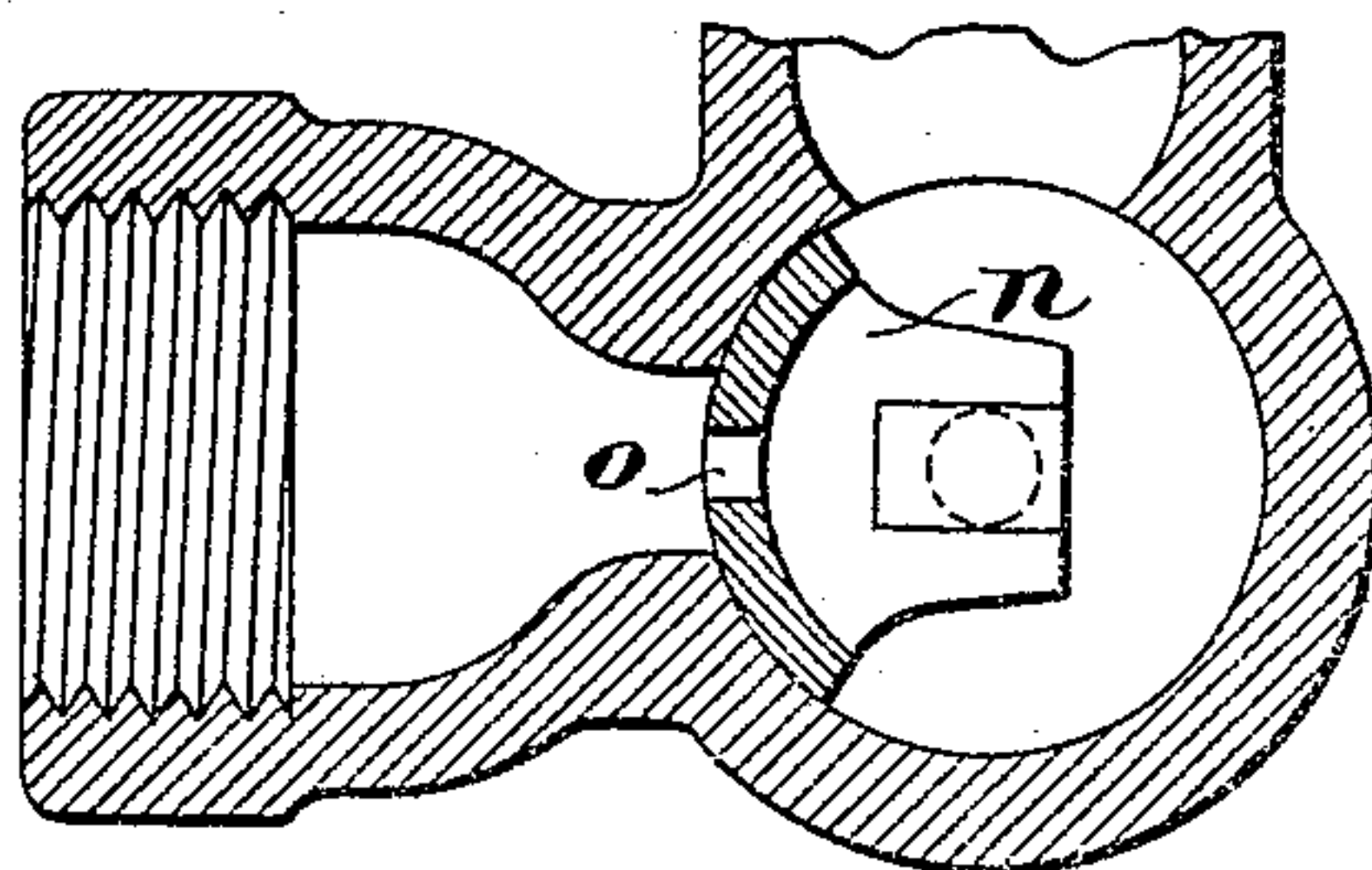
W. JÖRGENSEN.
REGULATING TURBINE FOR SEPARATORS.

APPLICATION FILED SEPT. 5, 1905.

2 SHEETS—SHEET 2.



Witnesses:
Henry Dury
E. E. Hall



Inventor:
Nalle Jørgensen
by *Handwriting* & *Handwriting*
Atty

UNITED STATES PATENT OFFICE.

WALTER JÖRGENSEN, OF STOCKHOLM, SWEDEN, ASSIGNOR TO AKTIE-
BOLAGET SEPARATOR, OF STOCKHOLM, SWEDEN.

REGULATING-TURBINE FOR SEPARATORS.

No. 832,198.

Specification of Letters Patent.

Patented Oct. 2, 1906.

Application filed September 5, 1905. Serial No. 276,971.

To all whom it may concern:

Be it known that I, WALTER JÖRGENSEN, a subject of the Emperor of Russia, residing at Stockholm, in the Kingdom of Sweden, have invented a new and useful Improvement in Regulating-Turbines for Separators, of which the following is a specification, due reference being had to the drawings which accompany and form part of this application, similar letters denoting similar parts.

With separators driven by turbines if the supply of the milk ceased and if the steam-supply was not simultaneously shut off there would arise the inconvenience that the separator, which would consequently be running empty, could acquire such a speed as would impose a dangerous strain on the strength of the rotating parts.

My present invention has for its object to avoid said risk; and it is based upon the fact that the milk-supply can of the separator or the regulating-cover must be empty before said phenomenon can occur.

My invention, speaking generally, consists in providing a controlling-valve for the steam admitted to drive the turbine and controlling that valve by the amount of milk in the supply-can or regulating-cover—i. e., controlling the position of the valve by the quantity of milk in the reservoir. I also provide an arrangement so that at no time is the supply of steam entirely cut off, but even if the valve is closed an opening is left of such size that steam will pass sufficient to maintain a constant speed with the empty bowl. This latter I can do either by preventing the valve from entirely closing or providing an opening in the valve which registers with the steam-passage when the valve is closed. Speaking specifically, I arrange a float or the like in the supply-can or in a receptacle, the regulating-cover containing the milk to be treated in the separator or in a separate receptacle communicating therewith, and is connected, by means of a rod, a cord, or the like, with a valve arranged into the steam-supply pipe. In this way the valve will be put into operation when the float sinks, and when the float has reached the bottom of the can the valve will be almost quite shut off. In another constructional form I suspend the whole receptacle of the regulating-cover on a

balance. When the receptacle is empty, the balance, which is connected with the valve, assumes such a position that the valve will be almost entirely shut off.

My invention further has also, as stated, for its object an improvement by which the steam-supply will not fully shut off, but so great a quantity of steam will be supplied as corresponds to the running of the separator empty, in order that the separator may not, if the supply-can or the regulating-cover has been emptied, stop, but maintain its speed.

The invention is shown on the annexed drawings, wherein—

Figure 1 is a side elevation, partly in section, of a structural form of my invention. Fig. 2 is a plan view of same. Fig. 3 is a side elevation of another structural form, partly in section; and Fig. 4 is a plan view of same. Fig. 5 is a sectional view of a modified form of valve.

Taking up first Figs. 1 and 2, *a* is the regulating-cover of a liquid-separator, which by means of a pipe *b* communicates with a receptacle *c* for the liquid to be separated. In this receptacle, as shown, or, of course, in the regulating-cover, as the case may be, if the receptacle *c* is omitted a float *d* is arranged, which by means of a rod *e* is connected with a valve of a suitable type. On the drawings I have shown a valve, the cock *f* of which is turnable into the box *g*. The cock *f* is provided with a projecting lever *h*, and with this lever *h* the rod *e* is connected. The cock *f* of this valve is provided with a hole *i*. When the valve is operated by the float *d* by means of the rod *e*, so as to take the position shown in dotted lines in Figs. 1 and 3, which will occur when the supply-can or the regulating-cover is empty and the float rests on the bottom of the receptacle *c*, the valve will not be quite shut off, but a small quantity of steam can pass through the hole *i*, so that the separator may maintain its speed, though it is now running empty. As soon as the supply-can or the regulating-cover is refilled the float rises and then the cock *f* will be turned, so that the full steam-supply is admitted. It is obvious that instead of the hole *i* other appliances may be used with the same result—i. e., the partial supply of steam. For

instance, the hole *i* may be omitted and the cock *f* by means of a clutch be prevented from entirely shutting off the supply of the steam.

5 In the modified form shown in Figs. 3 and 4 the gravity of the milk in the supply-can or in the regulating-cover is used for the operation of the valve. The receptacle *a* of the regulating-cover in this case is suspended on
10 the one end of a balance *k*, the other end of which is connected with the rod *l*. On said rod a counterweight *m* is arranged, the gravity of which corresponds to that of the receptacle *a* when filled. The rod *l* is connected
15 with a valve of any convenient type, as a turning-valve of the shape shown in Figs. 1 and 2. As soon as the level of the milk in the receptacle *a* sinks, whereby also the gravity of the receptacle *a* decreases, the weight *m*
20 will sink, and the valve-cock *f* is operated to shut off the steam-supply more or less. As before, when the receptacle *a* is empty and the weight *m* has sunk to its lowest point, the valve is not entirely shut off, but permits,
25 through passage *i*, a sufficient quantity of steam to pass as is required for the separator to run empty.

In Fig. 5 I have shown a rotary valve *n* for controlling the admission of the steam, hav-
30 ing an orifice *o* through it, which when the valve is turned to closed position registers with the steam-inlet and allows sufficient steam to pass to the inlet to keep the empty bowl at constant speed. This valve may be
35 connected to either the arrangement of Figs. 1 and 2 or Figs. 3 and 4.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

40 1. In a centrifugal separator, driven by a turbine, the combination with a regulating-valve for the control of the motive fluid to the turbine, of connections therewith operated by the amount of the liquid to be treated
45 in the separator adapted to admit a predetermined amount of motive fluid when the liquid is exhausted and increase the amount proportionately to the amount of liquid to be treated.

50 2. In a centrifugal separator driven by a turbine, in combination with a regulating-valve for the control of the motive fluid, of connections therewith operated by the amount of the liquid to be treated in the separator, and means to provide a flow of the
55 motive fluid when the valve is closed.

3. In a centrifugal separator driven by a turbine, the combination with a receptacle containing the liquid to be treated, a valve
60 for controlling the admission of the motive fluid to the turbine, of connections between said liquid and said valve whereby the amount of liquid in said receptacle controls the position of said valve, and means to pro-

vide a flow of the motive fluid to the turbine 65 when the valve is closed.

4. In a centrifugal separator driven by a turbine, in combination a receptacle for the liquid to be treated, a float in said liquid, a movable valve regulating the admission of
70 the motive fluid to the turbine, a rod connecting said float and valve, and an opening for the admission of motive fluid to the turbine when the valve is closed.

5. In a centrifugal separator driven by a turbine, in combination a receptacle for the liquid to be treated, a pivoted support for the receptacle, a weighted rod connected to said support on the opposite side of the pivot to
75 that of the receptacle, a valve for controlling the admission of motive fluid to the turbine, connections between said weighted rod and said valve, and an opening for the admission of motive fluid in the turbine when the valve
80 is closed. 85

6. A valve for regulating the admission of motive fluid to a turbine for driving a centrifugal separator, comprising a rotary valve having an orifice therethrough in such position as to admit the motive fluid therethrough
90 when the valve is closed.

7. In a centrifugal separator, driven by a turbine, in combination a regulating-valve to control the motive fluid to the turbine, a reservoir for the liquid to be treated in the separator, means to admit a predetermined
95 amount of motive fluid to the turbine when the liquid-reservoir is without liquid, and means to increase the amount of motive fluid admitted to the turbine proportionately to the amount of liquid in the reservoir. 100

8. In combination, a valve for regulating the admission of motive fluid, a reservoir adapted to contain liquid, connection between said reservoir and the valve whereby the
105 amount of liquid in the reservoir controls the position of the valve, and means to admit motive fluid when the valve is closed.

9. In combination, a valve for regulating the admission of motive fluid, a reservoir adapted to contain liquid, connection between said reservoir and the valve, whereby the amount of liquid in the reservoir controls the position of the valve proportionately to the amount of liquid in the reservoir, and
110 means to admit motive fluid when the valve is closed. 115

10. In combination, a valve for regulating the admission of motive fluid, a reservoir adapted to contain liquid, connection between said reservoir and the valve, whereby the amount of liquid in the reservoir controls the position of the valve, and means to admit a predetermined amount of motive fluid
120 when the valve is closed.

11. In combination, a valve for regulating the admission of motive fluid, a reservoir adapted to contain liquid, connection be-
125

tween said reservoir and the valve, whereby the amount of liquid in the reservoir controls the position of the valve proportionately to the amount of liquid in the reservoir, and
5 means to admit a predetermined amount of motive fluid when the valve is closed.

In testimony whereof I have signed my

name to this specification in the presence of two subscribing witnesses.

WALTER JÖRGENSEN.

Witnesses:

CARL FRIBERG,

GUST. ALSON.