

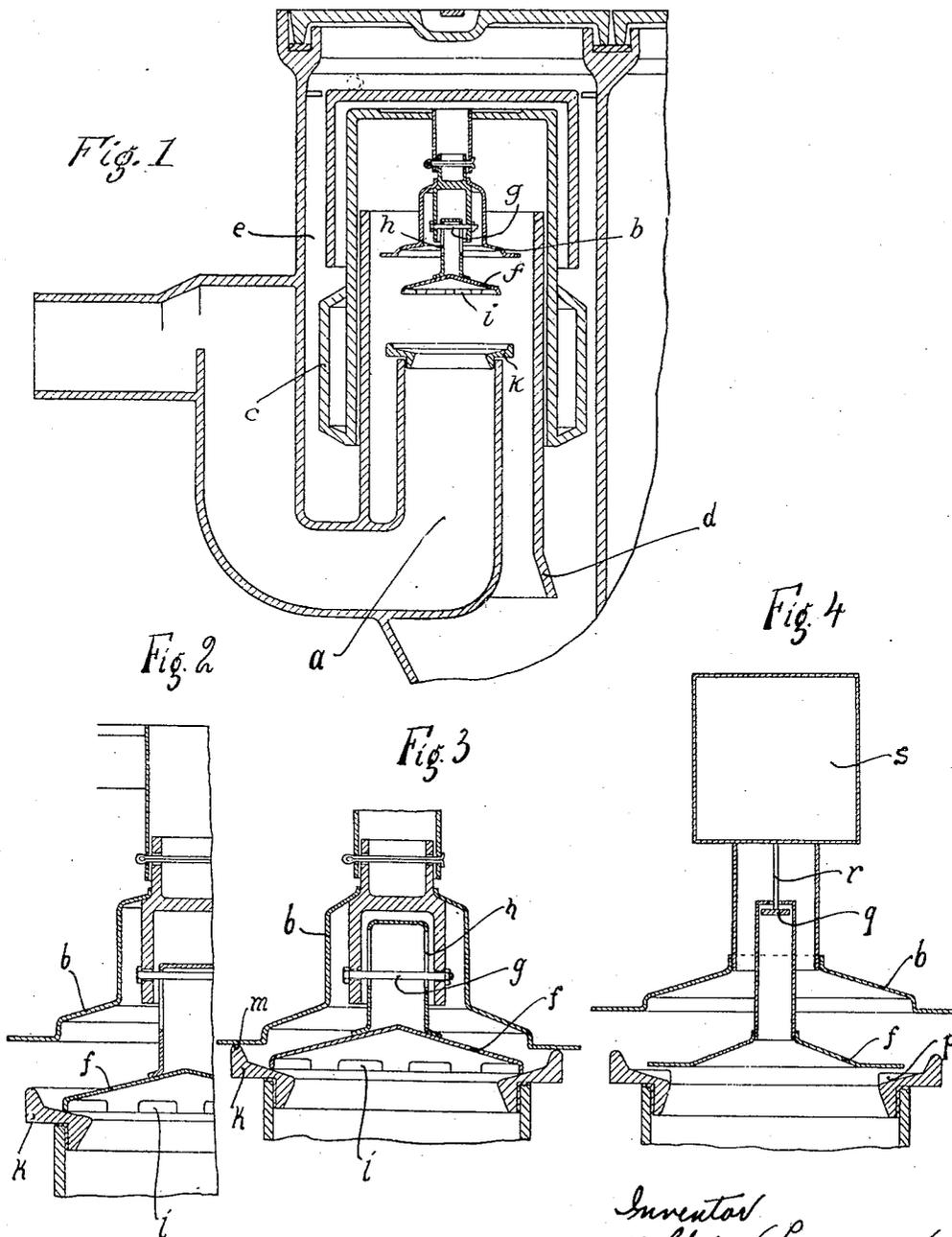
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## UNITED STATES PATENT OFFICE

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In automatically operating float-controlled separators for light liquids ordinarily a suction effect is being exerted on the float in case large quantities of water pass through the separator. This suction effect which in general will cause intermittent motion of the float may at times assume such an intensity that the float will be pressed upon the aperture which serves for the passage of the liquid through the separator with the result of premature closing of the latter and in consequence thereof flooding of the bottom with water.

According to my invention I provide a special or additional closing member which is adapted to reduce the effective cross-section or width of passage of the separator, said special or additional closing member being operatively connected with the main closing member or float to permit, to a certain extent, displacement of the former member with respect to the latter. The additional closing member will thus still remain in closing condition subsequent to lifting the main closing member from its seat and move not before said main closing member has been lifted to an extent that all danger of the aforementioned suction effect will be avoided. The additional closing member which according to my invention serves for reducing the width of passage of the separator may be arranged and constructed in various ways. Preferably, for the purpose of my invention the additional closing member is constructed in the form of a plate positioned underneath the main closing member proper of the separator, said additional closing member or plate resting in closed condition of the separator on ribs provided for this purpose upon the discharge pipe. However, said additional closing member or plate may also consist of a perforated plate or solely of a body which is immersed into the orifice of the discharge pipe. The construction of my new separator is connected with the advantage that in the first place the aforementioned suction effect will be successfully prevented, and that in the second place a sign of warning will be given to the owner of the plant, this sign of warning consisting in the

fact that the stored up water flows over as soon as the quantity of liquid passing through the plant becomes excessive as compared with the size of the separator, or in case the separator is in a condition requiring cleaning. In spite of this, however, there will be a discharge of the water flowing over as the additional closing member which is mounted displaceably on the float solely reduces the effective width of passage of the discharge pipe. Further advantages of my present construction consist therein that after complete lifting of the main closing member the full width of passage of the discharge pipe required for a free discharge of water will be cleared and that, in particular, cleaning of the discharge pipe will in no way be rendered difficult on account of the presence of a safety device, the discharge pipe being freely exposed after taking the float out of the separator.

In the accompanying drawing which forms part of this specification I have represented an example of a separator constructed according to my invention. In the drawing Fig. 1 is a longitudinal section through my new separator for light liquids in fully lifted condition of the main and additional closing member, Fig. 2 a detail view, partly in cross-section, showing the aforementioned closing members in position midway between closing and opening, Fig. 3 a similar detail view showing the closing members in closed condition, and Fig. 4 a further detail view of a modified form of the additional closing member.

Referring now more particularly to the drawing, the upwardly directed end of the discharge pipe *a* may be closed up by a main closing member or plate *b* which is connected with a float *c* positioned outside of the immersion pipe *d* within the space *e* in which benzole may collect on top of the waste-water. From the main closing member *b* there is suspended a second or additional closing member *f* by means of a bolt *g* passing through slots *h* in said additional closing member *f*. Upon downward motion of the float, at first the plate *f* or additional closing member which is provided at its rim with apertures or passages *i* will be placed upon

the ring-shaped seat *k* of the discharge pipe *a*, while the main closing member *b* will still be positioned at some height above said discharge pipe. This position of the main and the additional closing member is shown in Fig. 2. Only upon further downward motion of the float, the main closing member or plate *b* will come in contact with the ring-shaped seat *k* as shown in Fig. 3 to close the passage through the separator. Thus, during lifting of the main closing member *b* at first the additional closing member or plate *f* remains in position on the seat *k* and discharge of liquid from the separator can take place solely through the slots *i* in said plate. In this manner any suction effect will be prevented from being exerted on the main closing member *b* as long as it is positioned in proximity to the discharge orifice. Upon continued lifting motion of the float which will cause the main closing member *b* to be lifted out of zone of danger, the additional closing member or plate *f* will now likewise be moved, thus clearing the entire cross-section of the discharge pipe *a*.

According to Fig. 4 which shows a modified construction of my new separator, the additional closing member or plate *f* is of closed conformation at its periphery. During downward motion the plate *f* will come in contact with the projections *p* which are provided on the ring-shaped seat *k* at certain distances from each other to permit discharge of water through the passages provided intermediate said projections. The projections *p* are properly spaced and positioned at a height permitting to obtain between said projections a free clear cross-section in contacting condition of the plate and the projections which is smaller than the clear width of passage of the discharge pipe *a*. The plate *f* is mounted displaceably on a rod *r* provided with a stop *q*, said rod being fastened to the float *s*.

I claim:

1. In a separator for liquids of different specific gravity, the combination with a float movable over an outlet passage of the separator, of a main closure member depending from the float for covering the mouth of the passage, and an auxiliary closure member movable within the main closure member for reducing the cross section of the passage to reduce the suction on the main member when the liquid passes through the passage, said auxiliary closure member being mounted within the main member to permit perpendicular movement within said member.

2. In a separator according to claim 1, the improvement having a main closing member of the form of a plate, and an additional closing member likewise of the form of a plate arranged underneath said main closing member or plate, said additional closing member or plate being suspended displaceably with

respect to said main closing member or plate, and lateral apertures provided on said additional closing member or plate permitting passage of liquid in closed condition of said additional closing member or plate.

3. In a separator according to claim 1, the improvement comprising a main closing member of the form of a plate, and an additional closing member likewise of the form of a plate arranged underneath said main closing member or plate, said additional closing member or plate being suspended displaceably underneath said main closing member or plate by means of a bolt, and guide slots for said bolt provided on said additional closing member or plate.

4. In a separator according to claim 1, the improvement comprising a main closing member of the form of a plate, and an additional closing member likewise of the form of a plate arranged underneath said main closing member or plate and suspended by means of a bolt and guide slots displaceably with respect to said main closing member or plate.

5. In a separator according to claim 1, the improvement comprising a main closing member of the form of a plate and an additional closing member of the form of a plate with a closed rim, a ring shaped seat for said additional closing member, and spaced projections on said seat permitting passage of liquid in closed condition of the separator through the interstices intermediate said projections.

6. In a separator claim 1, the improvement comprising an additional closing member in the form of a plate, and suspension means for mounting said additional closing member or plate in suspended condition on the main closing member, said suspension means including a rod and a stop thereon permitting relative motion between said main and said additional closing member.

7. In a separator for liquids of different specific gravity, the improvement comprising an immersion pipe, an outlet passage pipe in said first pipe, a float surrounding said immersion pipe and a main closure member suspended from the float having a flattened out rim portion for covering the peripheral portion of the outlet passage pipe and an auxiliary closure member movably insertable into the main closure member and having a bottom portion corresponding with the inner diameter of the outlet passage pipe, said auxiliary closure member being movable vertically within the main member whereby the auxiliary member will remain in closed position with the outlet pipe until the main closure member has been sufficiently raised to overcome any suction effect of escaping liquid into the outlet pipe.

8. In a separator for liquids of different specific gravity, the combination with a float

movable over an outlet passage of the separator of means depending from said float for closing said outlet, said means including a first closure member movable to limit the flow of liquid through said outlet passage and a second closure member carried by the float and movable with respect to said first closure member serving to cut off the flow of liquid through said outlet passage altogether.

9. In a separator for liquids of different specific gravity having a chamber and an outlet for said chamber, a float within said chamber, means carried by said float for partially closing said outlet when said float sinks to a predetermined level and additional means carried by the float and movable with respect to said first mentioned means for cutting off the flow of liquid through the outlet altogether when said float sinks to a lower level.

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