

(No Model.)

P. GAILLET.
DECANTATION APPARATUS FOR EFFECTING THE AUTOMATIC SEPARATION
OF SOLID MATTERS HELD IN SUSPENSION IN LIQUIDS.

No. 372,216.

Patented Oct. 25, 1887.

FIG. 1.

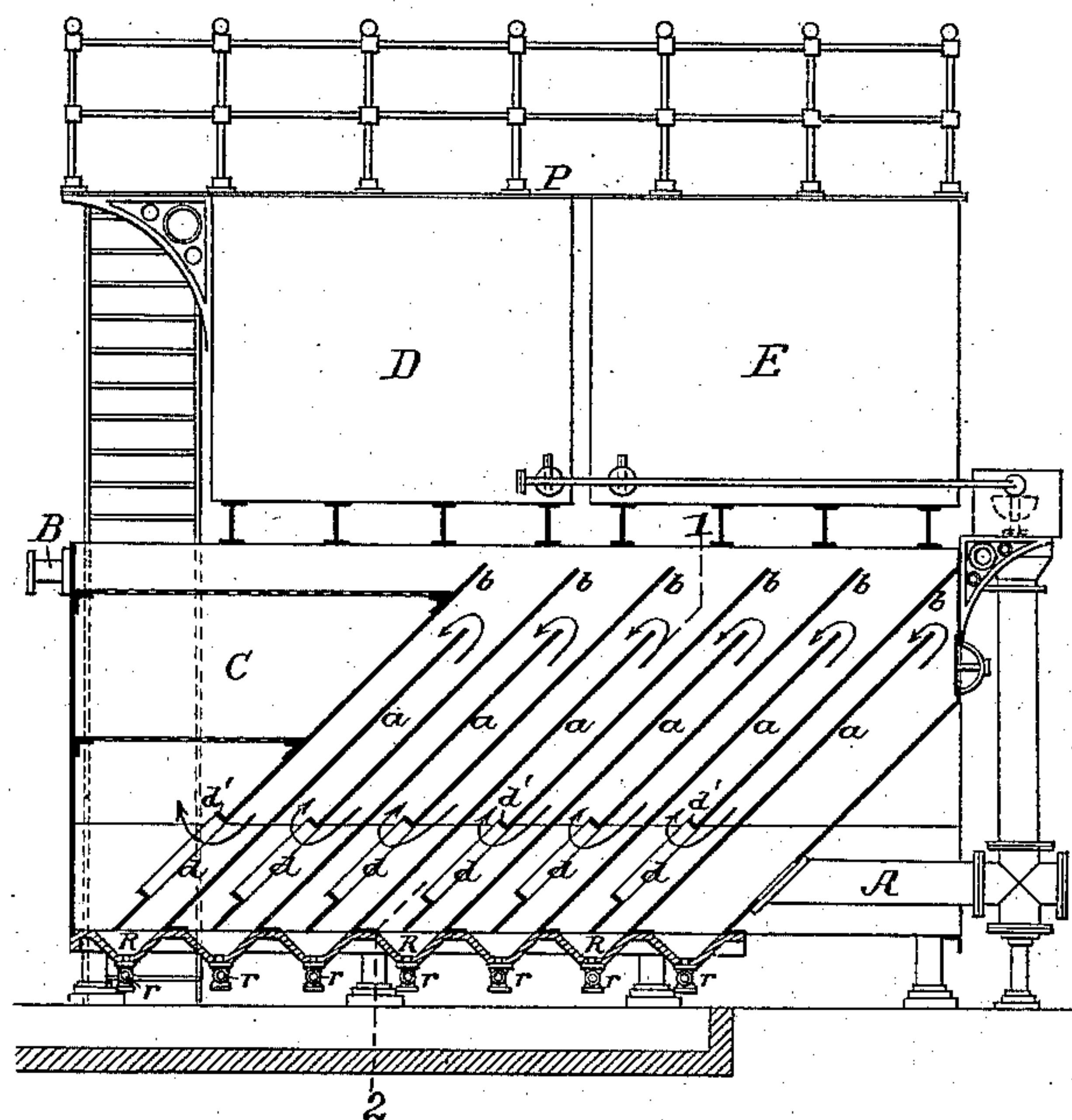


FIG. 2.

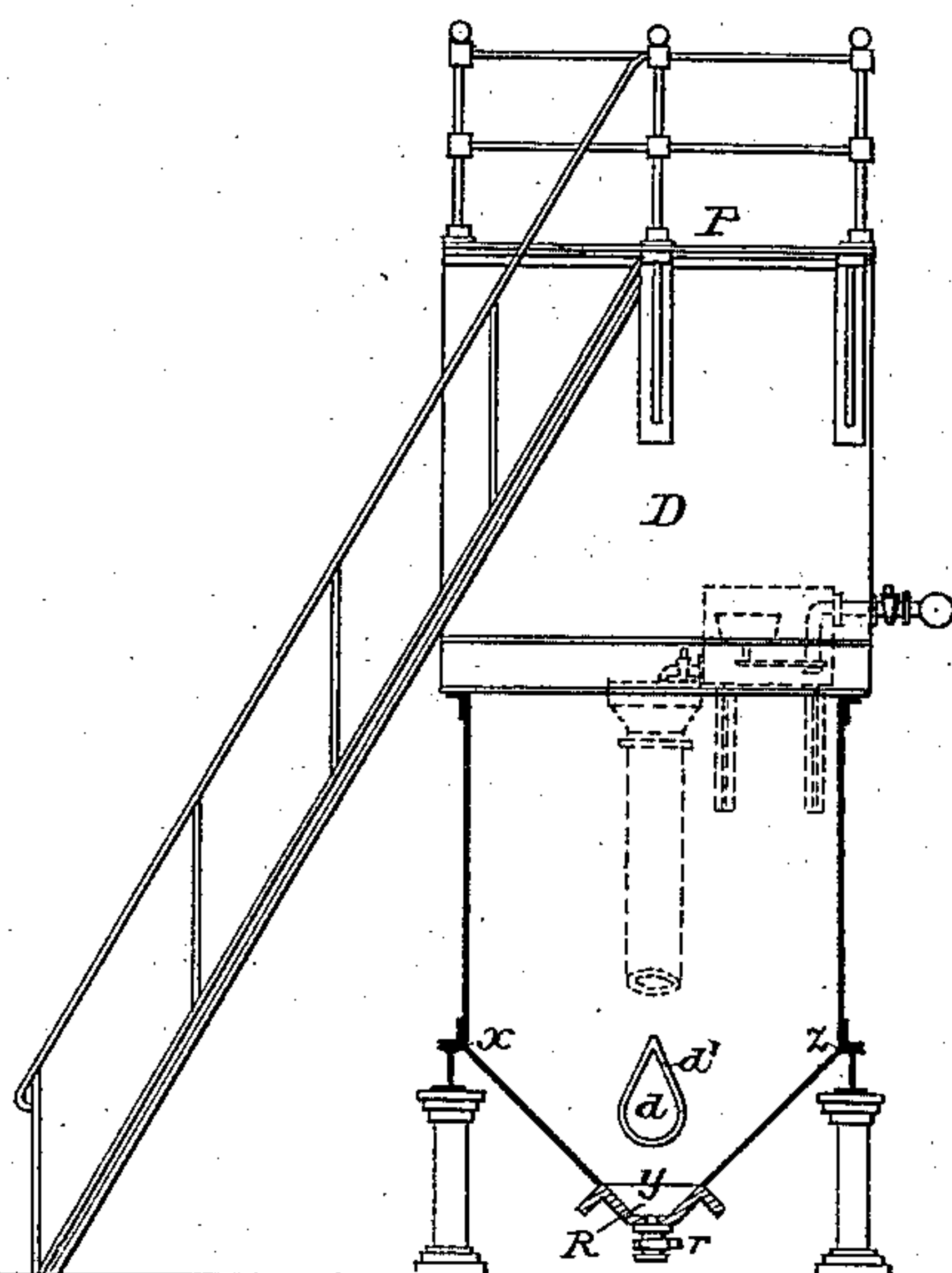


FIG. 3.

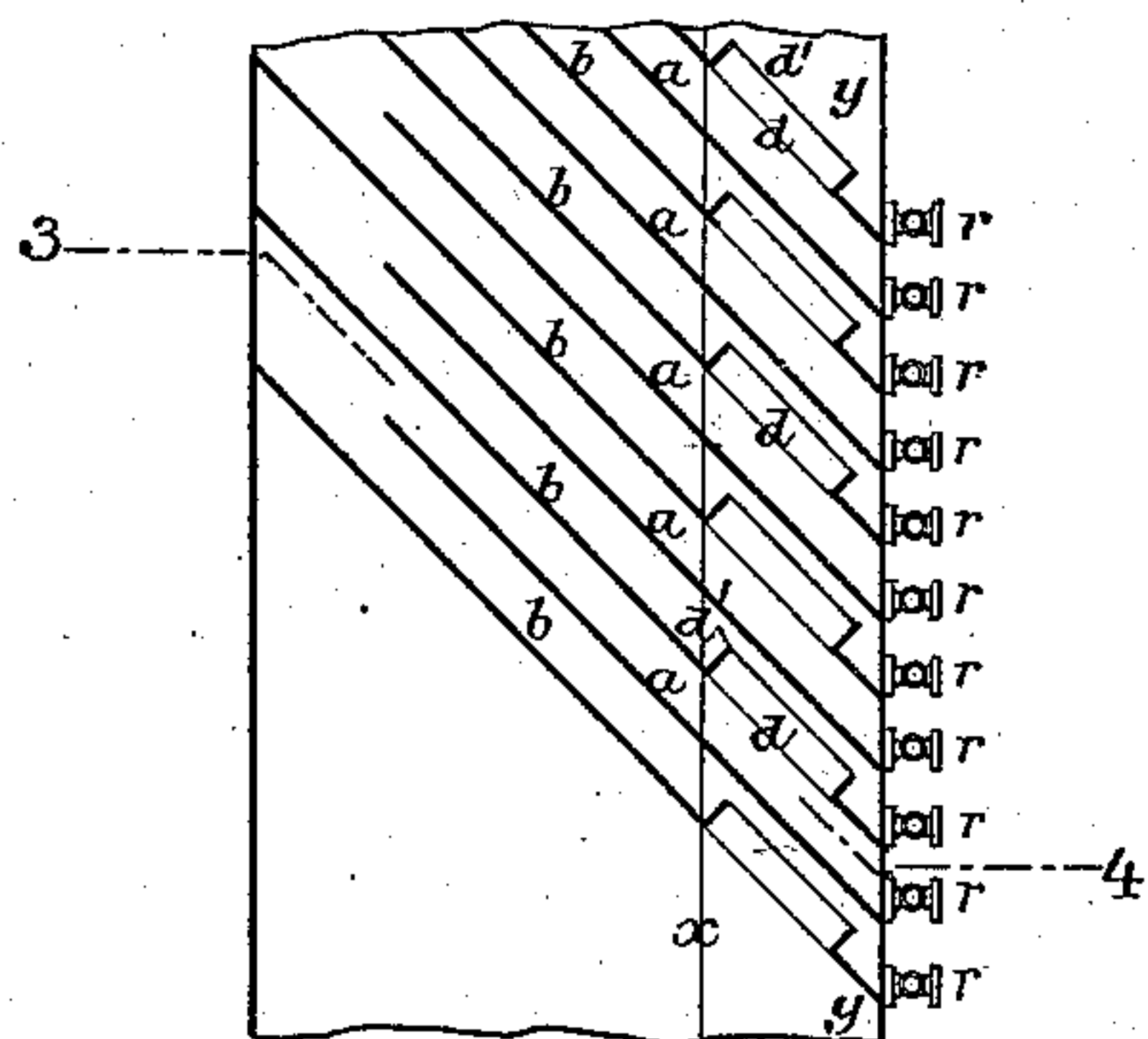


FIG. 5.

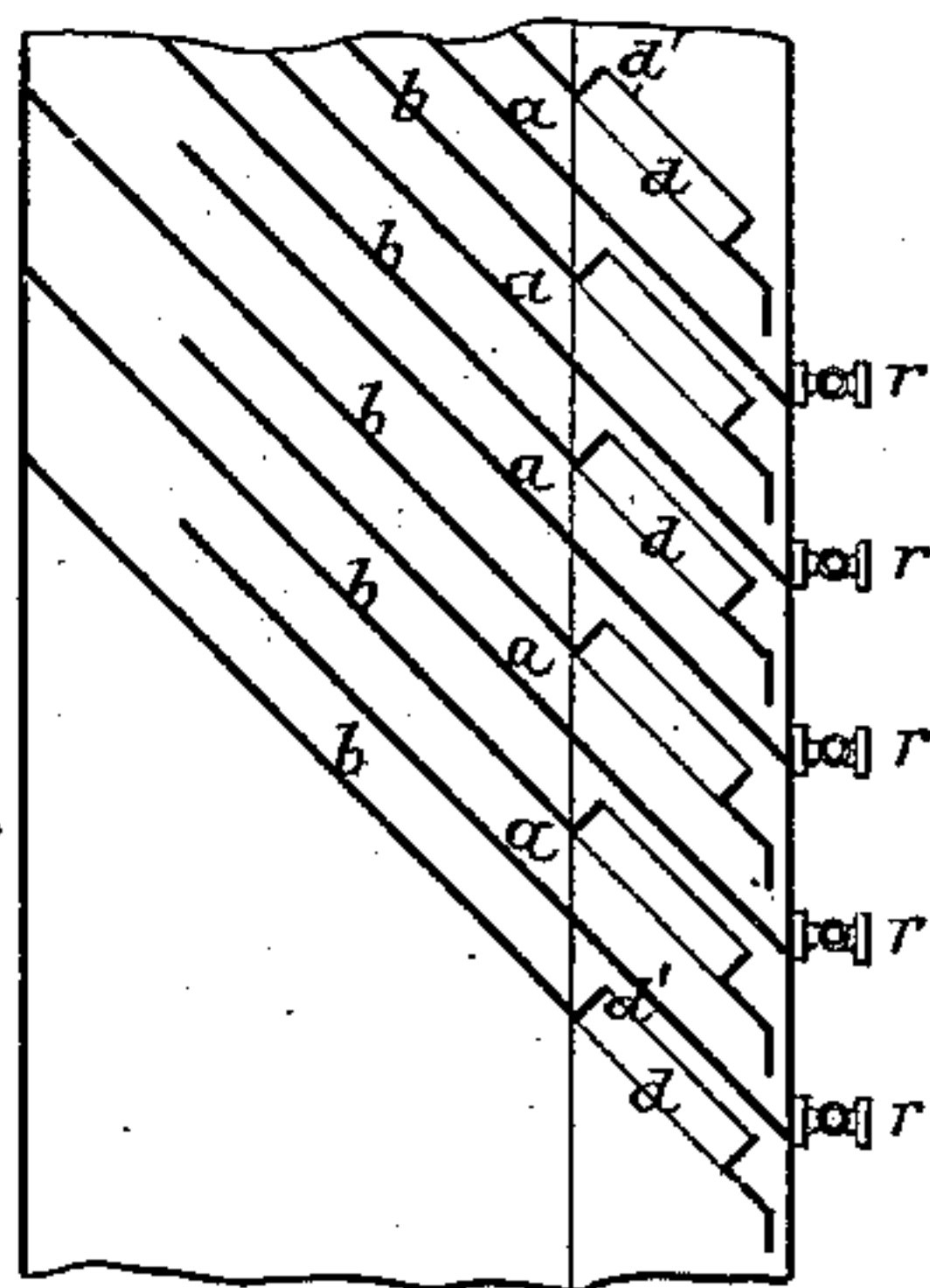
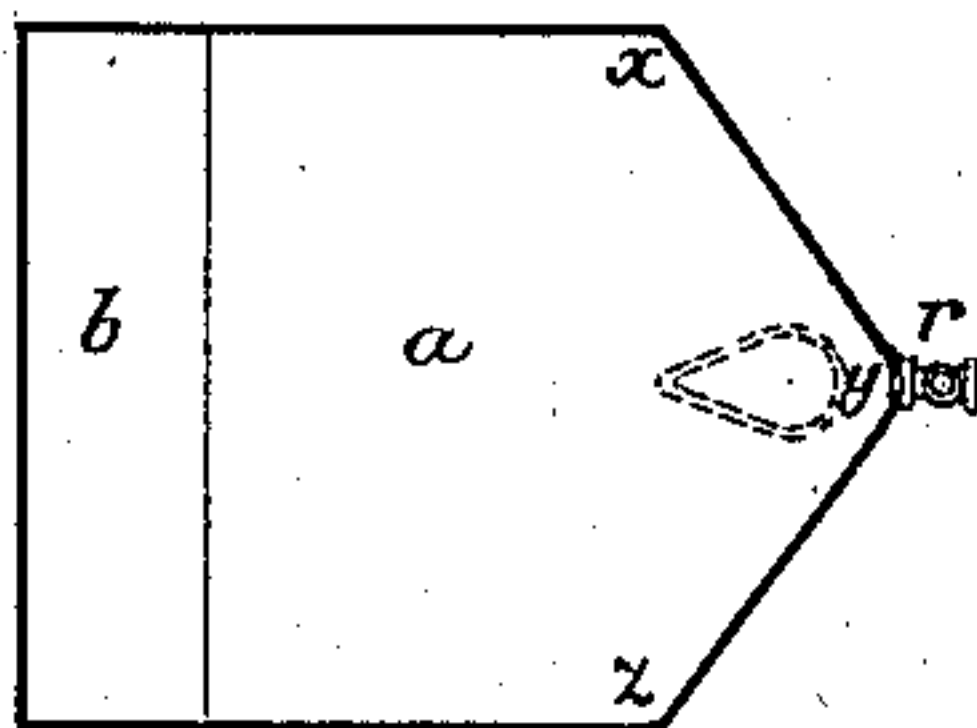


FIG. 4.



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DECANTATION APPARATUS FOR EFFECTING THE AUTOMATIC SEPARATION OF SOLID MATTERS HELD IN SUSPENSION IN LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 372,216, dated October 25, 1887.

Application filed March 15, 1887. Serial No. 231,063. (No model.) Patented in France October 24, 1882, No. 151,693; in Italy August 30, 1884, No. 17,220, and March 8, 1886, No. 19,604; in Belgium March 17, 1886, No. 72,393; in Germany May 28, 1886, No. 33,032, and in Spain July 22, 1886.

To all whom it may concern:

Be it known that I, PAUL GAILLET, a citizen of the Republic of France, and a resident of Lille, Nord, France, have invented certain Improvements in Decantation Apparatus, (for which I have obtained certificate of addition dated September 5, 1885, to French Patent No. 151,693, dated October 24, 1882; Belgian Patent No. 72,393, dated March 17, 1886; German Patent No. 38,032, dated May 28, 1886; certificate of addition dated March 8, 1886, No. 19,604, to Italian Patent No. 17,220, dated August 30, 1884, and certificate of addition dated July 22, 1886, to Spanish patent,) of which the following is a specification.

The improvements forming the object of the present invention relate to decantation apparatus for effecting the separation of solid matters held in suspension in liquids.

The said improvements consist in the novel form and arrangement of the partitions or diaphragms forming, in any suitable casing, compartments which the liquid to be clarified is caused to traverse, ascending and descending alternately, leaving in each compartment a portion of the solid particles which it holds in suspension. The diaphragms are made perfectly flat, which facilitates the construction and insures great regularity in the decantation, and they form, with the sides of the horizontal or vertical case containing them, inclined compartments terminating in triangular troughs, into which all the deposits formed on the flat surface of each of the diaphragms converge or gather.

In the accompanying drawings, Figure 1 represents a longitudinal section of an apparatus for decantation constructed in accordance with my invention. Fig. 2 is a corresponding transverse section of the same, taken along the line 1 2, Fig. 1. Fig. 3 is a vertical section of a modification. Fig. 4 is a sectional plan view of the same on the line 3 4, Fig. 3; and Fig. 5 is a part vertical section of a modification.

The apparatus consists, mainly, of a horizontal case, F, in which partitions or diaphragms *a a* and *b b*, inclined at an angle of

about forty-five degrees, are arranged baffle-wise.

The liquid to be clarified enters the lower part of the decantation apparatus through a pipe, A, under a suitable head or pressure, being compelled to follow the course traced out for it by the diaphragms, following alternately upward and downward, leaving behind the solid particles which it carried, and which, by reason of their greater density, are deposited on these diaphragms. The discharge of the clarified liquid takes place at the upper part of the decantation apparatus through the pipe B. If required, this outlet may be preceded by a safety-filter, C, (not needed in the generality of cases,) serving to intercept any solid particles which may have escaped the decanting action or which may have been carried through the apparatus mechanically, owing to unforeseen circumstances. This filter may be composed of any suitable filtering materials held between perforated diaphragms. This being premised, I will now proceed to describe the more essential features of my invention.

The metal case, in place of being a complete rectangle in section, is made of a form which, in section, presents at the lower end a triangular or V-shaped part, *x y z*, so arranged that the inclination or angle of the surfaces of the sides *x y* and *z y* is the same as that of the diaphragms *a a b b*. Thus, if the diaphragms be inclined at an angle of forty-five degrees, the sides *x y* and *z y* are likewise inclined at an angle of forty-five degrees—that is to say, the angle at *y* is an angle of ninety degrees. The deposits formed on the diaphragms slide down the flat surfaces of the latter, and on arriving at the lines of intersection where the diaphragms meet the sides *x y* and *z y* they commence to be gathered together or converge, and are finally arrested in the lower angle at *y*. The right angle at *y* of the triangle *x y z* is cut off or truncated and provided with a collector in the form of a basin, R, common to two compartments and terminated by a discharge-cock, *r*.

It will be observed that the intermediate diaphragms *b b* are extended as far as the basin

for collecting the deposits in order that the deposits found thereon may pass directly into this basin. The liquid circulates at the lower part of these diaphragms through openings *d*, situated 5 above these basins. This opening is made in the lower part of said diaphragm *b*, and is provided with a raised edge or flange, *d'*, for turning aside the deposits sliding down the diaphragm, the flange being of such shape as not 10 to impede the descent of the deposits. The shape of the flange or opening may be modified; but it must retain the angular shape at the upper part, as illustrated in Fig. 2, so as to turn aside the deposits. By these means the 15 deposits are caused to descend regularly over the entire surface of the diaphragms and are never taken up again by the flow of liquid undergoing decantation or clarification rising in the opposite direction, likewise over the 20 entire surface. The efficiency of the apparatus is thus insured.

The horizontal arrangement of the apparatus, as illustrated in the drawings, enables the whole of the upper part to be opened or 25 exposed, and thus permits the progress of the decantation to be watched. This arrangement also affords access to all internal parts of the apparatus, so that they can be painted, for example, when necessary.

30 It is true that the apparatus thus arranged takes up more room; but this will be sometimes compensated for by the facility afforded for placing reservoirs or reaction-tanks directly over the apparatus, as indicated at D and E in the drawings. The platform P, arranged above these tanks, affords ample room 35 for the workmen. The arrangement of the tanks and platform may evidently be modified in any suitable way, according to the object in view and the space at disposal.

The construction hereinbefore described in connection with a horizontal apparatus is also applicable to vertical apparatus, with the exception that in the vertical apparatus the arrangement for the collection and discharge of 45 the deposits is modified, as follows:

According to one modification (illustrated in Figs. 3 and 4) the diaphragms abut against the V-shaped or triangular part *y*, Fig. 3, of the 50 casing, and cocks *r*, for discharging the deposits, are provided for each diaphragm, the passage for the liquid through alternate diaphragms being through openings *d*, as described in connection with the horizontal apparatus. In another modification (illustrated

in Fig. 5) the intermediate diaphragms, *b b*, in place of extending to the discharge-cocks, are bent at their angular extremities, as indicated in Fig. 5, in such a manner as to cause the deposits to fall onto the diaphragm next beneath, 60 so that one cock suffices for two diaphragms. In these two constructions the V-shaped or triangular part *y* of the casing is likewise truncated, in order to provide a flat surface for attaching the cocks. 65

The decanting apparatus thus constructed, and of any dimensions, being arranged vertically or horizontally, and with any desired number of compartments, is applicable to the clarification of all descriptions of liquids— 70 such as oils, varnishes, or saccharine or salt liquids, &c. It is also applicable to the separation of insoluble chemical substances, and in particular to the clarification of water chemically purified. 75

I claim as my invention—

1. The casing having a V-shaped part, *x y z*, in combination with plain inclined diaphragms *a b*, correspondingly shaped and forming compartments communicating with each 80 other at opposite ends alternately, and discharge-cocks for the V-pockets, all substantially as described.

2. The combination of the inclined diaphragms of a decantation apparatus with the 85 casing having a V-shaped part, *x y z*, collecting-basins, each common to two compartments formed by the diaphragms and at the angle of the V shape, and discharge cocks therefor, substantially as described. 90

3. The combination of the casing of a decantation apparatus, having a V-shaped part, with corresponding inclined diaphragms adapted thereto and extended into the angle of the V shape, the alternate diaphragms hav- 95 ing openings *d*, as and for the purpose described.

4. The combination of the casing of a decantation apparatus, having a V-shaped side 100 in section, with corresponding inclined diaphragms, of which the alternate ones have openings *d*, with flanged edges, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two sub- 105 scribing witnesses.

PAUL GAILLET.

Witnesses:

JOSEPH MICHAL,
LOUIS DELBEY.