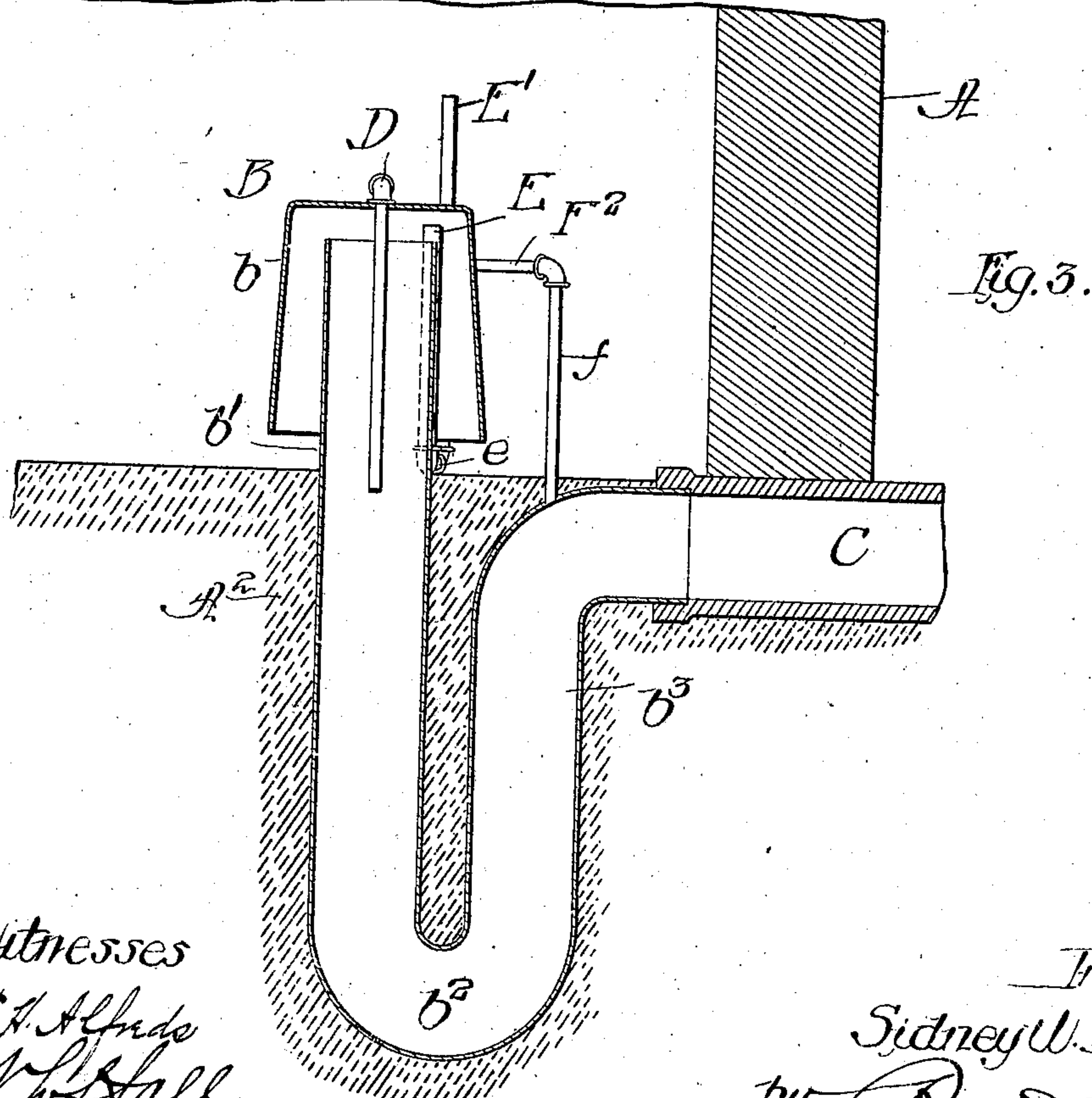
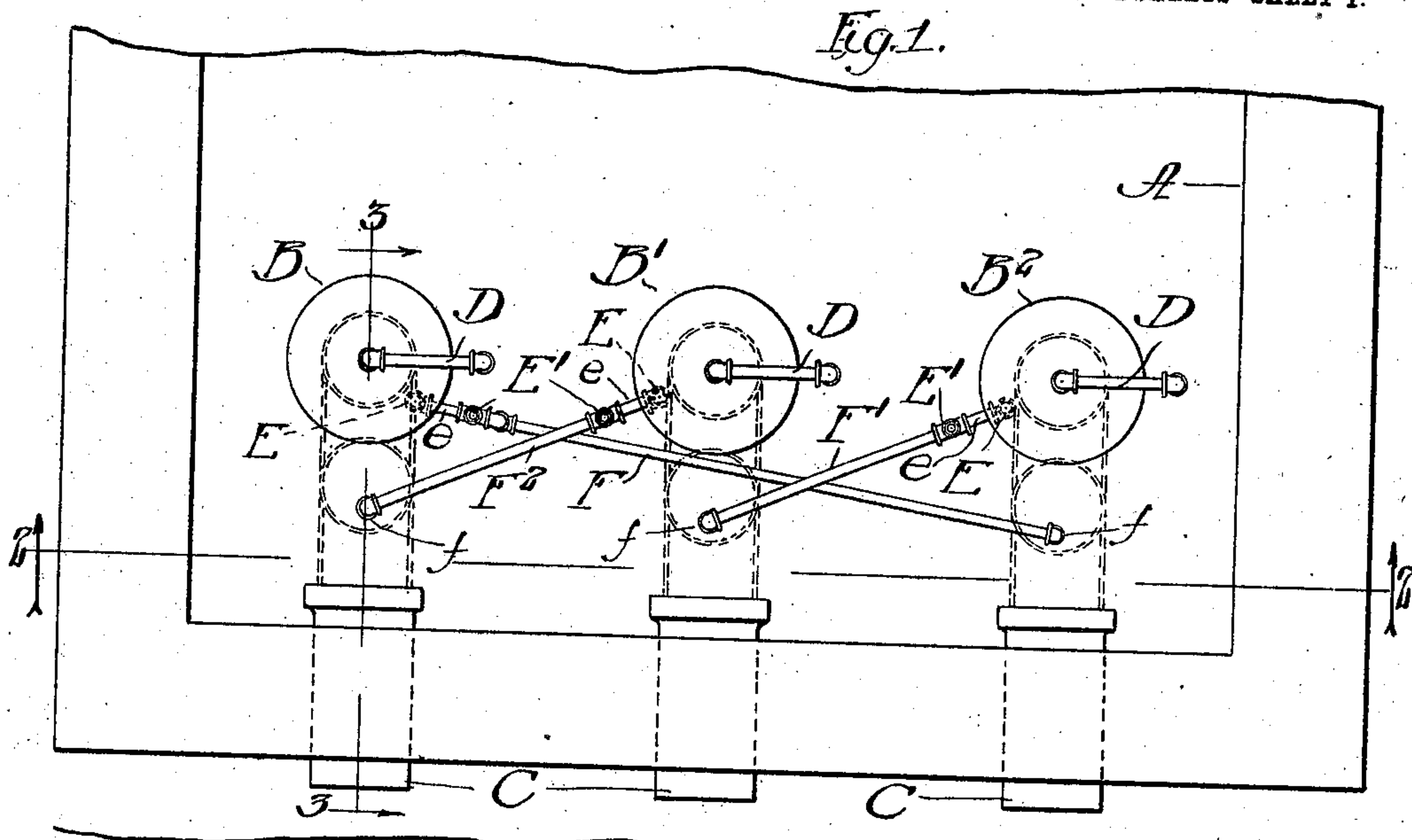


No. 847,592.

PATENTED MAR. 19, 1907.

S. W. MILLER.  
TRIPLE ALTERNATING SIPHON.  
APPLICATION FILED OCT. 25, 1906.

2 SHEETS—SHEET 1.



Witnesses  
J. H. Alford  
W. H. Hall.

Inventor  
Sidney W. Miller  
by Paul Brown  
his Atty



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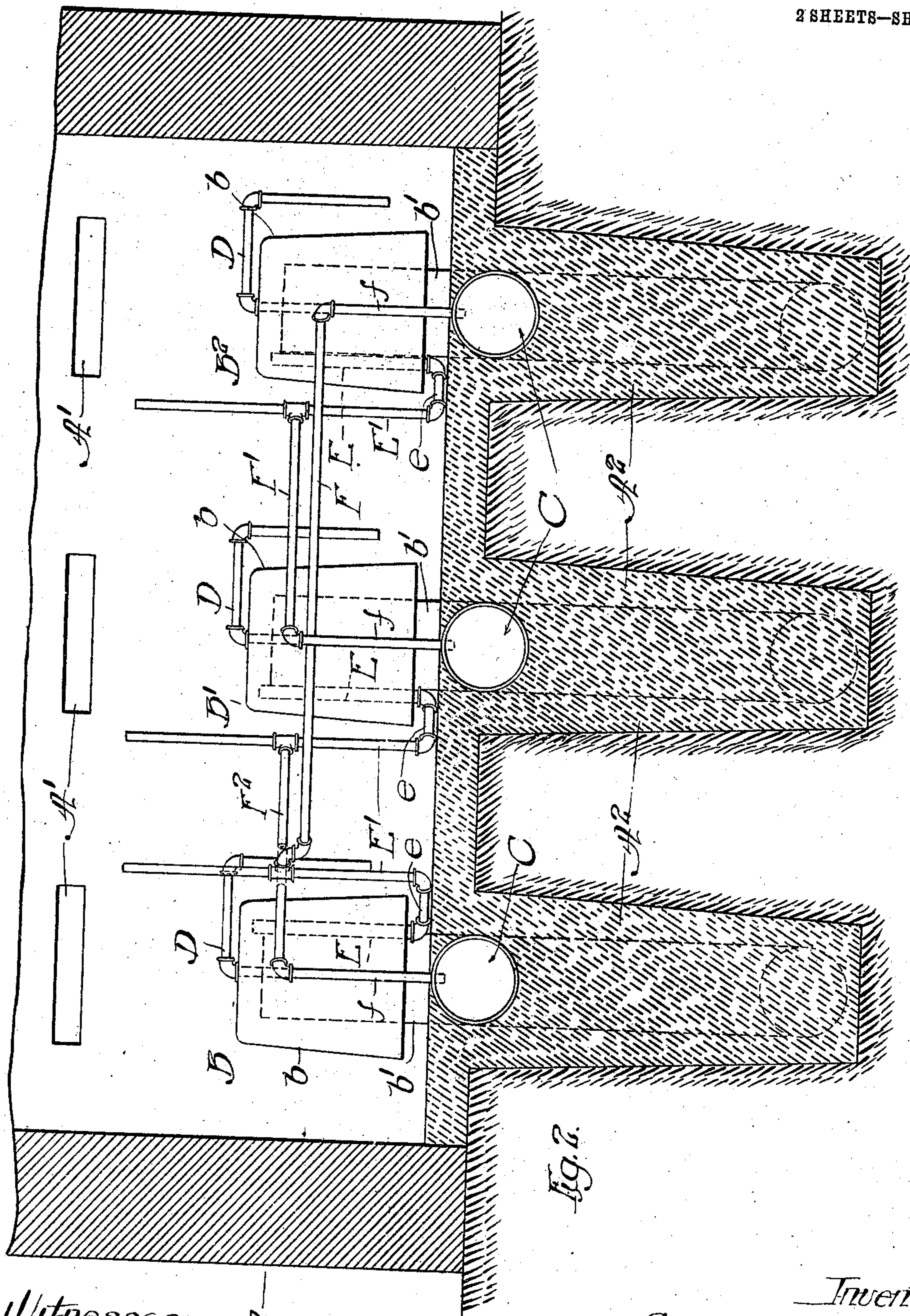


Fig. 2.

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J. H. Alfreds  
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# UNITED STATES PATENT OFFICE.

SIDNEY W. MILLER, OF CHICAGO, ILLINOIS.

## TRIPLE ALTERNATING SIPHON.

No. 847,592.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed October 25, 1906. Serial No. 340,576.

*To all whom it may concern:*

Be it known that I, SIDNEY W. MILLER, a citizen of the United States, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Alternating Siphons, (Case B;) and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in apparatus designed for controlling the flow of liquid from a main tank to a plurality of tanks or receptacles and so arranged that the plurality of receptacles may be filled or charged in a predetermined rotative order from said main or central tank.

My improved controlling apparatus may be used wherever it is desired to distribute liquid from a central tank in a predetermined or rotative order to a plurality of tanks or receptacles or other places for the disposal of the liquid.

The invention is especially applicable for use in connection with that type of sewage-purifying systems wherein the sewage is subjected to preliminary septic treatment.

My improved apparatus in this use thereof is designed to be located between the septic-tank and the contact or filter beds to receive the sewage from the septic-tank and properly distribute it upon said beds.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

As shown in the drawings, Figure 1 is a partial plan view of a distributing or dosing tank, showing in plan view the siphonic equipment for emptying same. Fig. 2 is an enlarged vertical section thereof with parts shown in section. Fig. 3 is an enlarged vertical section of one of the siphons and its equipment, taken in a plane at right angles to the plane of Fig. 2.

As shown in the drawings, A designates a tank, which may be termed a main "distributing" or "dosing" tank and which is adapted for connection with a source supplying liquid through conduits A'. The tank when filled is designed to be emptied into a plurality of separate receptacles (not herein shown) through the medium of a plurality of deep-seal siphons B B' B<sup>2</sup>, which, as herein shown, are disposed in a straight line near

one wall thereof. The said siphons for emptying the tank are of that type which are brought into operation through the medium of a blow-off trap having a seal of less depth than the seal of the trap, outwardly through which the liquid flows from an operating-siphon. The short leg *b* of each siphon consists of a downwardly-opening bell, which is supported over the upper end of the lower leg *b'* of the siphon in any suitable or familiar manner. Said longer leg of each siphon communicates with a deep-seal trap *b<sup>2</sup>*, having an upturned or outlet leg *b<sup>3</sup>*, that discharges the liquid contents of the tank flowing through the siphon and its trap into a pipe or conduit C, leading to a suitable place for the disposal of liquid.

The deep-trap seal of each siphon is filled by the liquid flowing therein during the emptying operation of said siphon. Each of said siphons is provided with a blow-off trap having a seal of less depth than that of the main trap of the siphon, and each siphon is brought into operation by pressure, which forces the seal of the blow-off trap. Said blow-off trap of each siphon comprises an inner or receiving leg E, rising into and opening upwardly in the bell or shorter leg of the siphon a distance above the receiving end of the longer leg of the siphon, and an outer or discharge-leg E', connected with the inner leg by a short transverse member *e* and opening at its upper end into the atmosphere at a point above the maximum liquid-level in the tank. The said siphons, thus equipped, are arranged in the tank and connected in a manner generally similar to that shown in the prior United States patent to Adams, No. 760,770, wherein the siphons are connected in such manner that they operate to alternately empty the tank in a predetermined rotative order. In the present construction the blow-off traps of the several siphons are each connected by a pipe with the main trap of another siphon of the series in such manner that during the operation of each siphon liquid is diverted to the main or deep-seal trap of an idle siphon, thereby filling or partially filling the trap of the latter siphon.

The operating-siphon fills its own deep-seal trap, and the liquid so diverted from the operating-siphon fills or partially fills the trap to which said liquid is directed, while the deep-seal trap belonging to the other idle siphon to which no liquid has been directed either from the tank or the blow-off trap of



another siphon contains a less quantity of liquid than either of the other traps, and therefore has a weakened seal. When the tank is again filled, it is emptied through the siphon having the weakened seal, this siphon being the first to be forced, and the trap of this siphon, when operated, as well as that of the siphon to which liquid is diverted from the blow-off trap thereof, are filled to a greater or less extent, leaving the other siphon with a weakened seal, and therefore next to be brought into operation to empty the tank. This rotative order is maintained so long as the operation of the siphonic apparatus continues. This method of operation applies to a siphonic equipment employing three siphons and will be modified as may be required to adapt the general construction to more than three siphons. Reference to the weakened seal herein has regard only to the seal afforded by the liquid in the main or deep-seal trap of the siphon and has no regard to the seal of the blow-off trap.

The pipes by which fluid is diverted from the blow-off traps of the siphons to the deep-seal traps during the emptying operations of the siphons are designated by the reference-letters F F' F<sup>2</sup>, the pipe F diverting liquid from the blow-off trap of siphon B to the deep-seal trap of siphon B<sup>2</sup>, the pipe F' diverting liquid from the blow-off trap of siphon B' to the deep-seal trap of siphon B, and the pipe F<sup>2</sup> diverting liquid from the blow-off trap of siphon B' to the deep-seal trap of siphon B. The said liquid-diverting pipes are connected with the outer members E' of the blow-off traps, and the depth of seal of the said blow-off traps is fixed by the distance between the lower transverse pipes e and the level of the receiving ends of said diverting-pipes. The outer members of said blow-off pipes extend beyond the connection thereof with the diverting-pipes and above the maximum liquid-level in the tank to afford a free avenue of escape for the air imprisoned in the siphons at the time of release of air through said blow-off traps, though in some instances the air may be discharged through the liquid-diverting pipes. It may be observed that in practice the discharge of air through said blow-off traps acts to force substantially all the liquid therefrom through the open upper ends thereof and the liquid-diverting pipes. The said blow-off traps are filled during the emptying operation of the siphons through the inner members E thereof, and said inner members are made of ample diameter to insure proper refilling of the traps.

Before the tank A is filled, prior to the first operation of the emptying apparatus, the deep-seal traps of the siphons are filled or partially filled with liquid, one of the traps being filled to a less extent than the others. The trap having the least quantity of liquid

therein has the weakest seal, and is therefore the first to be brought into action.

In the following description of the operation it will be assumed that the seal of the trap of siphon B is the weakest after the traps have been preliminarily filled and will be the first to be brought into operation to empty the tank. After the blow-off trap of siphon B has been forced and the siphon started into operation a portion of the liquid flowing into the siphon is diverted through the pipe F to the deep-seal trap of siphon B<sup>2</sup>, which latter is an idle siphon at this time. The deep-seal trap of siphon B is filled by the liquid flowing therein, and the trap of siphon B<sup>2</sup> is partially filled by the liquid diverted therein through the pipe F. The siphon B' is also idle or non-operative at this time, and inasmuch as no liquid flows therein either from the tank or from a diverting-pipe the seal of said latter siphon is weakened, so that said siphon is next brought into action to empty the tank. When the tank has again been filled to the proper level to force the blow-off trap of the siphon B', having a weakened seal, said siphon operates to empty the tank, and during the emptying operation liquid is diverted through the blow-off trap thereof and the pipe F<sup>2</sup> to the deep-seal trap of the siphon B to strengthen the seal of the latter. The siphon B<sup>2</sup> at this time is an idle siphon, and inasmuch as its seal is not being strengthened by the flow of liquid therein it follows that after the tank has thus been emptied by the siphon B' and its trap has been properly sealed by the liquid flowing therein to the trap of the siphon B<sup>2</sup> has a weakened seal, and said siphon B<sup>2</sup> is next brought into operation to empty the tank. During the emptying operation of the latter siphon liquid is diverted through its blow-off trap and the pipe F' to strengthen the seal of the deep-seal trap of siphon B', thereby leaving the seal of the non-operating trap B at this time weakened and next to be brought into operation to empty the tank. The rotative order of emptying the tank through said siphons thus established is maintained so long as liquid is supplied to the tank A.

The extension of the inner legs E of the blow-off traps above the inlet ends of the longer legs of the siphons insures that ample time will be given to release the pressure in the siphons to start the same in operation before liquid rising upwardly into the short leg of the siphon can pass into said leg E of the blow-off trap. The inner leg E of each blow-off trap is made of sufficiently large diameter as compared to the diameter of the outer leg E' thereof as to insure the retention in said trap of a sufficient quantity of liquid to properly seal the trap.

The pipes F F' F<sup>2</sup> are located entirely above the floor of the tank A, so that said



pipes may be installed in the apparatus after the siphons have been set in their foundations A<sup>2</sup>, or the pipes may be repaired or substituted without disturbing the setting of said siphons. The outlet ends of said diverting-pipes are connected with the traps of the siphons by rigid downturned portions *f*, thereby effecting a comparatively rigid connection with said traps. The other or receiving ends of said pipes and the blow-off traps are loosely or non-rigidly fitted to their associated siphons. By reason of this construction and arrangement of the parts it will be observed that the said liquid-diverting pipes of the blow-off traps may be readily connected with the siphons already fixed notwithstanding the fact that the siphons may not be accurately aligned, there being more or less freedom of movement of the receiving ends of the said pipes to accommodate them to such inaccuracies of the setting of the siphons and traps. This feature of the construction is of considerable practical importance, inasmuch as the siphons are usually set by persons other than the one applying the auxiliary equipment. Therefore the person setting the siphon is not required to set the siphons accurately relatively to the distance apart thereof, and inaccuracies in the siphon setting does not add to the work or difficulty of applying the auxiliary liquid-diverting pipes.

It may be observed that in the arrangement herein shown the traps of the siphons to which liquid is diverted through the pipes F F' F<sup>2</sup> are not entirely filled during such diversion, but a given trap of an idle siphon is supplied with liquid to such extent as to strengthen its seal as compared to that of the other idle siphon.

I claim as my invention—

1. The combination with a liquid-tank, of a plurality of deep-seal, trapped siphons for emptying the tank, blow-off traps therefor, and liquid-diverting pipes, each connected at one end with the blow-off trap of one siphon and discharging at its other end into the deep-seal trap of another siphon.

2. The combination with a liquid-tank, of a plurality of deep-seal, trapped siphons for emptying the tank, blow-off traps therefor, and liquid-diverting pipes located above the floor of the tank, each receiving liquid from the blow-off trap of one siphon and discharging the liquid into the deep-seal trap of another siphon.

3. The combination with a liquid-tank, of a

plurality of deep-seal, trapped siphons for emptying the tank, blow-off traps therefor, liquid-diverting pipes each receiving liquid at one end from the blow-off trap of one siphon and discharging the liquid at its other end into the deep-seal trap of another siphon, the discharge end of said liquid-diverting pipes being connected rigidly with the deep-seal traps of said siphon and the receiving ends of the blow-off traps associated therewith having free or loose connection with their associated siphons.

4. The combination with a liquid-tank, of a plurality of deep-seal, trapped siphons for emptying the tank, a blow-off trap for each siphon comprising a leg which rises into the shorter leg of the siphon, and a vertical leg outside said shorter leg of the siphon connected at its lower end with the inner leg, and liquid-diverting pipes each connected at one end with the outer leg of the blow-off trap of one siphon and discharging at its other end into the deep-seal trap of another siphon.

5. The combination with a liquid-tank, of a plurality of deep-seal, trapped siphons for emptying the tank, a blow-off trap for each siphon comprising a leg which rises into the shorter leg of the siphon above the receiving end of the longer leg thereof, and a vertical leg outside said shorter leg of the siphon connected at its lower end with the inner leg, and liquid-diverting pipes each connected at one end with the outer leg of the blow-off trap of one siphon and discharging at its other end into the deep-seal trap of another siphon.

6. The combination with a liquid-tank, of a plurality of deep-seal, trapped siphons for emptying the tank, a blow-off trap for each siphon comprising an inner or receiving leg communicating with the air-space of the siphon and an outer or discharge leg which rises above the maximum liquid-level of the tank and liquid-diverting pipes each connected at one end with the outer leg of the blow-off trap of one siphon between the ends of said outer leg and discharging at its other end into the deep-seal trap of another siphon.

In testimony that I claim the foregoing as my invention I affix my signature, in the presence of two witnesses, this 11th day of October, A. D. 1906.

SIDNEY W. MILLER.

Witnesses:

WILLIAM L. HALL,  
T. H. ALFREDS.