No. 658,640. Patented Sept. 25, 1900.

B. R. GUION.

APPARATUS FOR PURIFYING SEWAGE.

(Application filed Jan. 2, 1900.)

(No Model.) 2 Sheets—Sheet 1.

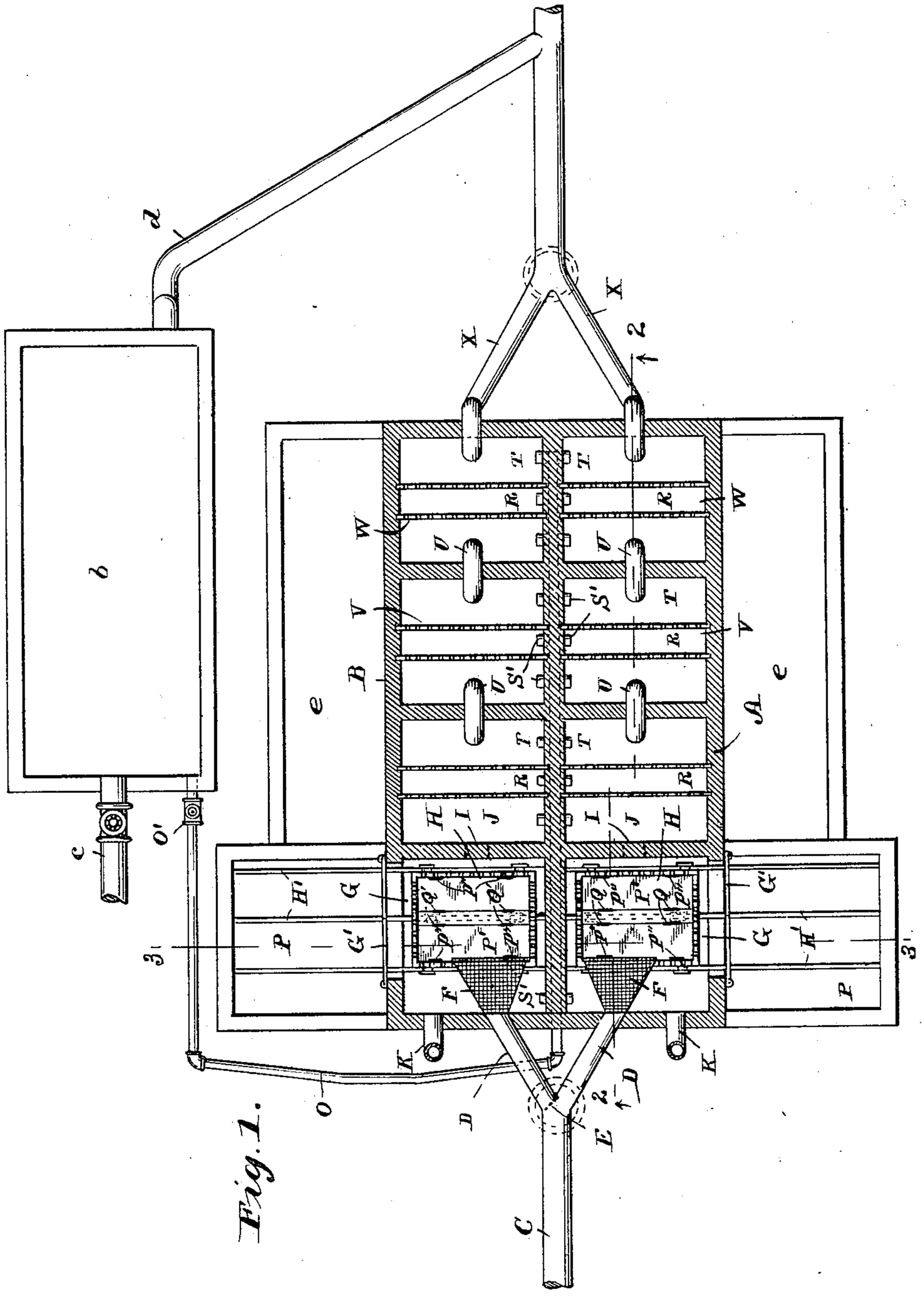

Fig. 1.

Witnesses

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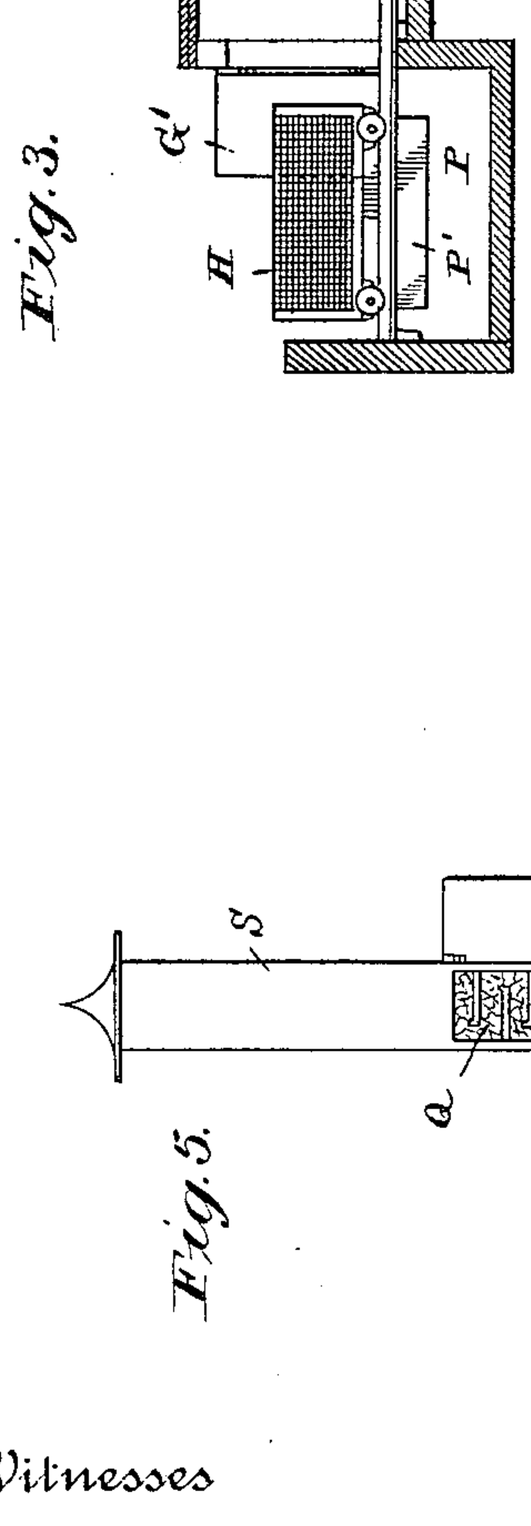

Fig. 3.

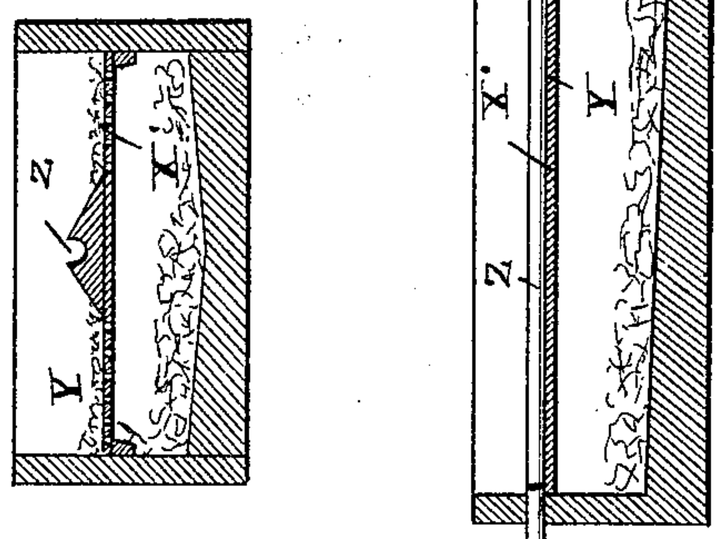

Fig. 4.

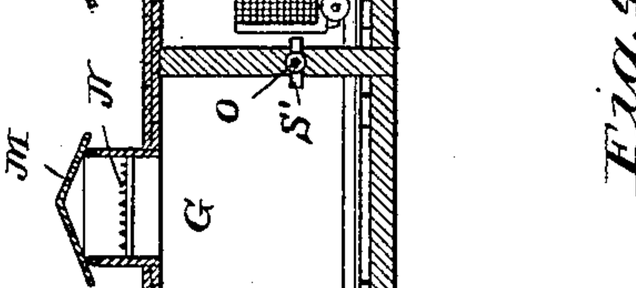

Fig. 5.

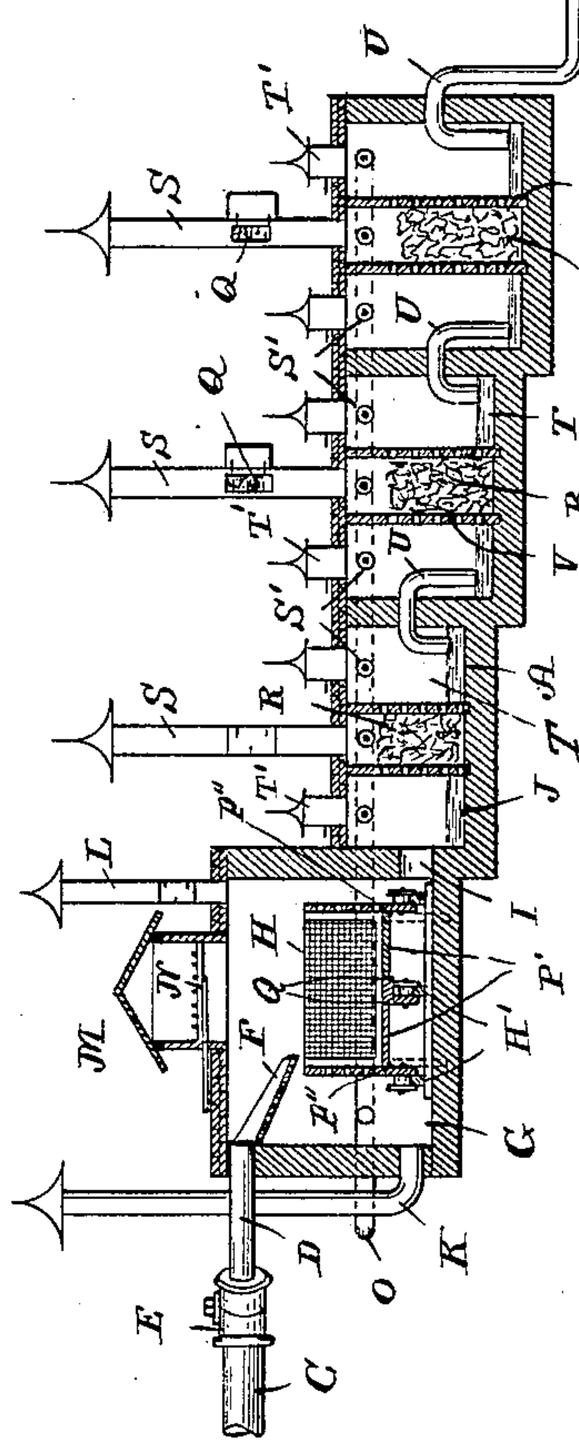

Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

BERNARD R. GUION, OF NEW YORK, N. Y., ASSIGNOR OF TWO-THIRDS TO ALEXANDER LUTZ, OF SAME PLACE, AND JAMES E. WALSH, OF DANBURY, CONNECTICUT.

APPARATUS FOR PURIFYING SEWAGE.

SPECIFICATION forming part of Letters Patent No. 658,640, dated September 25, 1900.

Application filed January 2, 1900. Serial No. 47. (No model.)

To all whom it may concern:

Be it known that I, BERNARD R. GUION, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Means for Purifying and Disposing of Sewage, of which the following is a specification.

This invention relates to new and useful improvements in means for purifying and disposing of sewage from cities and the like.

It is one object of my invention to provide means for the above purpose which is simple in construction, easily operated, cheap to construct, and perfectly practical. I avoid the use of chemicals, furnaces, or power-driven mechanism and provide a device which is substantially self-operating in that it separates the heavy matter from the liquids and then purifies said liquids.

My plant is further designed so that the desirable deposits therein may be separated, stored, dried, and preserved as a fertilizing agent of a particularly-desirable character.

Other and important objects of my invention will be apparent to those skilled in the art upon an inspection of the drawings and description hereof.

With the above objects in view my invention resides and consists in the novel construction and combination of parts set up in the accompanying two sheets of drawings, forming a part of this specification, and upon which the same characters of reference denote like or corresponding parts throughout the several figures, and of which—

Figure 1 shows a sectional plan of my novel purifying plant complete. Fig. 2 is a central vertical longitudinal sectional view on line 2 2 of Fig. 1. Fig. 3 is a cross-section taken on line 3 3 of Fig. 1, showing the cars in their two positions. Fig. 4 is a detail cross-section of the distributing or overflow pipe shown in the filtering-bed. Fig. 5 is an enlarged detail of one of the ventilating-stacks used in my apparatus.

My plant is preferably of a duplicate construction, being formed in two sections A and B, located side by side. An arrangement of this kind has several advantages, which will obviously be apparent to one skilled in the art. The design in question permits of the operation of one or both sections, as desired. This allows either one to be cut out at any time, whereby the same may be cleaned or repaired while in an idle position.

Referring to the characters of reference marked upon the drawings, C represents a main pipe, D D branch pipes, and E a valve which serves to deflect the flow of sewage from the main pipe to either of the purifying-sections.

Since the two sections A and B are alike in construction, I will make my explanation of one suffice for each by using the same reference characters and description to designate the corresponding parts in each set.

From the inlet-pipe D the sewage is discharged upon an inclined grating F, which insures a partial drainage of the liquid from said matter into the basin G. The bulk of the sewage, however, is discharged in a receiving-car H, the sides of which are perforated to insure perfect drainage into the basin G, before mentioned. This car, as will be seen, is mounted upon a suitable track H′, by means of which it can be run out through doors G′ into an adjoining mixing or storage chamber P. The bottom of the car is formed in two sections P′ P′, each being hinged at P″, so as to swing down and open, as shown by dotted and full lines in Figs. 2 and 3. These doors are also provided with a suitable catch Q′ for retaining them in a closed position. It is obvious that the hinged bottom is intended to release the contents of the car when the same is shifted over the pit of the mixing-chamber. The liquids of the basin G escape through the outlet I into an adjoining receptacle J. Said basin G is also provided with ventilating-pipes K and L, by means of which the foul air and gases may be permitted to escape. The heavier substances of the sewage are lodged in the receiving-car, where they are permitted to drain, after which it is sprinkled and purified with air-slaked lime from a receptacle M, located above the car. This lime-receptacle is preferably provided

with a grate N, which in practice is so arranged that the lime can be shaken down and distributed over the surface of the contents of the car, thus killing the offensive odors therefrom. When said ingredients are sprinkled, as above, the car is shoved out through the doors O into a storage-chamber P, where it is dumped and mixed. This chamber is preferably exposed and so adapted that the fertilizer can readily be loaded therefrom and carted off.

The lower interior of the ventilating-pipes K and L and all similar ventilating-pipes throughout my apparatus are preferably packed with charcoal, as shown at Q in Fig. 5, thus insuring the purification of the air as it escapes. I further provide a water-supply pipe O, by means of which the several compartments can be flushed out, if necessary. This pipe is provided with suitable distributing-pipes S′, which lead to the several compartments of the apparatus. The supply for this flushing operation may be taken through valve O′ from a surface-water storage-reservoir *b*, as shown, or from the city water-supply, if preferred.

From the receiving-chamber J the water is passed through a purifying-chamber R, which is packed with a suitable filter of gravel or the like, which has a tendency to filter said liquid. Immediately above this purifier I locate an air-shaft S, which is similar in construction to the one designated as L. As the water passes through this filter it emerges on the opposite side into a basin T, and from said basin it is siphoned out through the pipe U into a second filtering device, which I will designate as V, and from this it is likewise passed into the third filtering device W. The two last-named filterers V and W are similar in construction to the preceding one, described in detail, as will be obvious. It will be further noted that the filtering devices are not situated upon the same level, but are successively located upon a lower plane, thereby insuring the drainage of water from one to another through the siphon U, before mentioned. I also locate a lime-receptacle T′ over the several chambers J and T, which receptacles are of a construction substantially similar to that of the lime-receptacle M. Adjacent to each set of purifiers I situate a large mixing-chamber *e*, into which the sediment from said purifiers may be deposited and mixed when it becomes necessary to clean out the same. From the last of these filters the water is conveyed through a drain-pipe X into a trough Z, from which it overflows on the bed Y. This filtering-bed comprises a perforated floor X′, which may contain a top layer of ashes and an under layer of gravel. The object of the former is to catch and retain any ammonia or other fertilizing agent which may be present in the water drained therethrough. The filtering-bed is finally provided with a drain-pipe *a*, which may have its discharge in any suitable place.

My invention is preferably employed for sewage alone, and therefore I have shown a separate storage-reservoir *b* for surface-drainage. *c* represents the inlet-pipe for this reservoir, and *d* the outlet, which, as will be seen, is connected with the drainage-pipe *a*, before mentioned.

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

1. In a sewage plant of the class described, the combination with a receiving-basin, of a car mounted therein, an adjoining mixing-chamber, means whereby the contents of said car may be dumped in said chamber, a drain for the basin, a series of purifiers through which said drainage passes, vent-pipes for both the basin and purifiers, substantially as described.

2. In a sewage purification and disposing plant, the combination of a basin, a movable receptacle therein, a feed-pipe discharging into said receptacle, a storage-chamber adjacent to said receptacle, and doors in said basin opening into said chamber, a drain for the basin and a filtering device for said drainage.

3. A sewage-disposing apparatus, comprising a catch-basin, a straining-receptacle located therein, an inclined grating, a supply-pipe for said receptacle, a series of purifiers adapted to drain said basin, each successive purifier being situated on a lower plane to insure drainage of one to the other, a lime-reservoir located above the receptacle and adapted to feed the lime down upon the deposits in said receptacle.

4. A sewage-disposing plant consisting of one or more sections A and B, each of which comprises a perforated receiving-car, a basin in which it is supported, a lime-reservoir located above said car and provided with means for feeding said lime into the car, vent-pipes for said basin, a series of purifiers for the drainage of said basin, a filtering-bed Y to receive the drainage from said purifiers, substantially as described.

5. A sewage-disposing apparatus, comprising a movable receptacle adapted to receive the sewage, means to permit of its drainage, means for applying a disinfectant thereto, a series of purifiers through which said drainage passes, means for applying a disinfectant to the deposits in said purifiers, a track upon which said receptacle operates, a storage-chamber connected with said receptacle and means whereby said receptacle may be dumped into said storage-chamber.

6. The combination in a sewage-disposing apparatus, of a supply-pipe, a car to receive said sewage and having a hinged bottom, a track on which said car is mounted, a receiving-chamber connected by said track, a basin to receive the drainings from the car, venti-

lator-pipes for said basin and provided with suitable purifying materials, a series of purifiers for the liquid drainings of the car and basin.

7. The combination in a sewage-disposing apparatus, of a car to receive the deposits, means to separate the liquids from the solid while in said car, a track on which to convey said car, a basin in which said car is normally situated, a mixing and receiving chamber adjacent to the basin, doors between the two, means for draining the basin and filtering said drainage as and for the purpose set forth.

8. The combination in a sewage-disposing apparatus, of a perforated receiver, means for transporting and dumping said receiver into a storage-chamber, a basin to catch the drainings from said receiver, a series of purifying-compartments through which said drainings pass, a series of lime-receptacles adapted to supply said compartments, and purify the contents thereof, a water-supply pipe whereby the several compartments of the apparatus may be flushed, substantially as shown and described.

9. A sewage-disposing apparatus, comprising a perforated receiving-car, a basin in which it is located, a door in the side of said basin, a storage-chamber located adjacent to said door, vent-pipes for the basin, one or more purifiers, which comprise a receiving-chamber, a screened-charcoal receptacle through which the drainings pass, a siphon to convey the liquids to the adjoining purifier, and a vent-pipe located above said charcoal-receptacle.

Signed at New York, in the county and State of New York, this 2d day of December, A. D. 1899.

BERNARD R. GUION.

Witnesses:
WM. I. BROWN,
WALTER E. BROWN.