In the centre of the second compartment is placed an automatic valve "C," the said valve is caulked into a four-inch cast iron bend, as ordinarily used by plumbers, and which is securely built into the bottom of the tank during its construction. The top of the hub of the bend is usually left slightly lower than the level of the floor of the tank.

From the said iron bend is run a line of glazed tile pipe, four inches in diameter, having a connection with the fresh air pipe, for the purpose of ventilation, and a number of openings placed at intervals of two feet or more from which are run branches of four-inch field tile with loosely butted joints.

Fig. 2 shows a plan of the whole system and illus-



FIG. 3.

trates one way in which the tile may be laid, though, as will be manifest, they would do equally well if all laid in one side of the main carrier in any number of branches, of any length, providing a sufficient number in the aggregate are laid, and the rows are not placed closer together than two feet in light soil, and a somewhat greater distance in heavy soil.

The field tile should not be placed more than one foot below the surface, and must be perfectly level, for the reason that if given a fall the earth surrounding the low ends of the system would receive more than its share of liquid sewage, and might in time become fouled. While if level, the earth surrounding every tile has an equal amount of work to do, and will produce most satisfactory results.

Briefly then, the operation of the system is as follows:

The sewage from the building enters through soil pipe "E", filling the first compartment in which all solid matter is retained until it is reduced by the contained bacteria which multiply and develop very rapidly. In a liquid form it is allowed to enter the second compart-ment through overflow "F" which is turned down because of the presence of the bulk of the organic matter in suspension on or near the surface.

When the liquid has risen in the second compartment to the height at which the unlocking float on the valve has been set, the valve automatically opens, and discharges the contents of that compartment, be it fifty or a thousand gallons, into the system of field tiles, through which it percolates into the surrounding earth, to be taken care of by nature as already described.

As the tank takes from twelve to twenty-four hours to fill, it will be obvious that there will be abundance of time in which the water in the tiles may soak away

To prevent the gases of decomposition escaping through other than the proper channel the tank must before it again discharges. be covered first with rough plank and then with five or six inches of earth, which in turn, if desired, may be

In figuring out the size of tank necessary, the followsodded over. ing may be taken as a safe rule, viz :- for every occupant of a private house or hotel, allow three cubic feet of space in each compartment, while for a school or factory, where, as in the case of a house, nothing but domestic sewerage is to be treated, one-third less space will be sufficient, and for every cubic foot in one compartment (or one half the tank), lay thirteen feet of fourinch field tile.

It will be obvious that, as in the case of ordinary stable manure,; human excreta, if deposited in its solid state just below the surface of the earth, would entirely disappear in a very short time, and the system just described is merely a most convenient and sanitary way of automatically accomplishing that very desirable result, with the accompanying advantage of not only depositing it in the earth partially treated, but in a much more favorable condition to receive final treatment than could possibly obtain if the former method were adopted.

Anticipating the difficulty which will be encountered where there is a considerable fall in the ground surrounding the building to be drained, I would refer you to fig. 3 which shews a number of terraces each receiving a portion of the effluent from the tank.

It will be noticed that the end of the glazed tile is turned up a few inches on the brow of each terrace, the obvious result of which is that all the field tiles at that level must fill before the sewage can rise and overflow to the tiles on the next lower level, where the same operation takes place, and so on for any number of terraces, and as will be apparent, the sewage passing into the the tiles on a high level cannot possibly escape to those lower down, so that the earth surrounding every tile will have its full complement of work to perform.

Fig. 4, the horizontal scale of which is somewhat exaggerated, shews the proper relative position of the tank to the house where the field tiles have to be placed on a level considerably below that on which the building stands. In such a case it will be evident that were the tank placed on the high level, the discharge would come down with sufficient velocity to wash out both earth and tiles, while the discharge from the house to the tank as shown will not have any injurious effect on the latter.

In answer to a question which arises in the minds of most people I may say it will not freeze in winter, even when the frost penetrates the ground for several feet everywhere except where the tiles are laid, and as may be expected, splendid results may be obtained in vegetables or flowers if the tiles are laid under a garden.



FIG. 4.

In conclusion I would simply refer to a few of the principal points which should be kept in mind in constructing such a system, viz:

Have the tank covered with a few inches of earth, to prevent the escape of gases except through the soil pipe stack. See that the valve discharges at least once before the tunk is covered in. See that no trap is placed on the main soil pipe to prevent the free passage of air across the tank and up to the roof, and that the necessary space for the air is left in the top of the centre partition, and finally take care that no disinfectants or chemicals of any kind are allowed to enter the tank, if the life of the bacteria, upon which the system depends for its success, is to be preserved.