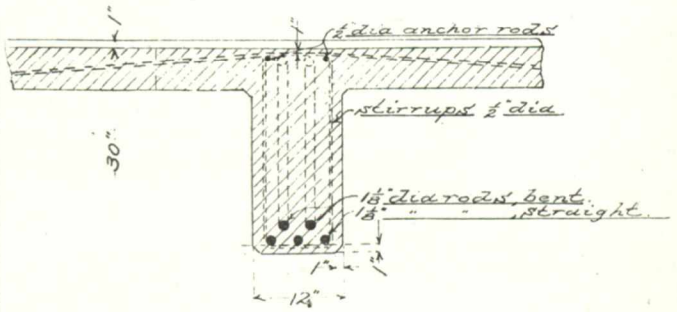
nitrification. I answer that turning it loose into and four feet deep, say, beneath the surface of the soil would be a mighty difference, since nitrifying bacteria do not exist in sufficient numbers at such a depth to be satisfactorily effective. The depth beneath the surface of the ground where unconverted sewage may be applied has everything to do with the degree of nitrification that can be accomplished. Applying organic substance to the very surface of the soil for nitrification can hardly be improved upon by artificial expedients.

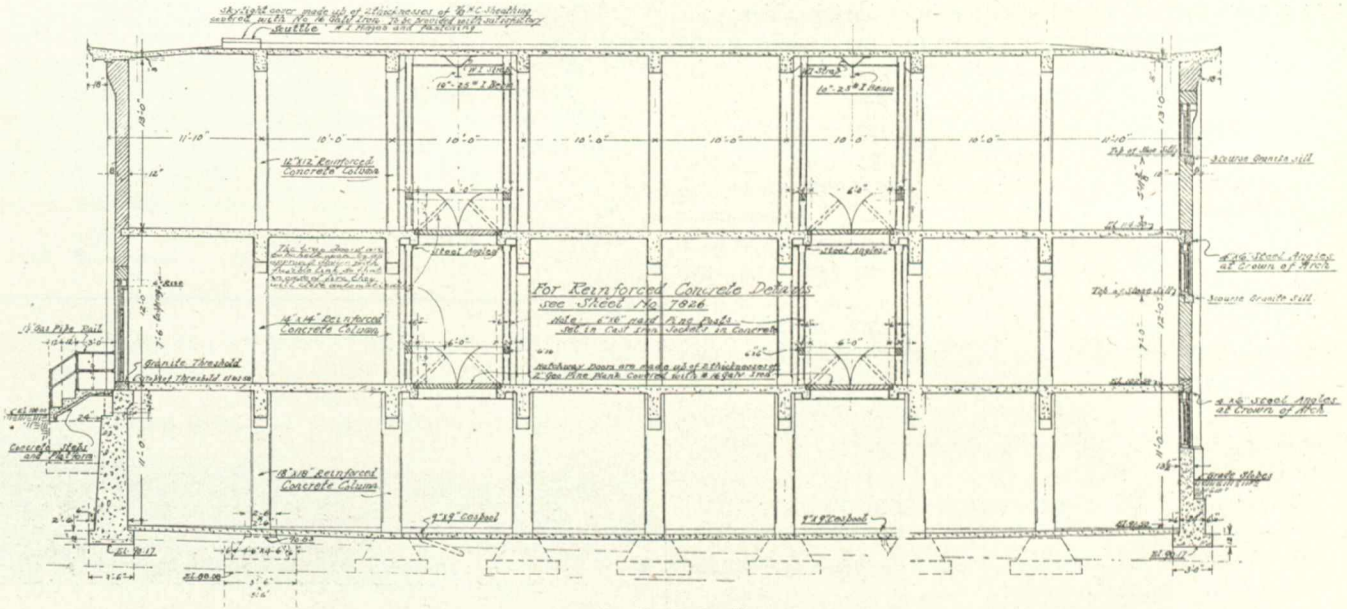
The filter bed, the underground nitrification duct or nitrification bed has, therefore, the object of producing the same final processes of purification as are so readily produced at the surface of the soil, and where quantities of sewage are not too large and the character and condition of the soil, water supply and a number of other essential items are fully understood, plants may be so designed for such known conditions as to successfully purify the sewage and then admit of the absorption of the filtrate or water into the soil. By this rational modern sanitary expedient the dweller is safe from the sorrow and desolation that may be caused by harboring that which sanitarians universally condemn—the cesspool.

COMPOSITE BRICK AND BUILDING CONSTRUCTION.

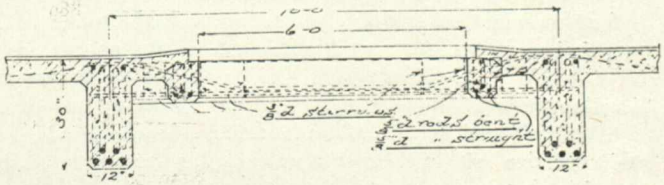
One obstacle in the way of securing cheapness in constructing reinforced concrete buildings is the cost of the forms which frequently cannot be used again. Mr. F. W. Dean, mill engineer and architect, of Boston, has recently designed a number of buildings with brick walls and reinforced concrete floors and roofs, which remove this obstacle and overcome the objections frequently urged against the appearance of reinforced concrete buildings. One building 48 ft. deep, 4 inches wide by 82 ft. long in outside measurement is two storeys in height with basement. The foundations are of concrete carried well below grade, the walls above are of brick 12 inches thick between pilasters of 20 inches thickness. Floors and roof are of concrete reinforced by galvanized wire cloth. The first and second floors, 6½ inches thick including "monolithic finish" are supported by integral reinforced concrete beams running crosswise of the building. These beams, 30 inches in depth by 12 inches in thickness, rest at their ends on the brick wall pilasters and at the middle are supported by reinforced concrete columns. They extend 16 inches into the pilasters and are bonded thereto by one inch parallel steel rods embedded in the walls.



Section of Floor Girder.



Longitudinal Section.



Section of Hatchways.

These rods, two at each end of the beam, pierce its ends at right angles. To make the bond still more secure the longitudinal top and bottom reinforcing rods are turned at their ends. On the sides of the building the floors butt against the brick walls, the granolithic finish filling in or smoothing over any space between the two. But at the ends these floors and the integral longitudinal hatch beams extend into and rest on the brick walls. The roof, 4 inches thick, is also reinforced with wire cloth, and bonded to the walls upon which it rests. The cornice, properly reinforced, overhangs 18 inches beyond the face of the pilasters.

The accompanying illustrations show the method of construction employed by Mr. Dean. The concrete girders and floor beams are connected to the brick work without difficulty.