These basins are needed to collect the solids which wash out from the filter at periodic intervals. Unlike the contact bed, the sprinkling filter does not require to have the filtering media renewed on account of the clogging because at certain times of the year the clogging solids are washed out naturally and the media becomes absolutely clear. If fresh sewage is applied to sprinkling filter very little nuisance arises from odor; with both sprinkling filter and contact bed previous tank treatment is usually adopted, the best type of tank being that which delivers the freshest sewage with the largest amount of settling solids removed.

None of the processes of sewage purification destroy completely the bacteria present in the sewage. Well-operated land irrigation areas and intermittent filters give the best grade of effluent but, as we have stated, are being largely superseded to-day by the more rapid methods. Under some circumstances it is desirable to obtain an effluent reasonably free from possible disease germs. In this case practical sterilization can be accomplished by the use of chemicals; hydrochlorite of lime or bleaching powder being most commonly used. This chemical, when dissolved in water, liberates active oxygen which is extremely efficient as a germicide. About 99% of the bacteria in sewage effluents can be killed by adding 75 pounds of strong bleacher per million gallons. Raw sewage can also be largely freed from bacteria by larger quantities of the bleach. Other methods have been proposed by sterilization, such as the use of ozone and of chlorine gas. The use of the former in sewage work is probably prohibited on account of its cost. There seems to be a good field for chlorine gas and several types of machines are devised for using liquid chlorine from cylinders.

STEEL WHEELS FOR MOTOR TRUCKS.

One of the most interesting developments in the steel casting business recently has been the increase in the use of steel wheels for motor trucks. Automobile engineers have turned their attention to steel because the high quality of wood required for truck wheels is being rapidly exhausted. Also, wood wheels cause a good deal of trouble by variation of size, and cannot be used successfully in very dry climates.

While the cast-steel wheel overcomes all of the above objections, it has the disadvantage of excessive weight, the development of cracks, and it is not as resilient as wood. The proper design of truck wheels of very thin section is helping to overcome this to a great extent, and a few steel casting concerns are building up a large business on cast-steel wheels.

The annual purchases of British electrical goods, exclusive of machinery, by Australia have risen within five years from £350,000 to £858,000; in the case of India, from £223,000 to £330,000; South Africa, from £99,000 to £307,000; New Zealand, £78,000 to £153,000; and Canada, £49.000 to £278,000; while the demand on behalf of countries outside the empire is hardly less remarkable, as exemplified by Japan, which last year purchased British electrical goods, exclusive of machinery, to £375,000, against £126,000 in 1908; Egypt, £395,000, compared with £23,000 in the former period; the Argentine, £268,000, contrasted with £148,000; and Brazil, £167,000, against £86,000. The United States last year bought British goods of this class to no less than £169,000, against only £9,000 five years ago.

TYPICAL SPECIFICATIONS FOR STEEL HIGHWAY BRIDGES.

THE Office of Public Roads of the United States Department of Agriculture has just issued a set of typical specifications for the fabrication and erection of steel bridges for highways. The bulletin, compiled under the direction of L. W. Page, is offered as a suitable guide for highway officials in fixing requirements to which bridge structure should be made to conform with a view to eliminating the prevalence of poorly constructed bridges, indicative of a lack of information on the part of highway officials concerning proper specifications for this class of work.

Two classes of bridges are considered under these specifications—those which carry suburban or interurban electric cars and those which carry highway traffic only. The former are designated as class A and the latter as class B bridges.

Types of Bridges.—It is recommended that the type of bridge employed be selected as follows:—

For spans up to 30 feet—rolled beams.

For spans from 30 to 40 feet—plate girders or rolled beams.

For spans from 40 to 80 feet—riveted low trusses or plate girders.

For spans from 80 to 200 feet—riveted high trusses.

For spans over 200 feet—pin-connected high trusses.

All parts of the superstructure except the floor shall be of rolled steel.

In computing the stresses the length of span for the trusses or girders shall be taken as the distance from centre to centre of the end bearings; and for the floor beams, from centre to centre of the trusses.

Width of Roadway.—For Class A bridges the clear distance between the centre line of the car tracks and the nearest truss shall be not less than 7 feet, and on one side the clear distance betwen the centre line of the car track and the truss shall be at least 12 feet. The width from centre to centre of trusses shall in no case be less than one-eighteenth of the span.

The clear head room for a width of 6 feet on each side of the centre line of the bridge shall be not less than 15 feet.

The ratio of depth of span shall be not less than the following: For rolled beams, 1/20; for plate girders, 1/12; for trusses, 1/10.

Loads.—The assumed dead load shall be not less than the total weight of the completed structure. The following unit weights shall be used in computing the dead loads:

Steel	490	pds. per cu. ft.
Concrete	150	" "
Brick	150	" "
Macadam	130	" "
Asphalt	135	" "
Sand or earth	100	" "
Stone	160	" "
Timber:		
Creosoted	5	pds. per ft. b.m.
Oak, untreated	4½	" "
Pine, untreated	4	" "

Class A.—For the floor and its supports and for the trusses of spans less than 50 feet in length the live load shall be assumed as follows: