should be taken into account. In some places a high rate of compensation can be introduced without harm; but in other cases the rate has an important influence upon the cost of construction. To adopt as standard a rate that is excessive for average conditions means waste of money and improper compensation. It was with this idea also that the meeting added the word "ordinarily" to the recommendation as originally formulated. It was suggested also in the discussion that on a line built exclusively for freight service, and having curves superelevated for low speed, 0.03% will be too much. The committee's report was accompanied by a table representing actual practice on different roads. This is given herewith, supplemented by figures from Tratman's "Railway Track and Track Work."

Railway Practice as to Grade Compensation for Curves.

N.Y., N.H. & H.	0.03 too light, 0.04 too heavy.
B. & O.	0.03 too light, 0.04 too heavy.
So. Pac. (At. Sys.)	0.03 too light, 0.04 too heavy.
*No. Pac.	0.03 too light; 0.04 fairly good results (not quite enough with curves frequently changing direction, slightly in excess for long continuous curves).
C., R. I. & P.	On 0.03 (with new rail) trains retarded at less than 10 m.p.h. and accelerated at higher velocities.
G. T. Pacific	0.04 too high for new rail.
N. Y. Central	0.03 made limiting grades on curves; 0.04 satisfactory.
*C., M. & St. P.	0.035 generally on maximum grades; sometimes 0.03.
P. & L. E.	0.035 satisfactory.
Erie	0.035 satisfactory.
N. & W.	0.035 satisfactory; trains accelerate on 0.04.
Car., C. & O.	Trains loaded for 1% grade accelerate on curves compensated 0.035.
*L. & N.	0.03 too low; 0.05 to be used.
W. & L. E.	0.03 used, but 0.04 preferred.
Can. Pac.	0.04 satisfactory up to 5°; too high for sharper curves.
Wes. Pac.	0.04 used, but probably higher than necessary.
Wash. & Ore.	Trains stalled or retarded on 0.04; 0.05 satisfactory. On 0.05 trains loaded for 10 m.p.h. on ruling grade tangents retarded; trains for 15 m.p.h. accelerated.
*Ill. Cen.	0.04. On Ind. So., 0.04 when curve was as long as maximum train, 0.03 when not more than half as long as train.
*Ph. & Read.	0.04.

* From Tratman's "Railway Track and Track Work."

A LOCK TIE BRICK COMPANY.

A new corporation, the Lock Tie Brick Company, of British Columbia, capitalized at $100,000, has been organized by Vancouver business men to take over from the Canadian Lock Tie Holdings, Limited, the rights to manufacture and sell in British Columbia Lock Tie brick. The head of the company is Mr. Louis A. Rostein, of the United Canadian Securities Agencies, and among the directors are Mr. J. B. Miller, general manager of the Clayburn Company, Limited, brick manufacturers; Mr. A. L. Russell, general manager, Evans, Coleman and Evans, Limited, and Mr. H. J. N. Hastings, of the United Canadian Agencies.

THE DISPOSAL OF SEWAGE SLUDGE.

Of the many difficult problems which the sewerage engineer is called upon to solve none gives him more anxiety than the one connected with the satisfactory disposal of sludge. In a paper read before the Royal Sanitary Institute Congress at York, England, Mr. Arthur Hindle and P. Holt Whitaker gave one solution of the sludge problem. The authors state that, in common with other engineers who are called upon to advise local authorities as to their sanitary arrangements, they have been faced with this difficulty, and at some sewage disposal works recently carried out under their guidance have installed a system of treating the sludge which has proved so efficient as to justify them in giving a brief description thereof in the hope that it may be of some interest to their professional colleagues. The system referred to was provided at the sewage disposal works which the authors designed and carried out for the Penrith Urban District Council.

Penrith is a market town in Cumberland, and has a population according to the last census of 8,993. There are no works or manufactories beyond two small breweries, so that, with this exception, the sewage is purely domestic. The original sewerage works for Penrith were carried out in the year 1850, and comprised a system of main sewers and sewage disposal works on the broad irrigation system on a large area of land known as Westmorland Holme, situate near Eamont Bridge, about one mile from the centre of the town. The new works, which are now practically completed, comprise an entirely new system of main and subsidiary sewers throughout the town, an outfall sewer about 2½ miles in length, including crossing of the River Eamont, which was done by means of a gravitating cast-iron pipe carried by a lattice girder bridge of 120 ft. span, and sewage disposal works on lands forming part of Whinfell Holme, which were acquired from Lord Hothfield, the price being fixed by arbitration. An area of 25 acres was acquired, but only about 12 acres have as yet been laid out. The subsoil is eminently suitable for filtration purposes, consisting of a deep bed of gravel, which is overlaid with about 2 ft. of fibrous soil.

The sewage treatment consists of sedimentation in tanks and filtration through land on the intermittent downward principle. There are four circular sedimentation tanks, each 40 ft. in diameter and an average of 7 ft. 6 in. deep, so arranged as to enable them to be worked on the quiescent or continuous-flow principle, either separately or in series, as circumstances dictate. Inlet and outlet channels, junction wells and controlling valves are provided. Before entering the tanks, the sewage passes through screening chambers, which are arranged in duplicate and fitted with Stott's revolving screens. Between the screening chamber and the mixing buildings there is a dividing well, whence the storm water flows to specially prepared areas. Three times the dry-weather flow passes to the works for full treatment, and three times passes to the storm-water beds. The buildings comprise mixing-house, small engine-house, with oil engine and pump, store-room, and office. Up to the present time it has not been found necessary to use any precipitants, but arrangements are made in the mixing-house therefor should their use ever be required.

After leaving the tanks the effluent passes over aeration weirs, thence into a main carrier, and is subsequently distributed by means of subsidiary carriers over the land filtration areas, which are underdrained with 3 in. agricultural tiles, the number depending upon the nature of the sub-soil in each area, and these in turn are connected to a main effluent drain, which discharges the purified effluent into the River Eamont, a well-known fishing river.

The levels of the outfall site were such as did not permit of the sludge being drawn off from the bottom of the tanks