

## MUNICIPAL ENGINEERS, CONTRACTORS, AND MATERIALS.

as the easiest way out of the slough into which they have gotten themselves, call in an engineer and unload the whole business on him. The digestion of so heterogeneous a mass is as distasteful as it is laborious, and on account of the time it takes is generally much more costly than if the engineer had been employed in the beginning, and had set up a single standard upon which all bids should be based.

The engineer for a public body is often obliged to award contracts to parties from whom he is morally certain that he cannot get the best results, simply because they are financially responsible and are the lowest bidders. The successful bidder takes the job with every assurance that all the requirements will be faithfully complied with, and very likely he fully means to do what he promises, according to his lights. But there is as much difference between bridge builders as shoemakers, and what would be considered first-class work in one establishment would not be tolerated in another. The engineer knows this, and he knows too, that in awarding a contract to one party he cannot, even if the bidder does his very best, get as good work as from some one else, for all the engineers in the world cannot get better work from a shop than it knows how to do. If he were at liberty to select his bidders this might be avoided, but on public work this cannot be done. The poorest work is turned out mainly by those builders whose mainstay is the pool, and if that can be abolished, many of the companies which turn out the worst work will have to close up, as their chief source of income will have vanished.

Brick paving has been laid in the city of South Bend, Ind., on a foundation of well rolled gravel, and is stated by the city engineer, Mr. W. M. Whitten, in a letter to "Paving and Municipal Engineering," to be as good or better surface after a years traffic as the brick paving in other cities laid on a concrete foundation. He also states that a street in South Bend paved with one course of brick is in better surface than one paved with two courses at a cost 30% in excess. Mr. Whitten lays all brick pavements with the courses at an angle of 45° with the course of the street, and believes that the pavement wears more evenly and keeps in better surface when so laid.

## THOROLD CEMENT

I have tested with Reihle's Testing Machine the tensile strength of six blocks made from the barrel of Thorold Hydraulic Cement sent me last summer. The blocks were made of neat cement, and were 1½ inches square at the smallest part. Four of them were kept 23 days in air, and only broke under the following weights: No. 1, 420 lbs.; No. 2, 470 lbs.; No. 3, 436 lbs.; No. 4, 420 lbs.; averaging 437 lbs. each, or 194 lbs. per square inch. The remaining two were kept one day in air and forty-seven in water, and broke under the following weight: No. 5, 420 lbs.; No. 6, 450 lbs.; averaging 435 lbs. each, or 193 lbs. per square inch.

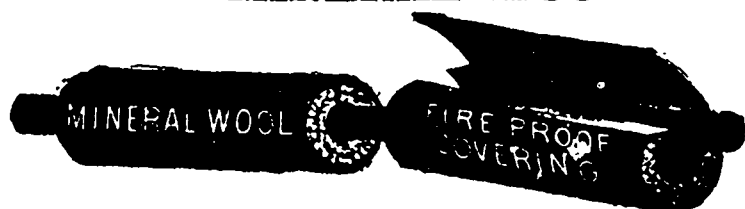
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Quebec, Montreal, Ottawa & Occidental R'y.

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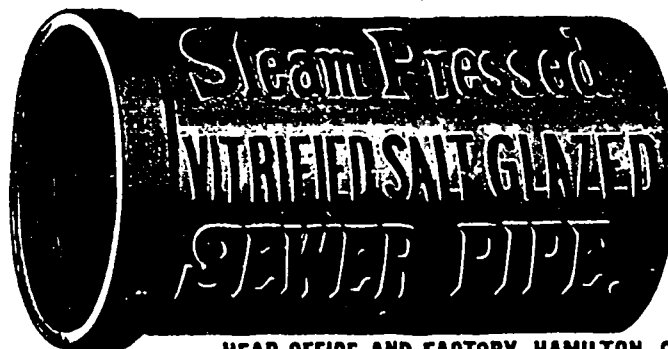
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