terial, leaving the lighter sands and soil on the surface for the winds to carry away.

Next after frost and water we have the gradual destruction of the roadbed by the ordinary processes of friction and impact, this wear depending on the hardness of the stone and the weight of traffic. With these must be classed also the injurious action of the roots of roadside trees. The roots, working their way through the foundation bed, have an effect much similar to that of frost and water.

In selecting road metal too much attention cannot be paid to its chemical composition. Rocks that easily disintegrate are soon carried away by wind and rain. Yet we must not use a material where the hardness is too high, else the metal will not bond.

ROYAL COMMISSIONS.

Every now and then we hear enquiries as to the payments made to members of Commissions, counsel fees, etc. At the present time engineers are interested in one particular Commission, and it might not be out of place to recall a few figures as to the Insurance Commission. Mr. Shepley, K. C., senior counsel, received a lump fee of $25,000. His assistant, W. N. Tilley, received, all told, $13,695. Miles M. Dawson, the actuarial expert, received (including expenses) $6,468. D. B. McTavish—Remuneration for services, $4,650; transportation expenses and living allowance, $947.80; A. L. Kent—Remuneration for services, $4,290; transportation expenses and living allowance, $1,087.50; J. W. Langmuir—Remuneration for services, $4,470; transportation expenses and living allowance, $768.08.

EDITORIAL NOTES

In our issue of May 8th, 1908, we expect to have a paper on "Ice Troubles in Power Plants," by John Murphy, consulting engineer, Ottawa.

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The Mining World of March 21st has an article by Mr. J. B. Tyrrell on "One Phase of the Ontario Mines Act." One cannot help but feel too much power is placed in the hands of mining inspectors. So long as a miner is doing development work on his claim it should not be possible for any Government official to depose him.

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The bill to incorporate the Institute of Architects of Canada has been re-printed. There is not much doubt that as drafted the bill will become law. The opposition that was so active some weeks ago has brought about the removal from the bill anything that would imply or suggest "close corporation." A Dominion Society of Architects, we hope, will never allow Provincial organizations to secure close corporation legislation that cannot be secured by the Dominion Society.

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The amendment to the Municipal Act of Ontario, which gives municipalities the right to enter private lands for gravel and to arbitrate as to price afterwards, will assist in road improvement in many sections. In the past the securing of gravel pits has been very expensive. Where a municipality and a landowner could not agree, two arbitrators were necessary, one to secure the right to enter the land, and another to fix the price to be paid. Occasionally the cost of the arbitration was more than the gravel was worth.

THE MIXING OF CONCRETE.

"The question is sometimes asked," so says Mr. Leonard C. Wason, president of the Aberthaw Construction Company, of Boston, "when to use a mixer. The answer is, when the cost of setting up, taking down, and transportation equals the difference in cost of mixing by hand or machine. It has been the writer's experience that under ordinary conditions concrete can be measured and mixed by hand for $1.30 per cubic yard, and by machine for 85 cents per cubic yard for the simplest method of setting up. The difference between these, 45 cents, times the number of yards to be mixed, will give the saving to be used in paying the general expenses of setting up a mixer, which for teaming a distance of three or four miles, setting up, dismantling, and returning, together with allowance for wear and tear amounts to $70. The cost of operating is included in the above cost of mixing. It will thus be seen that a job using 155 yards will be as cheap machine-mixed as by hand, and, of course, any larger job should invariably be mixed by machine. The size to use should be determined by the size of the job, and the amount which must be placed in one day. It is always best, however, to err on the safe side by having too large a machine than too small a one. Have one that is capable of mixing the day's work in three-quarters of a working day.

"The economy with which concrete may be mixed depends upon handling it in large masses without the requirement of much labor. It is possible, however, as the writer has learned by experience, to spend so much in the installation of an economical mechanical plant that the incidental costs of installation offset the saving in the cost of the mixing of a comparatively small volume of concrete over the cost of a very simple set up, with higher labor cost of operating. Therefore, trained judgment is always the best guide in the long run."

DEFINITIONS.

1. A watt is the amount of electrical power which is produced by one ampere flowing for one second at a pressure of one volt.

2. One kilowatt = 1,000 watts = 1.34 horse-power.

3. One horse-power = 746 watts = .746 kilowatts.

4. A British thermal unit is the amount of heat energy necessary to raise one pound of water one degree Fahrenheit.

5. One horse-power developed for one hour will raise 2,545 pounds of water one degree Fahrenheit = 2,545 B.T.U.

6. One kilowatt (1.34 horse-power) will in one hour raise 3,412 pounds of water one degree Fahrenheit = 3,412 B.T.U.

7. A theoretical horse-power is the amount of energy expended in moving a body one foot in one second against a resisting force of 550 pounds.

8. An indicated horse-power (I.H.P.) is a measure of the work done in the cylinder of an engine.

9. A brake horse-power (B.H.P.) is a measure of the energy delivered at the fly-wheel of an engine. For a given speed and a given load the brake horse-power of an engine is less than the indicated horse-power by the number of horse-powers required to drive the engine without external load at the given speed, and with the same pressures on the guides, bearings, etc.

10. An electrical horse-power (E.H.P.) is a measure of the energy delivered to the conducting wires by an electrical generator or to an electric motor by the conducting wires. If the generator be driven by an engine, then for a given load and a given speed, the electrical horse-power of the generator will be less than the brake horse-power of the engine by the number of horse-powers lost in the coupling between engine and generator, and in the generator itself.

Examples:—A gas engine which will develop 500 brake horse-power is belted to an electrical generator. If the losses in the belt and generator amounted to 60 horse-power the combination will develop 500 minus 60 = 440 electrical horse-power. If the annual charges on this plant were 10,000 dollars, then the annual cost of one brake horse-power would be $\frac{10,000}{500}$ = $20. On the basis of electrical hore-power the annual cost of one horse-power would be $\frac{10,000}{440}$ = $22.72.

From the H.E.P. Report on Producer-Gas.