AMERICAN ROAD MACHINE.

Read before the Victorian Institute of Engineers by Mr. P. G. D. LaVater on August 7th, 1895.

Mr. President and Gentlemen.—As any means by which the cost of engineering works can be reduced without loss of efficiency is worthy of consideration, and as I am under the impression that the particulars given below have not already been before the Institute, I beg to bring under notice the Patent American Road Machine as an economic implement to be used for road, railway and irrigation works. Nearly three years ago I was struck with the adaptability of this machine for road or railway work in fairly even country, and after several fruitless attempts I at length prevailed upon the Mildura Shire Council to purchase one from the agents (Messrs. Carolin and Co., 191 Collins street, Melbourne), with the result that the cost of road formation in the Mildura Shire has been reduced by over 7½ per cent. The cost of the machine is £85 duty paid in Melbourne. The following sketches will, I think, convey all information as to style of work suitable to machine, and also prices at which same can be done.

The prices quoted for road work are taken from contracts actually let by the Mildura Shire, and can therefore be guaranteed correct. The estimated cost for my proposal for railway formation is also reliable, as I had a small piece done for the inspection of the railway Committee when at Mildura, and I can at any time obtain the necessary men and horses to do the work at the price. I do not propose to give a detailed description of the machine, as doubtless many of the members have already had it under observation, and if not, full information is supplied gratis by the agents. The principle of the machine is that of a Crawder, and in favourable ground will excavate at from a penny to one and one halfpenny per c.y. From the principle of the machine it will be seen that it is only of use on fairly even ground where the earth has to be shifted laterally. In the case of uneven ground, where it becomes necessary to shift the earth longitudinally from the cuttings to the embankments, the use of the machine cannot be recommended. The machine can be worked with six horses and two men, one man driving, and the other working the gear, which, by the way, is of such a simple nature, that any ordinarily intelligent labourer can learn all that is required with only a few hours instruction. My experience has been in working the implement that the most economic method is with an eight horse team, as the extra horse power enables the team to move more steadily than is otherwise the case, consequently better work results. Another advantage for an eight horse team is that two four horse ploughs may be worked at once, and so keep both men and horses fully
The section of the railway embankment as per sketch is in my opinion very suitable for fairly even country. Drains and irrigation channels can be constructed, metal be spread, after being roughly tipped, to any required depth, firebreaks be made, and all at a corresponding reduction in price to the works set out in the sketches. One great feature in the use of this implement is the small cost of maintenance. Lately I had formed 70 chains of road formation 40ft. wide similar to sketch, at a cost of 5s. per chain, and soon after its completion heavy rain, followed by heavy traffic, cut up the newly formed ground. As soon as the ground was in a fit condition, the machine was sent to smooth over, and the time taken to make a first class job was a little over one-half day, and the cost under £1 5s.
DISCUSSION ON AMERICAN ROAD MACHINE.

MR. A. E. Phillips thought it was a very interesting paper on an important subject. Machinery had always found a larger field in progressive districts. Mildura deserved great credit, not only for her fruit, but also for some of her pioneers who had the courage to adopt machinery which had been very little used here. He had read reports on these particular machines at Stawell, and the records which were given appeared to him almost impossible. Roads were made in favorable districts at very much reduced cost. If this machine gave satisfaction at Mildura, why should it not extend to other portions of the colony?

The President said that he had a trial of a road making machine some time ago, and saw its capabilities for some such work as the reader of the paper had described. They would all recognize the difference between the cheaply, rapidly, and to some extent, partly constructed roadways in country shires, and the more perfect streets in cities. What might do for Mildura would not do for Melbourne. There was a point to be noticed, viz., that the extra convexity given to the roadway, gave it an unrammed appearance, nevertheless, there was a great deal of ingenuity in the machine. The same remarks would apply to railway banks, for men to be wheeling the stuff on to the banks was not altogether money thrown away, because they would give a sounder and more solid bank than a machine, and the machine was only good in level ground.
DISCUSSION ON AMERICAN ROAD MACHINE.

(Continued.)

Mr. Champion said that it seemed that this machine would be useful only under certain limited circumstances. The country would have to be fairly even. If the stuff had to be shifted to one side, it could be used; but not in any large excavations, where the material had to be moved from one end to the other. With regard to the cross section shown, some attention had been drawn to this at the last meeting, but the point had apparently been missed. It was evidently intended that 24' of the roadway should be available for traffic, and he thought that even for a country road the rise in the crown was rather excessive, being a gradient of more than 1 in 12. It was contrary to the practice in road construction, and if the rise were reduced to 9° it would be better.

The President (Mr. A. C. Mountain) thought that this could be accounted for in consequence of the material being simply heaped up. Traffic would consolidate this very considerably, and 13° would shrink very soon. This machine might be very useful in a country shire, where money was scarce, but it was inapplicable in towns.

Mr. Vernon agreed with the previous speakers. He had made roads, and saw a machine at the Agricultural Show, which claimed to do all that the machine under discussion was stated to have done. It excavated to a limited extent and raised the formation, but could not be worked in heavy country. It was only suitable in level country, and it was out of the question to use it where there were rocks or other impediments. With stumps, however, they could be moved before hand; but it was not suitable for general use. He did not like high formations; 13° might be good for light traffic, but he had seen a formation raised 3° in the middle, with a 30' road. The condition of that road in winter was very bad. This was a road near St. Arnaud, on a dead level, many miles long, made at great cost. The traffic was confined to the centre of the road, whilst it had been made flatter it would have worn better. As it was, there were three tracks—one for the horses and two for the wheels—and the water could not get away.

Professor Kernot, as a road user and observer, though not a road maker, agreed that the three tracks very speedily appeared in a road with a high crown, and that the last state of the road was worse than the first. A fairly broad surface and distributed traffic was far better. A road and a railway were opposite in this respect. In a railway the traffic was confined to one track, but it was made of the hardest possible material, i.e., steel.

Mr. Turner had observed the same trouble with the three tracks, and asked how to remedy this matter on a narrow road?

The President thought it would be cheaper in the long run to use tram plates. One of the first things he had to report upon when he took office in Sydney, was to point out the convexity of their roads. He got the City Council to view the matter from his standpoint, and if he had done nothing else he had altered entirely the form of convexity previously adopted, and "made the roads more serviceable. One of the old kind of roads was to be seen on the road to Parramatta. If a road had a good hard surface, as long as it had sufficient crossfall, the water would drain off; if it was convex, but not solid, then every pocket would hold water, and it would not be a good road."
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