and steamers, and the workmen to and from their labor. If a live wire is used, when the track is idle, it could be cutting wood with a platinum wire incandescent, or hauling logs up by steel-wire rope and pulleys. In fact the water-power in form of electricity would accompany our pilgrims, like the stream from Horeb, to lighten their toils, supply their wants, and be a "pillar of fire" over their home at night. As soon as land enough is stripped of the forest to furnish a few fields, cattle and sheep would gladden the landscape, gardens bloom, and comfort begin to prevail. To every share a coupon might be attached, entitling holder to a village lot, a park lot, or a farm block, as he preferred. Each would thus own a spot of earth of his own as a home, and would love it as his. As the road progressed inland, new power and resources would be developed; a fresh base of supply secured where it would intersect the C.P.R.; branch lines occupy valleys leading too far from main line; mines, fire clay, mica, building stone, and other valuable materials, would be found, and what is now the wreck of the lumberman become a scene of prosperity and beauty, and a veritable backbone to the province. Mechanics, farmers, day laborers, and men of leisure, might all join in the harmonious development; the shiftless could not get in; the dissolute would find no attraction; whiskey would have no place in the plan, but the schoolmaster would be in every hamlet, and the messenger of glad tidings have a permanent pass on that railway. Managers and foremen would be elected only from shareholders and by shareholders.

In the course of sixteen years' sojourn in Eastern Algoma, half of which was spent in travelling along construction work of C.P.R., or fire ranging and prospecting for timber and minerals, I have satisfied myself that there is room for a large population of prosperous farmers and mechanics who might carry with them many of the advantages of the older settlement, as well as leave many of its drawbacks behind. Where consumption is only found in hereditary cases, ague unknown, malaria only resulting from gross neglect of drainage about sawmills, the water strong in iron and free from lime, and north of "the blizzard line" in winter, but with more sunshine in the year than anywhere further south—this district has much to commend it. All hardy fruits ripen, and the field strawberry, currant, plum and cranberry, are indigenous in every part. I might indicate four or five lines of profitable settlement, but some lawyer would be likely to take up the harbor and so block the entrance; but on general principles, I may suggest a line starting east of the outlet of French River, running north, crossing the river, touching the extreme west arm of Lake Nipissing, the C.P.R. at Markstay, and thence up Sturgeon River, etc., to James' Bay. This would all be in new territory and chiefly clay land. Another would open up the Mississagua settlements, cross near Chapleau, and follow down the Moose. The first thirty miles of this route is fairly well settled, the balance little known. Short lines by the dozen could be projected along the "Soo" line, opening good areas of land, and utilizing fine water-power.

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For THE CANADIAN ENGINEER.

A QUESTION IN MECHANICAL DESIGN.

BY R. W. KING, M. CAN. SOC. C.E.

It is general in bicycle construction, where the pedals are screwed into the outer ends of the cranks, to have a right-hand thread in one crank and a left-hand thread in the other. Standard pedal makers also make their pedals in pairs, the spindle of one having a right-hand thread and the other a left. The question is: on which side of the bicycle should be the pedal with the left-hand thread? The reasons for asking are that somebody wants to know, and some one is not satisfied with the answer and reasons given by some who claim to know.

In the point above referred to exception has been taken to the practice carried out by some firms of bicycle manufacturers, one of whom claimed that every detail of manufacture has been based upon scientific tests, made under the guidance of a council of twenty-one "expert engineers" (names not being given). Can it be possible that in a multitude of such counsellors there is not always safety?

We take it to be admitted, in the first place, that the object for putting a right-hand thread on one pedal spindle, and a left on the other, is that the friction between the pedal and its spindle may tend to screw the spindle into the crank end, and keep the parts in place should they by accident have become loose, for the same reason that the nuts that keep the wheels on a wagon axle and such like are made with right-hand threads on the right hand side of wagon, and left-hand on the left side. That was originally a great idea, when one comes to think of it—well worthy a council of 21 engineers even, and is an abiding tribute to the ingenuity of man.

In the mechanism first referred to, the threads are found arranged as above stated; but let us examine the conditions here, as they are different to those of the wagon.

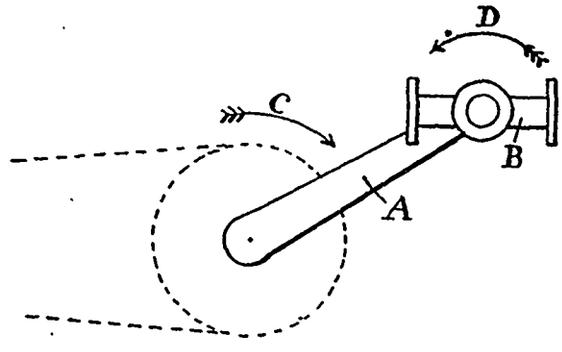

Fig. 1

Let *A*, Fig. 1, represent crank on right-hand side of bicycle, *B* the pedal, which is practically held in the same horizontal plane while forcing the crank to revolve. The revolutions of the crank round its axis being in the direction of the arrow *C*, the revolution of the pedal round its axle will evidently be in the reverse direction, as indicated by arrow *D*; therefore, ordinarily speaking, to allow for the lightening of the pedal spindle by the friction of the pedal, the thread on this spindle should be left hand. When this has been pointed out, it has been admitted correct under ordinary circumstances, namely, without ball bearings, but we are told to look further, as it has been decided and actually shown by experimental tests under competent super-