LARGE VERSUS SMALL CAR WHEELS.

By HERBERT WALLIS, Superintendent of the Mechanical Department of the Grand Trunk Railway.

THE practice of using 33-inch car wheels is so general that perhaps an assertion that we have, during all these years, been making a very grave mistake may not readily be admitted, and yet a careful consideration of the subject and comparison with work on railways in other countries, coupled

railways for the half year just ended was about 5 cents per train mile, and the cost of maintenance of permanent way about 14 cents; and notwithstanding the larger amount which is annually expended there for renewals, these figures are little more than one half of the cost per mile of American railways.

I am assuming that a wheel of 42 inches in diameter (which is the standard of English railways) is the largest that can be used without raising the height of our passenger cars, and

Although undoubted success has been obtained from the use of steel tires on this railway, what is now advocated is the increased diameter of the wheel only.—*Railroad Gazette*.

APPEARANCE OF SNOW FLEAS.

CHARLES M. NES, of York, Pennsylvania, writes to the Smithsonian Institution that with the snow fall of the 6th of January (about 12 inches) there appeared myriads of

Fig. 2.

with experiment, will show conclusively that there is plenty of room for such an assertion.

Great Britain has introduced our style of cars, both day cars and sleepers, with undoubted success, and it does appear that we shall yet, in return, be taught by her an excellent lesson in the matter of wheels.

Figs. 1 and 2 show the six-wheeled truck, commonly used under Pullman cars, adapted to this increased diameter.

The advantages in favor of the large wheel, briefly expressed, are as follows:

- 1st. The reduced cost of maintaining the permanent way. This will be readily conceded, when it is considered that not only is the bearing surface of the wheel upon the rail practically very materially increased, but that at a given rate of speed the 42-inch wheel makes 21 per cent. less revolutions.
- 2d. The saving in maintenance of wheels, with reference to which the remarks on reduced cost of permanent way hold good.
- 3d. The decrease of frictions on the journals and bearings, due to the reduced speed. The advantage gained under this head, not only in reducing the expense of lubrication, brass and axles, but in, as has been most unmistakably proved, almost entirely doing away with the delay and annoyance caused by hot boxes, would repay the extra outlay incurred.
- 4th. The gain of car mileage, the cars being less frequently off duty for renewals of wheels.

"springtails" or *Podura*, samples of which were inclosed, covering the surface of the snow to such an extent as to entirely discolor it. The phenomenon extended over an area of country two miles in length and half a mile in width. In a later communication Mr. N. says: "They were in clusters, and where I gathered the specimens I had simply to take them up by handfuls; the snow was literally covered. They still exist in great quantities on fences, bushes, stones, etc., in the vicinity where they first fell."

Fig. 4.

Fig. 7.

5th. The decreased friction of the train will enable an engine to haul a heavier load with the same amount of fuel.

6th. The cars will ride with greater ease, and the comfort of passengers be proportionately increased.

The experiments made on this road during the past two or three years, and now being made, have resulted in the adoption of a wheel of 42 inches in diameter for passenger car service, and it is desired to use the 36-inch for freight cars.

Without advocating any particular class of wheel, Figs. 3, 4, 5, 6 and 7 show the designs now in use on this railway; and it is now tolerably well ascertained that a wheel on the principle of Fig. 3, 4 or 5, properly constructed, and having a hard tire 3 inches thick, will run without difficulty in Pullman car service from four to five hundred thousand miles.

The cost of such a wheel is little more than three times that of the ordinary chilled one, which, if we assume to average a mileage of fifty thousand, the gain in point of actual economy is fifty per cent. in favor of the large wheel, to say nothing of the saving in operating expenses and the absolute immunity from accident caused by breakage.

The question, however, whether the wheels should be cast iron or steel, or compound with centers of cast or wrought iron, is one to be solved by experiment only, and that, of course, to the satisfaction of the road using them; but it is important that if steel tires be used they should not be less than 2½ and, if possible, 3 inches in thickness.

Dr. J. G. Morris, of Baltimore, also reports a similar appearance about ten miles north of Baltimore, about the same time, and last season they were observed in numbers near Sandy Spring, Maryland.

They are probably the *Podura nivicola*, which are found under the bark of trees and in similar situations, as their food consist of decaying vegetable matter. They do not fall with the snow, as is supposed by many persons, but are attracted by it and suddenly appear upon it in countless numbers, becoming at once conspicuous and interesting objects.—*Field and Forest*.

Apart from the extra dead weight of our cars as compared with paying freight, caused chiefly by their extra length and peculiarities of our traffic, can we not trace much of the extra cost of working to this difference in the size of our wheels, not only in the car, but also in the permanent way department? My own belief that it is so must be my reason for writing you on the subject.

The average cost of working the car department of English