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The Railway of the Future.

By Adolphe Davis, C. E.

About 60 years ago England gave birth to the steam surface railway & inaugurated the present system, & now it is again about to inaugurate the railway of the future. England waits the proper time before accepting new inventions, & does not spend money uselessly. Her people will generally make sure of a new undertaking, & will wait to see if anything better will turn up that can replace what is already in operation with lasting advantage. They have waited 60 years for new developments in railway systems, but there has been comparatively no change in the last 50 years, although it is to be admitted that the speed has been increased on passenger trains during the past 40 years by about 20 miles an hour. The changes made have consisted chiefly in making the cars more comfortable for the traveling public. In America the weight & size of the railway rolling stock have been increased greatly for the sake of facility & economy in operating; but not so rapidly in England. The latter have correctly believed there is a limit, have stopped increasing the weight of their rolling stock, & have turned their attention to devising means to meet the present conditions, which demand greater facilities & quicker means of transit, combined with more absolute safety.

American railway managers have as yet seen no limit, & they are increasing the size of the carrying capacity of their rolling stock; engines are also increased in power & corresponding weight: all this with one idea in view—to reduce the cost of operation of their line. The means adopted appear well calculated to give the companies the desired result. The main result of the practice is the great saving of man labor; in fact, the managers will tell the directors of their companies that in place of two trains being required to move a given quantity of freight, one train with one staff will do the work, so that 50% is saved on engine drivers, firemen, conductors & brakesmen, & 50% on locomotives. This is for freight trains only, as on passenger trains the service remains the same. When such a report is made at a directors' meeting, there are smiles & happiness all around. Generally there is mention made of the great saving made by steamship companies in replacing the small steamers with those of four times the carrying capacity. Here, no doubt, a great saving is actually accomplished. A large expensive steamship will replace, say, four of the smaller ones, but it cannot be compared with the change that follows an increase in the carrying capacity of railway rolling stock.

In changing from small steamers to the large ones, one steamer takes the place of four—hence one crew, one set of officers, one set of engines & boilers; in fact, one complete ship at sea, one steamer berth at harbor—all in place of four. It is true that the crew will number a few more men than on a small steamer. The consumption of coal is greater, but not nearly as much coal will be used as on four smaller ones. The risk of accidents at sea is lessened by 75%, therefore the saving must be very great. Also, the steamship company does not have to lose the small steamers, as steamers of almost any size can be put into service at various classes of carrying on the sea. This considerably reduces the expense necessitated by the change—& the extra expense ends there.

With the railway it is different. In place of one ship, thousands of new cars are required, & in place of one engine, hundreds of new locomotives are needed. This is not all. The very moment this new heavy rolling stock is ready to be put into operation, new & heavier rails, new & larger ties, & new & stronger bridges are required for the whole line. There must be new turn-tables for locomotives, the roadbed requires additional ballast, & in many cases new engine houses are needed. In the repairing shops additional machines to take in the larger parts of the larger locomotives will be necessary; in fact, the companies may look to the expense of a new railway, less only the right of way & roadbed. In addition, there is an almost total loss of the rolling stock, rails, bridges, etc., previously in use, as most of it can only be scrapped at best. When the change on a few of the trunk lines takes place, all other lines must follow or they cannot compete, Old rolling stock will be discarded, at very great loss. When all the cost of this change has been correctly estimated, after the interest has been paid on many millions of outlay, the net receipts may not be so large as were expected.

Again, the maintenance of the new heavy rolling stock, & the wear & tear of the rails, bridges, roadbed, & the rolling stock itself, must be much greater. The same number of bearings have greater friction, hence a large increase in cost of lubrication & wearing material. The roadbed & bridges will suffer in proportion, & extra friction will have to be applied to the wheels to stop these heavy trains & to moderate their speed on down grades. On the up grades the strain will be greatly increased. Additional losses are likely to result from accidents, for, although the system of steam surface railways has been in existence about 60 years, there have been comparatively no improvements outside of the enlarging of the cars & locomotives & making them stronger & more comfortable for travellers. Except for these attempts to imitate the extravagant luxury of hotels, the system is practically the same. The speed of passenger trains has been increased about 20 miles an hour in 40 years. The cost of transit for persons & freight remains about the same.

While various devices have been applied, the only one which has been of any consequence in minimizing the number of accidents to the employes is the automatic coupler, which is still far from perfection. The number of accidents on railways of all kinds & under all circumstances have been continually on the increase, the cause being that the competition of railways has become greater as new railways have been built. Railway managers have had in view only cheapness of operation of their lines. Cheap material & construction has been used, anything that would call for a little additional expense for the minimizing of accidents not being entertained. In large cities railway traffic is so congested that accidents are almost of daily occurrence. The question is, What is to be done to insure safety of travel on railways, together with quicker transit?

The elevated electrical railway will no doubt be the railway of the future. They are about to build an elevated railroad in a district full of railways between Liverpool & Manchester. This would seem to prove that the builders are reasonably assured that the new mode of transit will gradually take the place of the surface railways, both for passenger & express freight.

The considerations which make in its favor are several: First—There is the surety that an elevated railway can be made so as to insure positive safety from all accidents, though the tramway be running at 100 miles an hour or more, because from its position there can be no contact with moving or other objects, which are numerous on the ground surface. There can be no accidents from floods or washouts, landslides or misplaced switches, nor from broken wheels or rails, from collision or as the result of any one putting obstructions on the track. In the case of trains following each other, the connections would be cut from the power of the following train by the operations of the first train, should the latter be stopped because of any unforeseen emergency; so that the following train would have no propelling power in case of the necessity to stop the first train, & the electric signal would automatically strike the bell on the train that followed. As to falling off the track, that would be prevented by a gab-grip that would follow the T of the top cord of the truss, so that it would be impossible for the wheels to mount the rail or get the body of the car lower than the top cord of the girder, only four inches distant. The side of the car is also protected by the sides of the girders, which have a flat, smooth plate running on both sides, which would come in contact with rollers fitted on the sides of each car. No snow to ever block the line or cause any expense or accidents; no grades of any consequence, so that the uniform speed would be constant; no short curves to create danger or extra friction; the track would always be uniform & the car would always run very smoothly; no dust, sand, cinders or grit to cut up bearings & machinery; thus all axles could be made to run smoothly in ball bearings with comparatively little lubricant, & the cars would be free from smoke & dirt of any kind. One can fancy the comfort to travel in cars that are perfectly safe, running smoothly, with good & clean ventilation, & the enjoyment of viewing all the surrounding country as a great panorama.