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The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are *sharp*, the articles *short*, and the facts *authentic*, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

MANEUVERING POWER OF TURBINE STEAMSHIPS.

Gradually the disabilities under which the steam turbine labored at its first introduction are being removed; and, when we bear in mind that the practical steam turbine is still in its youth, it must be confessed that the development to perfection is very rapid. The latest success is recorded in connection with the new channel steamer "Dieppe," which has recently been built by the London, Bright and South Coast Company, in association with the Western Railway of France. These two companies having in view the supposedly poor maneuvering qualities of vessels driven by the steam turbine, decided, in placing the contract for the new steamer, to impose exceptionally severe conditions in the starting and stopping tests. A clause was placed in the contract requiring that, as part of the acceptance trials, the boat must be required to pass a certain mark at a given speed and be brought to a state of rest before passing a second mark boat placed at a specified distance from the first boat. The conditions were considered to be so onerous that there was considerable difficulty in getting a bidder, the contract finally being placed with the Fairfield Company. The two mark-boats were moored at a distance of 100 meters, or 109 yards, and the steamer passed the first boat at slightly over the specified speed of twelve knots an hour. The turbines were at once reversed, and the steamer stopped and began to go astern a few yards short of the second mark-boat. It is stated that the time taken in coming to a full stop was 40 seconds. This is an excellent performance for a vessel driven by screw propellers, and places the turbine steamer well on a par in respect of its stopping ability with those driven by reciprocating engines.

In this connection it is gratifying to observe that the value of turbine propulsion for commercial vessels is beginning to be recognized by our steamship companies; for in addition to the turbine steamer recently ordered for a steamship line running between this city and Boston, the Southern Pacific Railway has recently ordered a freight and passenger steamer for the Morgan Line, whose motive power will consist of Curtis turbines. The new vessel will be of considerable size, with a length over all of 440 feet, a beam of 53 feet, and a loaded displacement of about 10,000 tons.

STEEL CARS AND SAFE TRAVEL ON STEAM RAILROADS.

The time has certainly come when the steam railroads of this country should commence systematically to remodel their rolling stock, at least as far as the passenger cars are concerned, and this remodeling should take the form of the introduction of the all-steel car whenever new equipment is ordered. From whatever point of view we look at it, the all-steel is superior to the wooden car. It is stronger, stiffer, and if it be made with careful attention to the design, lighter. It is pre-eminently safer for the passenger, for it simply cannot be telescoped; and it is absolutely fireproof. When the New York city subway was opened, the management had the foresight and courage to adopt the all-steel car boldly as its standard type. It took courage to do this, for it was the common impression that steel cars would be far more noisy than those built of wood, and it was generally believed that such cars would be stiff and formal in appearance, and would not lend themselves to successful interior work. The popularity of the Subway steel cars and their general behavior in service have fully justified their introduction in the Subway. If anything, they are less noisy; they certainly run with greater steadiness; and, for our part, we confess that perhaps because of their hygienic appearance they give an impression of greater cleanliness. The Subway people are so well pleased with them that, as fast as the steel cars arrive, the wooden type is being withdrawn, and before long there will not be a wooden car left in the whole system. It goes without saying that the strongest recommendation of the steel car is the great protection it affords to life and limb. During the Subway strike it was demonstrated in certain collisions that occurred between trains made up of alternate steel and wooden cars that the energy of the collision was expended in crushing up the wooden cars, those built of steel coming through the ordeal practically intact.

The loss of life in collisions on steam railroads has been due chiefly to the telescoping of the cars and the subsequent fires that have broken out in the wreckage. Yet, although in a collision between two all-steel trains both of these prolific causes would be eliminated, it must not be supposed that the passenger would run no risk whatever. The comparative immunity from injury of the passengers in the rear part of a colliding train is due to the fact that the momentum of the rear cars is absorbed gradually in crushing up the forward part of the train. The wooden mail cars, baggage cars, and day coaches act as a cushion or buffer. In a collision between two all-steel trains, however, the shock would be comparatively evenly distributed throughout the whole length of the train, and motion would be, even in the last car, almost instantly arrested, unless, indeed, as might well happen, the cars mounted upon one another or slewed around crosswise of the track. The effect on the passengers would be to hurl them forward in their own cars until they fetched up against seats, partitions, or furniture, with a velocity not much less than that at which the train was traveling at the instant of collision. There would undoubtedly be many broken limbs and painful contusions; but there would be none of that horrible laceration which now occurs when the splintered timbers of a telescoping car shear their way through the crowded mass of passengers.

In building the all-steel day coach, special attention will have to be paid to the method of attaching the cross seats to the floor of the car. The supports must be of good tough steel, thoroughly well bolted through to the steel floor. Otherwise, if the present rather flimsy supports and fastenings were used, the sudden arresting of motion would tear every seat, with its occupants, loose, and cause the huddled mass to sweep forward along the floor of the car to fetch up against the front of the car, with disastrous effects to life and limb.

RAILROAD HOUSEKEEPING ECONOMIES.

The housekeeping side of a great railroad is generally kept in the background, and the annual expenditures and income from this source seldom figure in the year's balance sheet which the public sees in print. Under the general heading of "minor income and expenditures," however, there appear items which might well excite the interest and amusement of the casual student. Whatever else may be said about our great railroad systems, good or bad, they have never been accused of lack of careful, systematic operation in the expenditures of the great sums of money which must annually be made for efficient maintenance. There is no stricter and better business school from which a young man or woman can graduate than one of the great trunk railroad systems which criss-cross our continent in all directions.

A single railroad system will have upward of four or five hundred stations along its different routes, which must be supplied with certain household articles and utensils for good housekeeping. Every modern railroad appreciates the value of clean, sanitary stations, and these temporary stopping places for the traveling public are kept in better condition each succeeding year. Greater comforts and luxuries are supplied by rival roads, and the expenditures in this direction are directly noticeable in the increased patronage.

The "general housekeeper" of a great trunk railroad line is most frequently a man, and his business is to manage the stations, supplying them with all needful articles, and closely watching the waste to see how a saving can be effected. Under his bureau control there come numerous items of apparently small concern, but which in the aggregate amount to considerable sums. For instance, on the Santa Fé system last year, the "general housekeeper" purchased and distributed 26,000 brooms to keep the stations and offices of the company clean. Twenty thousand boxes of soap, 25,000 scrubbing brushes, and a similar number of hand-mops figured in the expenditures. The housekeepers of the individual stations and offices represent a formidable army. Upward of 10,000 of these were employed off and on last year by the Santa Fé road. At many of the small stations, the agent is his own housekeeper, ticket seller, telegrapher, and general freight agent; but at the larger stations scrubbers and cleaners are employed by the year.

The employés and officials of a big road must have pens, ink, paper, and even pins. Last year the pin item on the Santa Fé was no inconsiderable one. The total weight of the pins bought by the general housekeeper and distributed to the employes was 3,000 pounds. Forty thousand pens were also used, and fifty barrels of ink. There were enough lead pencils used to reach from Chicago to New York, and half way back again, if they were placed end to end.

An interesting question that comes up in every household is the disposition of the waste. The railroad housekeeper is careful to study out any economy, and the waste along the whole line is economically disposed of. Waste pins, pens, paper, old brooms, mops, bottles, and worn-out machinery of locomotives are gathered up along the route and sold for junk or "old scrap."

A small item, one would say, but a large one when considered in its true light. From waste paper alone last year the railroad above realized a profit of $5,000. Pens, shingles, and nails proved of important value. The total value of the "scrap heap" reached the enormous sum of $1,250,000. Of course the greater part of this waste came from the worn-out locomotives and cars which are sent to the scrap heap after they have ceased to be of further value to the company. But on the small household items mentioned, upward of $100,000 were realized. Everything is saved, and everything is economically disposed of. Even the ashes are sold or utilized for improving the roadbed.

The equipment of stations to-day with slot machines, literature, and restaurants has greatly increased the labors of the housekeeping department. In some instances the concessions are sold to private companies, but on some roads the rights to sell articles along the route are retained by the transportation company. On the Santa Fé route last year $11,500 were taken in the penny slot machines for chewing gum. This meant that a million and more pennies were dropped into the machines.

The supply of literature by the railroad company is enormous. Upward of five thousand train boys hawked the periodicals through the cars as licensed sellers, and half as many more sold books and magazines at the different stations. Several million dollars were taken in last year on the Santa Fé through this source. The distribution of literature over the whole route is a matter of exact business routine, which is managed entirely by a single head.

Candies, fruit, sandwiches, and similar edibles for the delectation of the travelers are important items. One trunk line annually sells over its route half a million pounds of candy, nearly twice as many sandwiches, and upward of 500 tons of fruit. This does not include what is sold in the waiting-rooms and restaurants of the stations. Here probably as much more of the sweet things are disposed of to hungry passengers.

A million bottles of soft drinks is the annual bill of one road, or rather the amount that thirsty passengers dispose of while waiting for trains. The restaurants on a large trunk line will use upward of fifty carloads of provisions in the course of a year. But these are distributed so generally and gradually that they never block the line of traffic.

The tendency of the public to eat, drink, and read while traveling is so steadily on the increase that more conveniences are being made to satisfy it in this direction. Traveling libraries have become features of the leading parlor cars, and patrons of the road can read their favorite authors or magazines without expense. The traveling café and dining car are as common to-day as the smoker or baggage. To supply these thousands of cars, with all the necessary provisions and articles of diet to suit the most fastidious, the general housekeeper in charge of this department buys in wholesale quantities all along the line. A single railroad system will use upward of 50,000 barrels of flour a year for the dining-car service, 40,000 pairs of poultry, 10,000 quarters of beef, and innumerable tons of fruits, pastry, coffee, and vegetables. To be at the head of such an extensive housekeeping department, a manager must buy economically, and dispose of the surplus and waste profitably. Fruits and vegetables out of season in the North in winter are generally purchased in the South and taken aboard the northbound trains at the most convenient point, and northern fruits and vegetables in summer are likewise shipped south in the same way. Thus all the delicacies of the country are used in and out of season at the lowest minimum of cost.

If we should add to the general housekeeping economics of a railroad the items which pertain more distinctly to the gardening or landscape department, we should find more interesting statistics. Every railroad has its landscape gardening department to-day, and tens of thousands of plants, trees, and shrubs are planted and cultivated every season. One eastern road puts out nearly a million bedding plants every season to decorate the grounds around the stations, and another raises cut flowers so that every office and important station is supplied with fresh-cut flowers every day through the summer season. Ten thousand cut flowers are weekly distributed for table decoration on the dining cars. It costs money to support this department, but the indirect results are apparent in the approval, and increased travel, of patrons.

The care of the linen of a single trunk line is a gigantic task. No hotel or series of hotels offers any