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THE ROWELL AUTOMATIC RAILWAY SAFETY STOP.

It is a well known fact that the majority of railroad accidents, those that cost the companies large amounts of money, are seldom reported in the papers, and these accidents, while not usually attended with loss of life, are a constant drain upon the railroads. One of the leading railroad men in New England recently told us that it was the accidents that the general public did not hear of that cost the companies so much money. The old saying that switches are the bane of a railroad man's life is exemplified in the following list of 70 railroad accidents that have happened within the last six months, compiled from newspaper accounts by a gentleman in Boston, which shows that open and misplaced switches are directly responsible for a large share of these accidents.

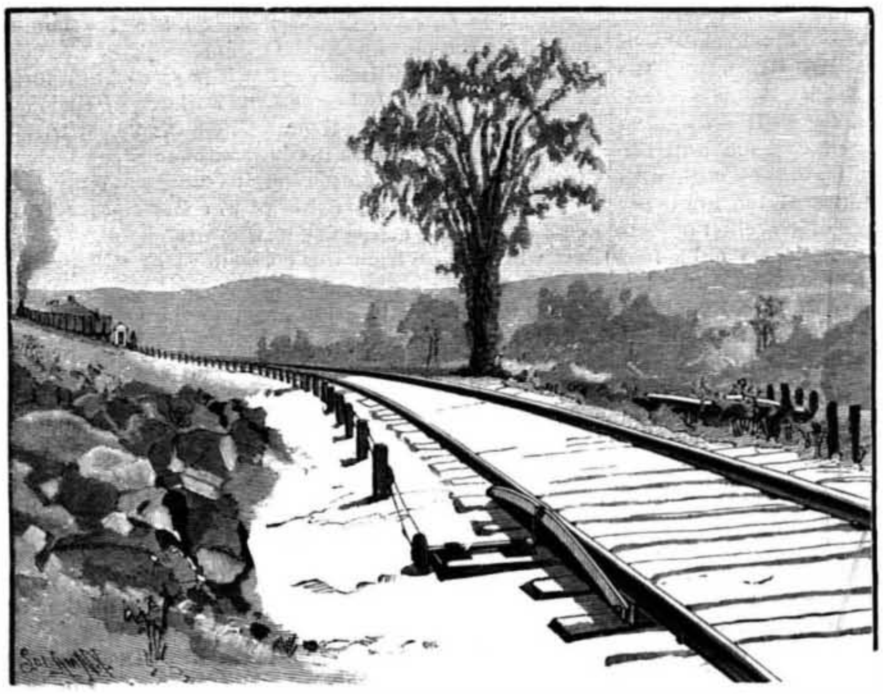

Fig. 3.—OPEN SWITCH—SAFETY STOP IN POSITION.

Misplaced and open switches	25
Collision of trains	17
Engine running "wild"	4
Fog, could not see signals	6
Snowstorm, could not see signals	1
Open drawbridge	3
"Wild" freight train	1
Not flagged in time	5
Unlocked switch	1
Engineer asleep	3
Paid no attention to signals, Mud Run	1
Drunken engineer	1
Switch tender asleep	1
Failure of brakes to work. (Caused by engineer throwing valve lever too far, thereby releasing brakes after applying them, which could not happen with this device)	1
	70

We had the pleasure of attending a thorough test made of the Rowell safety stop, given at Neponsett, Mass., on April 9. A special train of four cars was run from the Old Colony Depot in Boston, and quite a number of prominent railroad officials were among the guests. Several tests were made, all of which were successful, and conclusively showed that with the safety stop in position it was possible to stop a train running at the rate of 40 miles an hour in less than 500 feet.

In the first test the train was stopped in 380 feet, the engineer not shutting off the steam until the train had almost stopped. The second stop was made in 390 feet; and in the third test, made with all the party on board, the train was stopped within 370 feet, and the shock, though plainly felt, when the brakes were applied by the stop, did not inconvenience any one. All present pronounced it an unqualified success, and tests were also made with the portable form of safety stop, which enables the conductor to absolutely prevent his train from being run into from either direction.

The cuts which we publish in this connection show the applications of the safety stop in various conditions. Fig. 2 shows an open drawbridge. The opening of the draw places the safety stop in position, so it would be impossible for the engine to reach the bridge even if the engineer should be asleep at his post, disabled, or fail to see the signals usually displayed. Fig. 3 shows the manner of application when a switch is open or misplaced. These two illustrations show the safety stop placed permanently in position at what are considered danger points. In Fig. 1 we have an illustration of how this device works on roads where track walkers are constantly employed, and where many accidents happen because the signals are not seen, or, as has happened more than once, the storm has drowned the noise of the torpedoes. A track walker with this device does not have to walk more than 600 or 700 feet, and by placing one of these stops in position at each side of the landslide the place is unapproachable. This can also be applied to grade crossings, so that a train cannot cross the grade when the gates are up, raising and lowering the gates controlling the passage of trains.

Fig. 4 shows the invention attached to the locomotive. It is attached to both sides, and consists of a sliding bar located on the pilot of the engine, connected by a pipe with the power brake, in which is placed a valve directly at top of sliding bar. At the lower end of the sliding bar is placed a friction roller to relieve the blow. The sliding bar is 8 inches outside the rail, and the friction roller is 4 inches above the rail. Beside the track on the sleepers, the proper distance from the rail, 8 inches, to come in line with the sliding bar upon the engine, is an incline composed of two bars of iron, one-half inch by three inches, set edgeways, pivoted at the ends and jointed in the center, one side being slotted to allow it to be raised and lowered. Directly under the center or slotted end is placed a shaft or cam, so that by turning the shaft the bars of iron are raised four inches. At one end of the shaft is placed a wheel, around which a circuit of wire is run to the signal, so that when the signal is turned to danger the shaft is turned in the direction required to raise the incline, which is thus in position to connect with and

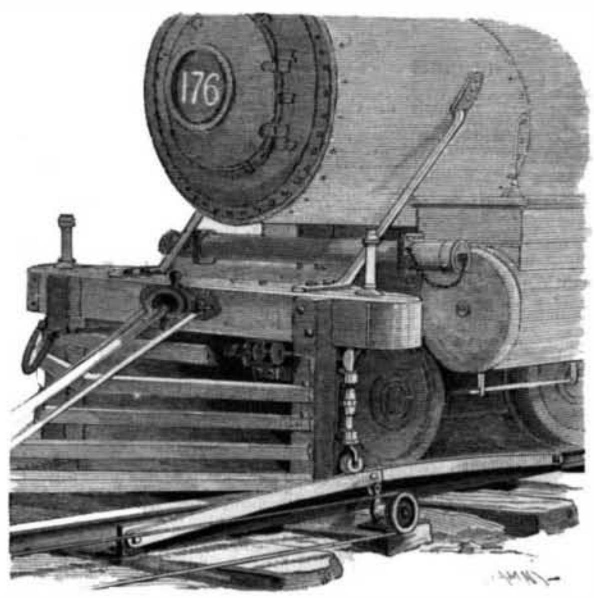

Fig. 4.—DETAILS OF ATTACHMENT TO LOCOMOTIVE, SHOWING MANNER OF STOPPING TRAIN.

force upward the sliding bar on the pilot of the locomotive, thereby opening the brake valve, which sets the air brake. When the signal is dropped to safety, the shaft is turned in the opposite direction, and

(Continued on page 294.)

Fig. 1.—LANDSLIDE—TRACKMAN PLACING PORTABLE SAFETY STOP IN POSITION.

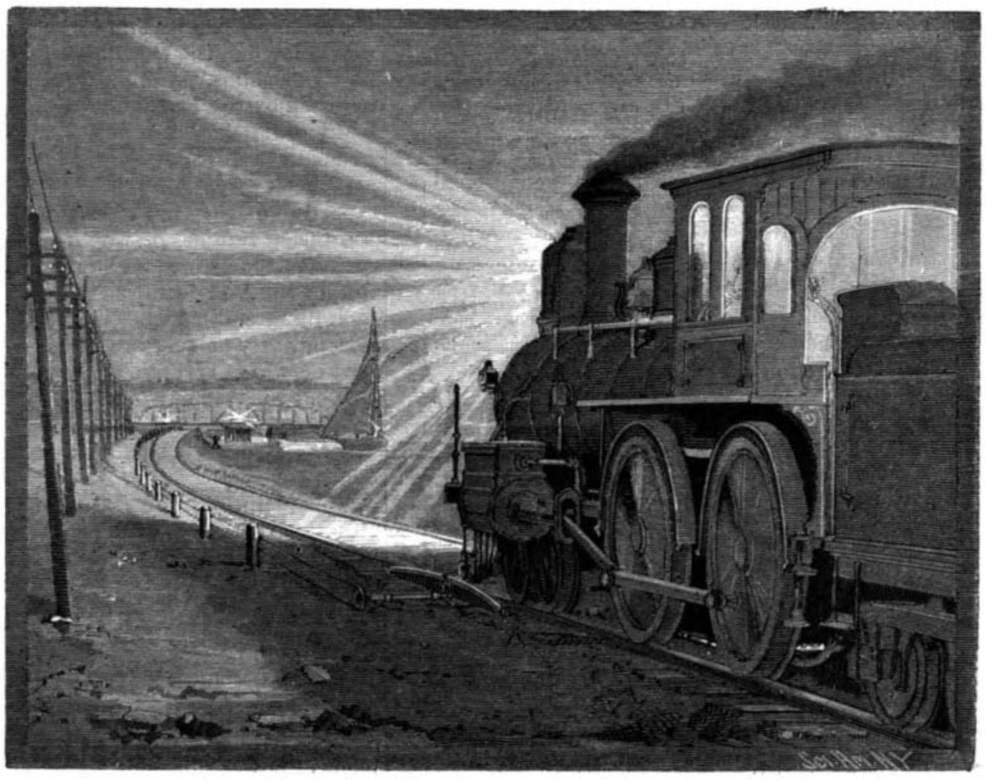

Fig. 2.—OPEN DRAWBRIDGE—SAFETY STOP HOLDING TRAIN.

ROWELL AUTOMATIC RAILWAY SAFETY STOP.

THE ROWELL AUTOMATIC RAILWAY SAFETY STOP.

(*Continued from first page.*)

brings the incline to the level with the top of the rail, thereby breaking connection with the locomotive.

In Fig. 5 we show the portable device. This is made of hard wood, four feet and four inches long, top edge being inclined both ways from the center, so that it cannot be placed in wrong position, and weighs less than ten pounds. Two steel clamps at the ends hold it the proper distance from the rail and steady it in position. The clamps are of steel, four inches wide and three-sixteenths of an inch at the thickest part, where they go over the rail, and beveled off to a knife edge each way, thus presenting no obstacle in the way of the passing car wheels. At the bottom edge of this board are small spikes, which are crowded into the sleepers and hold the board firmly from slipping. The effectiveness of this device does not depend upon the speed of the train. It stops the train without the aid or knowledge of the engineer, who can by this absolute protection maintain a high rate of speed on the darkest night when it is impossible to see the signals.

B. C. Rowell, the inventor, is an old railroad man, having been for many years brakeman and conductor, and thus has a practical knowledge of exactly what is of use in an emergency.

This safety stop, while absolute in the protection afforded, is comparatively inexpensive, certain in action, and easily applied. Its general adoption by the roads would greatly lessen the dangers of travel, and entirely do away with nine-tenths of the accidents that

Fig. 5.—PORTABLE SAFETY STOP IN POSITION.

are so costly to the companies. Full particulars can be had by any one interested by addressing the Rowell Automatic Railway Safety Stop Co., No. 620 Atlantic Avenue, Boston, Mass., of which Benj. S. Lovell is president and Irving B. Sayles treasurer.

The Largest Wooden Vessel Afloat.

The *Philadelphia Press*, reporting the arrival at that port recently of the wooden vessel Rappahannock, says she is the largest wooden vessel afloat. She was built at Bath, Maine, and cost $125.000. The vessel is 287 feet long, 48¾ feet beam, and her total tonnage is 3,053 net. In the construction of the ship 700 tons of Virginian oak and 1,200,000 feet of Virginian pine timber were used. The frame is oak, well seasoned when put up, and the first quality of Georgian pine was used in the ceiling, deck, frames, and planking. The main keelson is 3 feet 2 inches in depth; bilge keelsons, 14 inches flush; lower deck beams, 15 inches by 15 inches; between deck beams, 12 inches by 14 inches; upper deck beams, 12 inches by 14 inches; and the spar deck beams at the main hatchway are 18 inches by 18 inches. The decks are of yellow pine, and the quarter deck extends forward to the mainmast. The Rappahannock is the heaviest sparred ship that ever carried the stars and stripes. Her mainmast is 89 feet long and 38½ inches in diameter; the foremast is 88 feet long and 38 inches in diameter; the maintopmast, 58 feet; maintopgallant mast, 71 feet; main yard, 95 feet; fore yard, 95 feet; lower maintopsail yard, 87 feet; upper maintopsail yard, 87 feet; lower maintopgallant yard, 70 feet; upper maintopgallant yard, 64 feet; main royal yard, 53 feet; main skysail yard, 43 feet. The lower masts are of Georgian pine, and the other spars of Oregon pine. The ship has a steel bowsprit, which is an innovation. She has no jibboom. Her spread of canvas will be 15,000 yards.

A New Niagara Ship Canal.

The committee on railroads and canals of the House of Representatives has taken favorable action in relation to the bill for the construction by the government of a ship canal around Niagara Falls between Lake Erie and Lake Ontario. The route most favored is 21 miles long, and an appropriation of $10,000 for the arrangement of the preliminary details is included, together with $1,000,000 for beginning the actual work of construction. The proposed canal is to be 100 ft. wide at the bottom, with a minimum depth of 20 ft., its estimated cost being $23,000,000. The consideration of such an outlay is primarily its commercial value, but, in view of our present treaty provisions which allow the maintenance of but one gunboat by this government on the lakes, its value in event of a war with England is apparent.

Storage Battery Electrical Cars.

In this city the Fourth Avenue Street Railway Company is still running a few of its storage battery cars, but they have not yet attained that degree of success which is expected.

In Birmingham, England, a line of these cars is now under construction.

In Brussels the Tramways Company has decided to discontinue running the electric tramcars from the 1st of May next and to return to horse traction. The reason for this action is that the service of electric tramcars has caused a deficit of £1,144, and this sum forms the difference between the cost of electric and horse traction.

The company considers, after having had an experience of electric tramcars for four years, that that period has been sufficient to prove that whatever reductions may be made in the maintenance of the accumulators, and whatever the possible improvements in the mechanism of the motors, accumulator traction is not practically applicable to the company's system from a remunerative point of view, bearing in mind the particular conditions of the service. After referring to electric traction in other countries, the company concludes that from the experience at Brussels the most economical system of working tramcars is by animal traction.

La Gazette, in a long article on the subject, states that the adversaries of electric traction affirm that the cost per car kilometer is 4d., or 6½d. per car mile, while the advocates of the system maintain that the cost is only 2½d. per car kilometer, or 4d. per car mile. That journal then goes into figures, and endeavors to show that the cost per car mile in the two systems of traction, apart from the maintenance of the accumulators, is slightly less in the case of electric cars.

It must be remembered the cars have been worked under disadvantageous conditions. They are of small capacity, and the line traversed by them has some none too easy gradients. Moreover, although only three cars were provided, the station in the Rue Juste-Lipse was arranged with machinery sufficient for working eight cars, and this in itself was a disadvantage, since the general expenses of eight cars would be about the same as when only three were employed.

In Paris about six months ago the Northern Tramway Company commenced the running of four electric tramcars on the line from Levallois to La Madeleine. The cars are self-contained or accumulator cars, and were originally started as an experiment to see whether accumulators could be satisfactorily employed. The electrical energy is supplied by Faure-Sellon-Volckmar cells having twin plates. The number of cells in each car is 108, and they are placed in 12 boxes, each containing 9 cells in series. Each cell weighs 33 pounds, and the total weight of the battery is nearly 32½ cwt. The twelve boxes are placed in four lockers, situated at the angles of the car, four carried at the front and eight at the back of the car. The connections are so arranged that on putting the cells in place they are automatically grouped three in series, thus forming four groups of 27 cells each. These groups can for working purposes be coupled in four different ways. They can be arranged in parallel or in two groups parallel; three groups can be run in series, the fourth being in parallel with one of the three others, or the four may be connected in series. There is provided a fifth connection, which is obtained by means of an auxiliary commutator, which regulates the inequality of the discharge caused by the third method of coupling up. These connections are effected by means of a commutator in the shape of a wooden cylinder having contacts on its periphery. These contacts are connected to each other by inner pieces insulated from the metal axis of the cylinder. The positive and negative poles of the four groups correspond to eight fixed brushes. The cylinder is operated by means of a crank.

A Siemens motor, which is placed under the front of the car, runs normally at 1,000 revolutions, but a speed of 1,600 turns can be attained. The power is taken from the motor by an endless rope running over a set of gearing actuating the car, and which reduces the speed of the motor in the proportion of 26 to 1. The motor is reversed, and the car backed, by means of a special arrangement, comprising double V-shaped brushes. A single branch of the V of each brush touches the collector, but by causing the brushes to move by means of a lever the branches in contact are raised, and the other two are placed at 90°. Thus the direction of the current is reversed, and consequently that of the car. The weight of the car is 3½ tons, making, with accumulators, a total of 5 tons 2½ cwt. The cars each carry fifty passengers, and run normally at 6¾ miles an hour. At this speed on the level the power required is 4½ electrical H. P., on an incline of 1 per cent 8 H. P., on an incline of 2 per cent 11½ H.P. At 5½ miles an hour, on a gradient of 3 per cent, 12½ E. H. P. is required, and 15½ E. H. P. is necessary on a 4 per cent gradient. When running at 3 miles an hour on a gradient of 5 per cent, the E. H. P. is 10½. The French Electric Accumulator Company estimates that the cost of electric traction on the line in question amounts to 30 centimes per car kilometer, or about 4¾d., or a little less than 10 cents, per car mile.

Let the Government Help Everybody.

The effect of the special legislation and special bounty some of the silver men are asking from Congress is already becoming apparent. The agricultural classes, whose needs of public help are greater than those of any others, are putting forward their claims. Senator Vance has, at the request of the Farmers' Alliance, introduced a bill in Congress which calls for the erection in every county of the United States of a Federal warehouse, in which the owners of agricultural products may deposit the same and receive treasury notes for 80 or 85 per cent of the market value of these products, the notes to become part of the public currency.

Of course every advocate of the silver warehouse scheme will assert that the agricultural warehouse plan is preposterous, and not much better than the plan proposed some time ago by a Chicago paper, that the government purchase all the whisky manufactured, and issue therefor legal tender certificates, somewhat in the manner of the proposed silver certificates; and it is claimed for whisky that, as a basis of currency, it would have the unique advantage of increasing in value with age, thus earning its own interest, and after a certain number of years the government might sell a portion for the cost of the whole, and would thus make a handsome profit. Yet this proposition no doubt appears very absurd to nearly every one. The Farmers' Alliance consider its plan to have government warehouses a very serious one. Next we may reasonably expect the lead melters and the copper producers and iron furnaces to ask the government to indorse their warehouse certificates or to buy their products at some fictitious "market price."

When the government buys what every one produces, and pensions every individual in the nation with the taxes collected from every one, we shall have arrived at Bellamy's ideal state, and the government will, of course, then dictate what shall be produced and who shall produce it. We confess the Bellamy scheme seems to us to be a sensible and practical plan compared with some of the schemes proposed, and we are accustoming ourselves to "looking forward" to its adoption at an early date if the present craze for government help in every industry and by every individual continues. Before long we may expect every business to draw a bounty in some shape and every individual to get a pension.—*Eng. and Min. Jour.*

Possibilities of the Telephone.

Though the telephone has long since ceased to be a wonder, its great powers and adaptability to various purposes, as yet but hinted at, must still command attention, very much on account of their commercial aspect. This is evident on contemplating the work done by this instrument in the installation at the Lenox Lyceum, by which the "long distance" telephone company has placed before the public an exhibit of superb qualities. It seems strange, indeed, that up to the present time, the telephone companies have not done more toward exploiting a field which could certainly be made a source of considerable revenue by the furnishing of musical and other entertainments by wire at the fireside. But still more impressive than the musical part is the remarkable clearness of the long distance transmission. Although we are all accustomed to ordinary local telephone transmission, the mind can yet hardly grasp the reality of the enormous progress which permits persons hundreds of miles apart to maintain perfect oral intercourse. Yet we believe the time is not remote when even this will cease to attract even passing notice, and when the "long distance" lines, now mostly confined to the Eastern States, will cover the entire country with a vast network of "speaking wires." The "long distance" company is to be commended for the liberal policy adopted by it, in educating the public to the proper appreciation of the facilities available for it, and, if we are not mistaken, it will date one of its quickest and longest strides forward from the display at the Lenox.—*Electrical Engineer.*

Novel Fire Protection.

Seattle, Wash., has a rather novel scheme for utilizing its new fire boat as an aid to the land engines in cases where the burning buildings are too far from the water front to be reached by a stream directly from the boat. Briefly the plan is to provide four or five berths for the boat at different points on the harbor front, and from these points lay an auxiliary system of eight and six inch water mains through the business district of the place. These pipes it is proposed to connect with the hydrants, and through them the boat is to be made to force up salt water for the use of the engines in case of a failure of the fresh supply. The plan is a simple one, and there seems no reason, *Fire and Water* thinks, why it should not work satisfactorily. And why might not the same plan be advantageously adopted in New York and other Eastern cities? It is certainly worth considering.