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EDITORIAL ANNOUNCEMENTS.

CONTRIBUTIONS.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

ADVERTISEMENTS.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and these only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.

A stimulus to investigation and experiment for getting stronger track has been given by the Berlin-Zossen speed trials, where it has been shown that no ordinary rail joint or track can withstand the stresses made by motor cars at extraordinary speeds. It is a valuable lesson from the picturesque incident. The endurance of track is allied to it, but involves other considerations, those which are set forth generally in an article by Mr. Barschall in another column. The method by which he arrives at the conclusion that \$54,000,000 a year are lost on American railroads by the use of untreated ties, and joints which do not protect rail ends, can be easily overhauled and criticized, but it is quite unnecessary to do so. It makes little difference in the lesson whether the loss is half that sum or twice as much. It is a plain fact that there are two great unsolved engineering problems which concern economy and safety, and which should have all the more study and experiment because they are old and because the practice is far behind the accomplishments in other departments of railroading. Track work is a department of engineering in which theoretical improvements are peculiarly apt to fail—they are proved only when tried, and the trials must usually last through a series of years. We have all seen the best-designed joints and apparently the best planned methods go wrong under the time-test. Nevertheless, we are spending more than two billion dollars a year in maintenance of way in this country, and no one will deny that the cost of ties and joints is a large part of this great sum that is ill-spent. Only a few years ago, when a chief engineer asked his president for an allowance for a young bridge engineer's salary, he was rebuked by the statement that bridge work was the most highly scientific part and should be the concern of the head of the department; and the chief engineer answered that the maintenance cost more than \$3,000,000 a year, and he hoped by personal attention to either increase its efficiency or decrease its cost by 25 per cent., whereas a better bridge engineer than he ever hoped to be could be got for \$1,800 a year.

The derailment at Laurel Run, Penna., on December 23, is notable for its terrible results, for the insignificance of its cause and also that death came swiftly, without prolonged suffering, to the victims. There were few wounded. When the locomotive was derailed by timbers on its track, cast there from a passing freight, the leading passenger car was forced over the baggage car and tender and landed

on the engine, where its occupants were boiled by a steam blast from the boiler dome. There is no claim that the engineman was not keeping a good lookout; the engine was a new one and the cars were of approved construction. The fall of the timbers was due to faulty stakes or stake pockets or loading. The rarity of such defects and insecure loading, in comparison with the billions of chances for them, is evidence of the prevailing care in inspection at terminals and of the discipline and thoroughness of the work of car loaders at stations. Their work is subject to the scrutiny of car inspectors at every division terminal; and where a long journey may develop a combination of insecure loading and a defective car, a fault which did not exist at the start, this inspection is the most vital factor; but as other defects in cars have long made it necessary for superintendents to maintain the inspection at the highest possible efficiency, it can hardly be said that this case teaches any new lessons. It is not the results of an accident, it is the cause which should be studied. Two days before the Laurel Run disaster the following accident occurred:

A serious freight wreck occurred at Woodfern as the result of the shifting of iron bridge trusses loaded on a flat car. The beams slipped from their fastenings and swung crosswise of the car as the train was going around a sharp curve at a high rate of speed. A freight train running in the opposite direction crashed into the projecting trusses with a force that derailed and wrecked the engine and plied up 10 freight cars. The engineer and fireman of the wrecked freight had hairbreadth escapes, but were only slightly injured.

Memory is apt to be at fault in comparing the magnitude of a present disaster with those which have occurred before. It is well, therefore, to recall the most serious ones:

	Killed.	Injured.
1903—Laurel Run, Penna.	65	About 30
1901—Nyack, Mont.	31	..
1900—Tacoma, Wash. (electric car)	40	..
1900—McDonough, Ga.	41	..
1899—Stratford, Conn. (electric car)	29	..
1896—Atlantic City, N. J.	47	50
1895—Kobe, Japan	140	..
1889—Armagh, Ireland	80	282
1888—Mud Run, Penna.	66	..
1887—Chatsworth, Ill.	85	250
1881—Malpais, Mexico	214	50
1879—Tay Bridge, Scotland	73	None
1876—Ashtabula, Ohio	80	60
1864—Belleville, Canada	83	..
1864—Mast Hope, Penna.	60	120
1856—Camp Hill, Penna.	66	100
1842—Versailles, France	52	40

Only three days after Laurel Run came the butting collision at East Paris, Michigan, in which about 22 were killed and 29 injured. Its lesson is a plain one. The meeting point was ordered changed by the train dispatcher and the station agent at McCord's says that his signal lamp was blown out, and the engineman, not expecting an order at this station, ran his train on to destruction. This was human error, for the rule is that when the engineman does not find a light where there ought to be one, he must stop and find out what is the matter; and the duty to know at exactly what place he should find each light is the very first duty that is impressed on him when he learns the road. That light at McCord's should have shown either "stop" or "all-right;" if a light does not show go-ahead it must be taken to indicate "stop." To some railroad men this case will suggest a comparison between the despatching system and the block system. As an engineman made the mistake of passing a fixed stop-signal, would he not do the same under the block system; and therefore are not the usual arguments for the block system overdrawn? Enginemen have run past block signals, exactly like the train-order signal at McCord's, without heeding them. But the block system is far safer because it inculcates a methodical habit of minding and relying on signals which tell him absolutely whether or not he has a clear track. Under the despatching system the old habit persists, of going on unless stopped. Under the block system an engineman, after a few years, if not in a few months, learns to stop unless signaled to go on. This shifting of the burden of proof is one of the great values of the block system. It is not the whole argument, but it is the one that applies with force to a case like this.

Compulsory Block Signaling.

The Interstate Commerce Commission has submitted a draft of a law (printed in full in another column) designed to make it "unlawful to move any car or engine" on any passenger road engaged in interstate commerce, after January 1, 1903, unless under the block system. The Commission defines this system to be "the method whereby, by the use of

the telegraph, telephone, or electric bells, or by automatic apparatus, each train is prevented from leaving a certain point until the last preceding train has passed beyond a certain point farther on."

That the public interest is best served by wise governmental regulation of railroads is beyond question. Unrestricted operation and competition by 1,200 railroad operating organizations result in inequalities and injustice just as surely as unrestricted railroad building has resulted in calamity. The expediency of the proposed law, considering the present voluntary progress made in installing block signal systems, can be intelligently judged by a summing up of the results of like legislation in this country and in Great Britain.

The British law of August 30, 1889, authorized the Board of Trade to order the use of the block system and of the interlocking of switch points and signals; but 16 years before that time 39 per cent. of its mileage was already blocked, and in 1889, the year the law was passed, all of the double track lines in Scotland were worked by the block system; in England 98 per cent., and in Ireland 35 per cent. One year later the mileage of single track worked by the block system was about 90 per cent. of the whole. By 1898 substantially the whole of the passenger lines of the United Kingdom were block signaled and practically all switches and crossings were interlocked. The British block system was, and still is, purely manual, costly to maintain and always subject to human error; although on some congested lines the controlled manual is used.

In 1893 the Interstate Commerce Commission was empowered by law to compel the use of automatic couplers and power brakes on cars used in interstate commerce, but a year before this time 17 per cent. of all the freight cars in the country were equipped with automatic couplers, and 12 per cent. with air brakes. The provisions of the law of 1893 were to have gone into effect on Jan. 1, 1898. On that date the roads reporting to the American Railway Association had 61 per cent. of their cars equipped with automatic couplers and 41 per cent. with air brakes. Owing to the depression in business throughout the five years 1893-1898, the date for compliance was postponed by the Interstate Commerce Commission, in accordance with the provisions of the Act, and the requirements of the law finally went into effect in August, 1900. The statistics for that year show 93 per cent. of the freight cars equipped with couplers and 64 per cent. with air brakes. In regard to air brakes the law did not specifically require the equipment of any fixed number or proportion of cars, but required the use in every interstate train of enough power brakes to control the speed, hence 64 per cent. was a practical compliance with the Act. On July 1, 1903, the percentage of freight cars equipped with air brakes was 81.9.

It is a grave question whether the constitutional grant to Congress, "to regulate commerce . . . among the several States," gives a right to make it unlawful to move a passenger train anywhere on a line between Chicago and Omaha unless it is at each step "prevented from leaving a certain point until the last preceding train has passed beyond a certain point farther on." The courts have already interpreted this clause as giving to Congress the right to prescribe rules for the equipment of cars crossing State lines with appliances for safety and interchangeability. Mature people easily recall their surprise when, only a few years ago, this deduction was made from a clause in the constitution primarily designed to prevent the exaction of duties at State lines. Not many years before that the State of New Jersey was taxing passengers between New York and Philadelphia one dollar each, and no one seems to have thought of the power given to Congress to prevent such a "restraint of trade."

The control by the general government of methods of transportation within a State has never before been attempted, and this prescription of definite rules for installations and operations, wholly within a State, if found to be lawful, will have other results which seem to be logical. It may be found to be a restraint of trade to move passengers at other than high speed on roads crossing State lines. The motive power to be used, the safety of bridges and track, may likewise be made subject to general government supervision. Nevertheless, this need not be at all alarming. The tendency of court interpretations of general authority conferred by the constitution of the United States and the several States has always been toward the broadening of those interpretations—to their specific application to every case which the words used may fairly cover. It may reasonably be expected—with some doubt—that if this bill becomes a law it will be upheld. The doubt is

rather whether or not the members of Congress may consider such a law an infringement on State rights.

But is this law designed to promote the public welfare? In the history of railroading no public enactment has ever pointed the way. Betterments have invariably been found, perfected and applied by the men whose business it is to make transportation, and it happens that the function of the lawmaker has never been advantageously applied to compulsory use until after the substantial perfection and long continued voluntary use of the devices for betterment. Mr. Westinghouse needed nearly twenty years to fully develop the quick-acting automatic air brake, the only discovered means of controlling long freight trains at high speeds. In its earlier forms it was applied without compulsion to most passenger trains. From 1888, when it was so improved as to be usable on long freight trains, its application was voluntarily made with wonderful rapidity. The safety appliance law was, later, of use only in enforcing action by a minority of recalcitrants.

Block signaling is of two kinds, safe and much less safe. No system is fully safe without a track circuit, which is somewhat difficult to satisfactorily apply to single track roads, and the first cost of which is not justified on lines of very thin traffic. Nevertheless, it has been installed and is working well on many hundred miles of busy single-track lines. It is believed to be desirable both for reasons of safety and of economical increase of capacity on most double-track roads. It has been for years a progressive art, and its latest developments have been put in service quite as fast as they should be. The criticism is, rather, that of too great eagerness to put in service untried devices.

The sum of it is that automatic block signals are now available for getting a greater measure of safety, a greater capacity (in that they make it practicable to run more trains safely) and a lower cost of operation than the manual system; and the railroads are showing a disposition to install and use them as fast as possible.

President Mellen, of the New York, New Haven & Hartford Railroad Company, has, we understand, been looking carefully into the marine department of his corporation with a view to future economies and possible changes in the operation of that important branch of the company's service. The fact suggests that the great boat traffic of Long Island Sound, now almost monopolized by the New Haven railroad company, has been fiscally almost a sealed book to stockholders as well as the public. The corporation owns or controls six important boat lines between New York city and Bridgeport, New Haven, New London (and Norwich), Stonington, Providence and Fall River. It has a great fleet of large Sound boats, very valuable wharf properties and gross receipts from traffic running probably well up into the millions—saying nothing of transfer floating stock in New York waters which includes four steamers, 15 tugs and 41 car floats. Yet practically the only references in annual reports to the great Sound traffic of the corporation have been, for example, such curt allusion as appears in the last report where it is stated that "The earnings of steamboat lines are not included in the foregoing figures (the general statement) except that the dividends received from the lines are included in the item 'Income from other sources'" (\$505,817). The marine department is an integral and very large factor in the New Haven system, and if President Mellen in his first report next autumn sees his way clear to letting in light upon the old *arcana* it will be a subject in which the general public as well as his shareholders will take much interest. In this connection it may be recalled that, on motion of a stockholder, President S. D. Babcock, of the old New York, Providence & Boston Railroad, made the returns of the controlled Stonington steamboat line a separate part of the annual railroad statement, where it figured, if we are not mistaken, until both were absorbed by the New Haven system.

The Supreme Court of the United States, in a decision by Justice Day, has upheld the rule of the Courts of the State of Pennsylvania which forbids a common carrier to limit its liability for damages due to negligence; and the fact that a shipment is interstate does not alter the application of this rule. The decision, which was in a suit brought by Hughes & Fleming against the Pennsylvania Railroad, and was handed down December 7, appears to be little more than a restatement of opinions by the Supreme Court in an Iowa case, *Chicago, Milwaukee & St. Paul vs. Solan* (169 U. S. 133); the difference between Iowa and Pennsylvania being that Iowa enacted a statute, while in Pennsylvania the rule was enunciated by the Courts, there being no statute on the subject. Hughes & Fleming had a horse shipped from Albany, N. Y., to Cynwyd, Pa., and the animal was injured by negligence in switching, in a Pennsylvania yard, at Philadelphia. In the bill of lading the liability of the carrier was limited to \$100, in consideration of a low rate. The law of the State of New York permits this kind of contract, and the same rule is recognized in the Courts of the United States; but in Pennsylvania,

although there is no statute prohibiting agreed valuations, the Courts hold that such agreements are contrary to public policy. The owners of the horse claimed that the action of the Pennsylvania Courts was contrary to the Interstate Commerce Law, and on that plea they got the case before the Supreme Court. The decision quotes a number of earlier decisions sustaining the view that a State may, under the Federal Constitution, require a common carrier, although in the execution of a contract for interstate carriage, to use great care and diligence, and be liable for the whole loss resulting from neglect to use such care and diligence; and the principle is the same whether the State exerts this control by means of a statute or by the rulings of its Courts.

The Erie Railroad has doubled the capacity of its line leading to the terminal at Jersey City, for one hour each morning, by a stroke of the pen; that is, by ordering the use of both of the two main tracks for eastbound trains. This line, the approach to the company's New York terminal, accommodating the trains of the main line, the Newark branch, the Northern Railroad of New Jersey, the New Jersey & New York, and the New York & Greenwood Lake, has long been congested morning and evening because of the limitations of the tunnel. The construction of additional tracks would be very costly and the dividing of the tunnel into two block signal sections is objectionable. The difficulties have been somewhat mitigated by coupling two short passenger trains together and running them through the tunnel as one train, but the benefits from this arrangement are quite limited. Under the new arrangement there will be no westbound trains at all between 8 and 9 a.m. Trains which formerly left shortly before 8 will go later; and five local trains have been taken off or consolidated with others. On the last train going west before 8 o'clock, which is No. 21, leaving the terminal at 7.47 a.m., a train despatcher rides from Jersey City to the station at the west end of the tunnel; and during the hour that trains are detoured this officer gives a hand signal to each engine man who is to run on the left-hand track. The length of the line is about two miles. This hand signal is in addition to the usual fixed signals. In the order putting the regulation into effect the despatcher is named, and the hand signal must not be taken from any other person. In case of his disability, the superintendent will make suitable announcement of the name of the substitute.

On the Chicago & Alton all of the coal used by the locomotives is now weighed out to each individual engine. Measurements, as substitutes for scale weights, have been done away with, and the records of coal delivered to tenders are now kept with such accuracy that these figures alone are used to check the weights given by the mines, obviating the necessity of weighing the cars on the road. At all of the principal coaling stations, coal conveyors and scales are provided so that this work is, of course, easy; and at other places, such as the termini of branches on which but few trains are run, and where the coal is delivered directly to the tenders from the cars which bring it from the mines, the desired precision is secured by the use of cars fitted with partitions. Thus at a station where only two engines come to get their supplies, the coal is sent from the mine in a car having a partition in the middle, and, as a given engine uses all of the coal in a given section of a car, the need of weighing each tender-full is obviated. An officer of the road informs us that this method of keeping the records has proved highly satisfactory. It is found that enginemen and firemen, knowing that the charges against them for fuel are made with precision, take better care to show economical use of the coal.

NEW PUBLICATIONS.

History of American Steam Navigation. By John H. Morrison. 1903. Published by W. F. Sametz & Co., New York. 637 pages, 6 x 9 in., cloth. Price \$4, postage 25 cents extra.

Mr. Morrison's book is the most nearly unique history of American steam navigation which has ever been published, not only on account of the careful and accurate knowledge which it contains, but also because of the personal style in which it is written. The book has been 20 years in preparation and the author has collected a surprising mass of data in regard to his subject, going into the most minute detail and printing many of his documentary sources of information in full. The book might be called gossipy in that it gives the reader a kind of personal acquaintance with the steamboats of the '60s, the '50s, the '40s and the '30s, as if he himself had stood on the pier head and seen them go up and down the stream on their regular runs. All American commercial steam navigation is covered, classified primarily with respect to the geographical field; as, for example, the Hudson River, Long Island Sound, or the coastwise service; but also by cities. Thus, within the general Long Island Sound classification a complete record is given of all the passenger steamboats which have ever run between New York and New Haven, between New York and Norwich, Fall River, etc. The book is exceedingly graphic for the reason that the author does not spare space when he has interesting matter to tell, and we read of the burning of the "Lexington" on Long Island Sound in 1840 at mid-winter with as much excitement as if it were in our morning paper. There is a full and complete history of

each of the Sound lines, not only those at present in operation but those which have died out, and the little circumstantial incidents about hulls, boilers and captains, so often omitted as unimportant in a history work, make the book quite charming to those interested in the subject. Chapter 4, containing about 50 of the large pages, is devoted to the western rivers and is one of the most fascinating parts of the book. The hopelessly reckless way in which the boats were built and run stands out graphically on every page. For example, quoting from a passage in the book where David Stevenson, in 1838, is writing of his experiences in making a landing on the Mississippi: "She (the steamer 'Ontario') was sheered close in shore amongst stones and stumps of trees, where she lay for some hours taking in goods. The additional weight increased her draft of water and caused her to heel a great deal, and when her engines were put in motion she actually crawled into deep water on her paddle wheels. The steam had been got up to an enormous pressure to enable her to get off and the volumes of steam discharged from the escapement pipe at every half stroke of the piston made a sharp sound almost like the discharge of firearms, while every timber in the vessel seemed to tremble and the whole structure actually groaned under the shocks." The writer evidently was greatly interested in the racing which used to play such an important part in water transportation, and there are many thrilling episodes related with the fullness of circumstance and vividness of picture that one would get from a group of sea-faring men who had been on the scene. Many errors of previous historians are corrected with a mass of evidence, and but little regard has been paid to the traditions of historians who have previously written on the subject. Mr. Morrison was with Samuel Secor, a marine engineer of Washington street, New York, during the early '60s, and with C. W. Copeland, marine engineer, New York, from 1873 to about 1890; so he writes of the steamboats which plied in eastern waters as of old friends, and his book is cordially recommended to those who are interested as by far the most complete and interesting document of its kind that we have seen.

TRADE CATALOGUES.

Gas for Furnace Work is the title of a small pamphlet published by the Power & Mining Machinery Co., New York, in which are given some interesting data on the comparative cost of operating oil and gas fired furnaces for annealing, forging, welding and melting. The figures are taken from plants in actual operation; the cost of producer gas as fired being calculated on the performance of Loomis-Petibone gas producers which are made by this company. Bituminous or anthracite coal, coke or wood can be burned without any modification of the apparatus and a clean fixed gas is produced which can be conveyed any desired distance in cast or wrought-iron pipes. The Power & Mining Machinery Co. also makes the Crossley gas engines in sizes from 150 h.p. to 650 h.p.

"Continental" Boilers with Morison corrugated furnaces is the subject of Ryerson's new technical library, sixth edition, No. 4, issued by Joseph T. Ryerson & Son, Chicago. This type of furnace together with typical installations are described in detail. A chapter on "The True Tale Tensely Told" gives interesting comparisons between horizontal tubular and internally fired boilers. A test of a Morison corrugated furnace boiler at the Central Park Avenue station of the Chicago Water Works showed that the equivalent evaporation per pound of coal was 12.44 lbs.

Westinghouse Electric & Mfg. Co., Pittsburg, Pa., has issued two revised circulars dated December, 1903, and superseding previous publications on the same subjects. Circular No. 1,032 describes the No. 56 railroad motor, made by this company, which is suitable for city and suburban cars. These machines have a rated capacity of 55 h.p. Electric Motor-Vehicle Equipments is the title of the other circular, which is numbered No. 1,059. The equipment supplied for one vehicle includes the motors, controlling devices and wiring but does not include the storage batteries.

The Keystone Driller Company, Beaver Falls, Pa., has sent us catalogues Nos. 1 and 2 together with illustrated circulars containing testimonials from users of their machines. Catalogue No. 1 has 88 pages devoted to portable drilling machines and accessories. It also contains valuable suggestions on the handling of drilling outfits. Catalogue No. 2 is entitled "Mineral Prospecting Machines," and shows the adaptations of the drilling outfits to prospecting.

The American Brake-Shoe & Foundry Company, Mahwah, N. J., has issued catalogue No. 2, which gives illustrations and prices of engineer's wrenches, "S" car wrenches, track wrenches, coal picks, car repair hammers, and machinists' hammers. These cast steel tools are made by the Tropenas converter process.

The January number of *Graphite*, published by the Joseph Dixon Crucible Co., Jersey City, N. J., contains the usual series of miscellaneous amusing anecdotes, judiciously interspersed with stories which point a moral.