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NEW YORK, SATURDAY, JUNE 22, 1907.

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.

HOW THE LAW MAY PREVENT RAILROAD ACCIDENTS.

The president of one of our leading railroads, who has risen to his present position by steady advancement from the ranks, recently told the writer that in a last analysis of the causes of railroad accidents he was convinced, as the result of his long experience, that it was to be found in the lack of discipline; the disposition to play fast and loose with established rules. In proof of this, he cited the fact that as the result of a journey which he had recently taken through Europe, during which he investigated the signal systems on several of the roads which have shown a remarkable immunity from accident, he was surprised to find in how many cases these systems were inferior to those which were installed on some of the leading American railroads, including his own. And yet, in spite of superior protective appliances, the list of casualties was much larger on our roads in proportion to the number of passengers carried. The question of the enforcement of discipline by the strict imposition of penalties was rendered difficult, according to this authority, by the action of the various labor associations which, in their zeal to protect employees (a zeal perfectly proper when exercised with due discretion), too often demanded the reinstatement of those who had been proved guilty of flagrant disobedience to established rules. Moreover, it would happen, in cases in which the management was prepared to fight out a contested case on a point of principle, that an intimation would be quietly conveyed from Wall Street, to the effect that under no conditions was a strike to be precipitated, at least for the time being.

Without entering into the merits of the case as thus presented, it is certain that such a condition of things is full of frightful menace to the safety of the traveling public; and the question may well be asked, whether some higher power may not be invoked to deal with the situation. Such an opportunity is, of course, presented when accidents involving the death and injury of the passengers or employees occur; and a case has recently been brought to our notice in which the criminal negligence of an employee was visited with immediate and severe punishment, and steps were taken to prosecute the company for operating their railroad under laws which, by rendering such an accident possible, were a constant menace to the safety of the public.

The case in question was a head-on collision which occurred last year on the Grand Trunk Railroad. The coroner's jury found the engineer and the conductor of the train, who had overlooked the train with which it had collided, responsible for the accident, and in the subsequent trial the defendants were charged with the death of the employees who were killed, and also with violating the rules of the company. The jury found them guilty on the second count. The judge threw aside the plea that the conductor had worked overtime, and sentenced him to three years' imprisonment. In imposing sentence he said that, if the accident were the fault of the rules and regulations of the railway company, then terrible was the guilt of those responsible for such rules and regulations. "Much of the slaughter, however," said the judge, "is due to the sheer neglect and downright and inexcusable carelessness of those who are intrusted with the carrying out of these rules and regulations; and if you and your fellow trainmen had used even ordinary care, the three men now lying in the grave as the result of your act might now be happy and useful citizens." It was shown that the conductor had been working from nineteen to twenty hours a day; for which he received about forty dollars a week; but that these long hours of work were optional, and that he was entitled, under the rules, to a rest of eight hours.

Referring, on the other hand, to the responsibility of the railroad company, the judge said: "To my

mind, the persons who even permitted you to work from nineteen to twenty hours a day, day after day, five days of the week, were guilty of a gross wrong; the persons who made the rules and regulations under which this was possible are themselves almost as guilty, morally, perhaps legally, as yourself in the death of these three victims. I shall cause to be sent to the Crown authorities a copy of the proceedings of this trial, with the recommendation that all proper investigations be made, and that the persons responsible, no matter what their position may be, be proceeded against so far as the criminal law permits."

Although the penalty inflicted in the present case may seem to have been severe, it cannot be denied that one of the most effective "safety appliances" for the prevention of the unnecessary and shocking list of railroad fatalities and casualties, could be found in the swift and impartial action of the law, in every case where the death or injury of passengers or employees can be shown to be the result of faulty regulations on the part of the companies, or of inexcusable carelessness on the part of the employees.

WE BUILD A LOCOMOTIVE ON THE METRIC SYSTEM.

The opponents of the introduction of the metric system into America have asserted that its use would involve endless confusion in our mills, machine shops, and other industrial establishments in which the operatives have been accustomed all their lives to the use of the English measurements. It has been claimed that the change would so thoroughly disorganize the working forces, that it would involve many months of time, and a great loss of money, to get any establishments that made the change into the full swing of the new conditions.

The Baldwin Locomotive Works, however, has proved that in this case, at least, "an ounce of fact is worth a ton of theory"; for they have recently completed twenty locomotives for the Paris-Orleans Railway of France, which were built entirely from drawings made on the metric system and furnished by the railway company themselves. Of course, this is not the first time that work has been done in this country under the metric system of measurement and computation; but the successful execution of such a large order must certainly be regarded as a strong indorsement of the system as tried under American shop conditions. We are informed that not only have the locomotives fulfilled strictly the requirements of the specifications, but that the officers of the company were favorably impressed with the working of the new system.

BRUNEL AND THE SEVEN-FOOT GAGE.

When that far-sighted engineer Brunel built the Great Western Railway in England with a gage of seven feet, he aroused a storm of opposition among his brother engineers, the great George Stephenson being one of his most active opponents. Stephenson, for no better reason, apparently, than that it was the established English wagon gage, adopted 4 feet 8½ inches as the distance between the inside edges of the rails of his "narrow gage" railroads. Brunel, on the other hand, possessed as he was of what almost might be called a prophetic instinct, built for the future, whether he was engaged on the problem of transportation by sea or by land. His "Great Eastern" steamship was not exceeded in dimensions until the advent a few years ago of the White Star liner "Oceanic," and his 7-foot gage on the Great Western Railway maintained itself for half a century, giving most excellent results, in spite of the fact that the "battle of the gages" had been won by Stephenson with his narrow-gage roads, almost at the very outset.

The vindication of Brunel's foresight has been complete. If we take half a dozen of the latest of the transatlantic liners, we find that they are approximately of the same size, if not larger than, the "Great Eastern," while it was only the other day that the most prominent railroad magnate in this country stated publicly that the 4 foot 8½ inch gage was too narrow for present requirements, and that a broad gage of 6 or 7 feet must ultimately be adopted. This statement was prompted by consideration of the fact that many of the main lines of this country are heavily congested, and are unable to handle promptly the enormous and ever-increasing amount of freight that is delivered to them.

It is a fact that, were it not for the enormous expense which would be entailed in the widening of the gage of our leading roads, seven feet would be an immediate solution of the difficulty of congestion; for with the wider gage it would be possible, without making any increase in the number of train movements, to increase the carrying capacity of the roads fully fifty per cent. It is the narrowness of the present gage which limits the size and power of the locomotive; for the dimensions of boiler and cylinders have been increased until they have reached the limits of the height and width of tunnels and bridges. With an increase of width of gage of fifty per cent, and a corresponding

increase in the allowable height of locomotives and cars, it would be possible to build locomotives of more than double the power of the largest at present in use. This change, however, would involve the rebuilding of every tunnel, viaduct, bridge, and station platform throughout the whole length of the line so changed. Moreover, the enormous increase in the axle loads would necessitate the construction of an entirely different type of track from that which is now used—which, by the way, would be "a consummation devoutly to be wished." The present cross-tie, tee-rail, and spike method of track building is pitifully inadequate, even for present conditions; and if a 7-foot gage were used, some new form of track, with continuous longitudinal girders and heavy rail sections, would have to be built. In this connection it is interesting to note that Brunel adopted a longitudinally-supported track for his Great Western road. Though the change may not come in the present generation, the day is undoubtedly approaching when the engineers of the future will widen the gage, being driven to it by the stress of stern necessity.

ANOTHER LONG-DISTANCE TRANSMISSION IN CALIFORNIA.

The State of California has won another recognition of the enterprise which she has shown in overcoming the difficulty of the scarcity and high cost of fuel by utilizing the energy which is stored in the waters of the far-distant Sierra Nevada Mountains. At the beginning of the present century, as shown by the United States Census, she led the world in the number and daring of her long-distance hydro-electric transmissions. Notable among these is the plant by which, for several years, San Francisco has been supplied with electric power transmitted from water sources situated over 200 miles away from the city.

The most recent addition to these systems consists of the transmission of 25,000 horse-power for a distance of 117 miles, from the Kern River to the city of Los Angeles, at the extremely high pressure of 85,000 volts. This is the first installment of a total transmission of 60,000 horse-power, which is ultimately to be developed from that river and transmitted to Los Angeles. The water is deflected from the river and carried through the mountains and hills for a distance of 82-3 miles by means of twenty concrete-lined tunnels. It is then conducted down the slope of the mountain, through a total fall of 877 feet, to the power house, where, at a pressure of 400 pounds to the square inch, its energy is developed on eight impulse wheels, which serve to drive the generators. It is stated by the local president of the Edison Electric Company, which is carrying on the work, that there is no other community in the country in which the consumption of electricity per capita is so high as in Los Angeles, and that, with the exception of certain districts in the natural gas belt of the Middle West, there is no locality where the rates for power are cheaper. As showing the economy which is rendered possible by the great fall available in these mountain power plants, it may be mentioned that the conduit for conveying the water measures only 9 feet in height by 8 feet in breadth, and that the maximum interior diameter of the concrete-incased steel tube from the tunnel to the power station below is only seven and a half feet.

TINOL.

A new method of soldering has been brought out by a German company at Bonn which is claimed to be much superior to the present way of soldering with tin. Seeing that the quality of the joint depends largely upon the way in which the surfaces have been cleaned, great care must be given to this operation, and this is not always easy in the case of complicated pieces. Cleaning is usually done by acids, zinc chloride, sal ammoniac, etc., which have an acid reaction and leave traces of oxidation after the soldering. This may be a disadvantage, and in fact for electrical work the method of soldering by rosin must be used in many cases, in spite of the drawbacks which it has. As to the new solder, it is in the form of a paste which is more or less consistent, according to the needs. It contains the cleaning substance in itself and the soldering can be done without any previous cleaning. The paste is spread upon the metal surfaces and these are heated with the iron or by a lamp or furnace. For small pieces a candle flame is even enough. The substance is composed of lead and tin in fine powder, which is obtained by a patented process. A stream of metal coming from a nozzle is pulverized by compressed air or steam. The powder is then mixed with chloride of zinc or other similar reducing substances which are made fluid by adding glycerine, vaseline, etc. Consistence is given the paste by using cellulose, which burns without residue. These components are chosen so that when the paste is heated the metal melts first and appears as liquid drops in the midst of the medium and the latter is not altered, also protecting the metal from oxidation. Then these bodies decompose in turn, cleaning the metal and al-

lowing the solder to assemble and run upon the cleaned and protected surfaces. There is no acid reaction and the joint is very clean. It is somewhat dearer than the ordinary solder, but there is an economy in heating and in the use of the paste, as it avoids drops of solder. Proportions varying from 20 to 100 per cent of tin are used. One variety flows easily and can be put on with a brush, while the other kind is more solid. A good application is for fixing nuts upon bolts. Some of the compound is brushed into the thread, the nut screwed on and then heated when in place. Bolts of 0.4 inch diameter thus soldered could be broken by twisting before the nut could be unscrewed. Heating again will release the nut from the bolt. Tests show the mechanical and electric resistance to be in favor of the new method. The prepared substance is known as "tinol."

A TELEPHONE NEWSPAPER.

BY W. G. FITZ-GERALD.

If the dreamy, ease-loving Lotophagi of Homer ever had a newspaper, it was surely on the lines of Budapest's "Telefon-Hirmondo," or "Caller of the News." For here we have a "newspaper" with only an abstract existence; its soul poured into the listener's ear as he sits half dozing in a big armchair by the fire on weekday or Sunday.

Far from being the fad of a moment, the "Telefon-Hirmondo" has all the attributes of a great daily journal save mere concrete type, ink, and paper. It has a staff of over two hundred people in the busy winter months, and its circulation falls only when the editor-in-chief or his "stentors" slack off a little in their ceaseless stream of eloquence, wherein are queerly mingled events fraught with the rise or fall of nations and "ads" of soap and pills!

Its inventor was the Hungarian electrician, Theodore Puskas, an ex-collaborator with Edison. Mr. Puskas died three months after the practical realization of what had been his life's dream. He saw his beloved "News Teller" cautiously installed with 43 miles of wire; now it has 1,100 miles, forming a veritable web, pulsing with the world's doings and radiating into more than 15,000 of the best homes in the Hungarian capital.

Readers of Bellamy's "Looking Backward" will remember one of his boldest conceptions was a speaking, singing, lecturing, educating, and concert-giving "newspaper." I think it will come as a surprise to most people to hear that this fantasy has been in active operation in Budapest for a long time as a proved success, placing the famous and lively city of 800,000 ahead of the world.

From eight in the morning till ten at night eight loud-voiced "stentors" with clear vibrating voices literally preach the editor-in-chief's "copy" between a pair of monstrous microphones, whose huge receivers are facing each other. The news is of all kinds—telegrams from foreign countries; theatrical critiques; parliamentary and exchange reports; political speeches; police and law court proceedings; the state of the city markets; excerpts from the local and Viennese press; weather forecasts—and advertisements.

But the "Telefon-Hirmondo" goes far beyond the routine of an ordinary newspaper, as its remarkable constitution enables it to do. At stated hours concerts, performances at the Imperial Opera or municipal theaters are heard by subscribers in their own dining rooms, or as they sit by the fire playing cards on a winter's evening. Eminent divines, lecturers, and actors preach, address, or tell stories to enormous audiences scattered all over the beautiful city.

Subscribers even hear a list of strangers' arrivals, with the correct astronomical time and an exhaustive list of amusements such as may well tempt them from their own hearth. The exact time of each news item is strictly regulated and announced to subscribers every morning. Thus each need only listen to the news that interests him, and he can always be sure of its being "on tap" at the moment predicted.

In the event of some ultra-important item coming to hand suddenly—a disaster of international moment, an outbreak of war, or the like—it is instantly shouted into the microphones by the stentors, and special alarm signals ring in every household. When I called upon the editor at the administrative offices of the "Telefon-Hirmondo," I took careful note of a typical day's programme, and here it is:

A. M.

- 9:00— ..Exact astronomical time.
- 9:30—10:00..Reading of programme of Vienna and foreign news and of chief contents of the official press.
- 10:00—10:30..Local exchange quotations.
- 10:30—11:00..Chief contents of local daily press.
- 11:00—11:15..General news and finance.
- 11:15—11:30—Local, theatrical, and sporting news.
- 11:30—11:45..Vienna exchange news.
- 11:45—12:00..Parliamentary, provincial, and foreign news.
- 12:00 noon ..Exact astronomical time.

P. M.

- 12:00—12:30..Latest general news, parliamentary, court, political, and military.
- 12:30— 1:00..Midday exchange quotations.
- 1:00— 2:00..Repetition of the half-day's most interesting news.
- 2:00— 2:30..Foreign telegrams and latest general news.
- 2:30— 3:00..Parliamentary and local news.
- 3:00— 3:15..Latest exchange reports.
- 3:15— 4:00..Weather, parliamentary, legal, theatrical, fashion and sporting news.
- 4:00— 4:30..Latest exchange reports and general news.
- 4:30— 6:30..Regimental bands.
- 7:00— 8:15..Opera.
- 8:15 (or after the first act of the opera)..Exchange news from New York, Frankfurt, Paris, Berlin, London, and other business centers.
- 8:30— 9:30..Opera.

And once a week special lectures or concerts are given for the children. For a very different class of "reader," or rather listener, are reports of all the principal Hungarian and Austrian horse races, flashed over the wires the moment results are known.

The "Telefon-Hirmondo" has proved a real boon to this great city. For one thing it gives news of great importance far sooner than any printed daily can put it before the public. It is the delight of women and children, and is a real entertainment to the sick in their homes, to patients in hospitals, the blind, and all those who have neither time nor money to go to theater, concert, or opera.

And the most unique journal in the world is invariably "turned on" in the doctor's waiting room, in barber shops, cafés, restaurants, and dentists' parlors—wherever people resort, in fact, and sit waiting for any purpose whatever. And obviously, since the journal costs little to produce, its service is quite extraordinarily cheap. Each subscriber pays but two cents a day for receiving, as it were, orally in his own home, the news of the entire world, besides entertainment which might very well cost him several dollars a day.

No fees are charged for fitting up the receivers in a house; and should a subscriber wish the "paper" discontinued, he can ring off, as it were, after a four months' trial. Each station is provided with a receiver having two ear tubes, so that husband and wife, brother and sister, or a couple of children can listen at the same time. And the apparatus can be fixed wherever the subscriber wishes—at bed or sofa, writing desk, fireside, or study.

No more interesting experience can be imagined than a visit to the editorial offices, where the readers, lecturers, and singers are communicating their various departments into the big microphones. Piano music is played on a grand of enormous power and size, on which the telephonic appliance is fixed. For orchestral music there are special transmitters with sound funnels four feet in diameter. The staff consists of two business managers, two principal editors, six sub-editors, twelve reporters, and the eight stentors—these last with voices which the old Romans themselves might have envied in forum or assembly.

So loudly do they shout the news of the world, that a "solo" of ten minutes quite exhausts the strongest. The company owning the newspaper has its own wires, and property owners have no right to make any charge for wires fixed upon their houses. I suggested to the managing editor that his position was unique in the journalistic world.

"True," he said smilingly; "we take no side, have no editorial opinions, simply because we have no leading articles."

"How do you manage your advertising?" I asked him.

"When an advertisement is transmitted over the wires," he replied, "it is sandwiched between two particularly interesting items of news, and so commands special attention. Our advertising charges as a general rule are fifty cents for twelve seconds of the stentor's voice."

"And here," the editor went on to say, "is the copy in Magyar of a Maurus Jokai *feuilleton*, two or three chapters of which have already been given. And so interested and excited are our subscribers, that they keep ringing us up—especially the children—asking when the stentors will get busy again unraveling a complicated and thrilling situation.

"We realize the responsibility of our position, and all our editorial staff, from editors to stentors, are most careful to tone down, alter, and omit items of news which might in any way be objectionable when delivered into the home.

"I have often marveled," the editor concluded, "why a country like America with its amazing enterprise and development has not produced a 'Telefon-Hirmondo' of its own on a far vaster scale than Budapest could possibly manage. You Americans like novelty; your advertisers are enterprising above all others. Possibly before long New York and Chicago, Philadelphia, Bos-

ton, and San Francisco will each have a 'Telefon-Hirmondo' of its own, bringing enormous profits to their owners. For all kinds of expenses are eliminated from the cost of production, such as paper, ink, typesetting, and a great and expensive staff."

RESULT OF THE MOTOR BOAT RACE TO BERMUDA.

The two motor boats, the "Ailsa Craig" and the "Idaho," which left New York on the afternoon of June 8 for a long-distance race of 670 nautical miles to Bermuda, arrived at their destination on the 11th instant after a very successful trip. As was to be expected, the 75-horse-power "Ailsa Craig" beat the 25-horse-power "Idaho" by a considerable margin. The elapsed time of the two boats was 65 hours and 49 minutes and 75 hours and 2 minutes respectively. The larger and more powerful craft beat the smaller boat, therefore, by 9 hours and 13 minutes, but as she was obliged to give the "Idaho" 8 hours 56 minutes and 38 seconds time allowance, she was declared the winner by 16 minutes and 22 seconds only. Her average speed throughout the entire distance was about 10.18 knots, while the "Idaho's" average speed was 8.92 knots. Fair weather was met nearly the whole distance, and it was only during the last night of the trip that the boats encountered strong westerly winds and high seas. The "Ailsa Craig" stopped her engine only once for a few minutes, for the purpose of adjusting an igniter. Only 550 gallons of gasoline were consumed by her engine in making the run. Both boats showed themselves to be staunch and seaworthy craft. The voyage brought out one point about sea-going gasoline cruisers, namely, that the engine room should be entirely separated from the habitable part of the boat, and should have especially good means of ventilation. Doubtless another year a considerably greater number of cruisers will participate in the race.

AUTOMOBILE RACES AND RECORD RUNS.

By far the boldest and longest transcontinental automobile race thus far attempted is the 9,300-mile endurance trip from Peking, China, to Paris, France, which was started on June 10 from the former city. Five touring cars and a tri-car are the contestants. These consist of two De Dion-Bouton touring cars and a Contal tri-car representing France, a Spiker touring car representing Holland, and an Itala touring car representing Italy and driven by Prince Borghese. The contestants were given a splendid send-off by the foreign ministers and residents of Peking. They expect to average something less than 100 miles a day.

To Walter Christie belongs the honor of being the only American to compete in the French Grand Prix automobile race, which will be run on the Dieppe circuit, on July 2. Mr. Christie's well-known front-drive racer has been thoroughly rebuilt and reconstructed since the last Vanderbilt race. The final tests of it, which were made on Long Island, previous to its being shipped abroad, showed that it was capable of a speed of 90 miles an hour, which would enable it to hold its own with any of the high-power foreign racing cars. We sincerely hope that Mr. Christie will meet with better luck this time than has been his lot heretofore.

The second great international race of the year—the 310½-mile race for the Emperor's Cup—was held on the Tanus circuit near Homburg, Germany, on the 14th instant. As there were 92 entries, two 155-mile elimination races were run off on the day preceding, in order to eliminate half of the competitors. In the race itself, French, Italian, Belgian, English, Austrian, German, and Swiss cars participated. The winner was Nazzaro on an Italian Fiat racer. A Belgian Pipe car was second, and a German Opel-Darracq third. The times and average speeds of the first three cars were: (1) 5 hours, 34 minutes, 26 seconds (55.76 miles an hour); (2) 5 hours, 39 minutes, 10 seconds (54.92 miles an hour); (3) 5 hours, 39 minutes, 59 seconds (54.82 miles an hour). The best time made in the elimination races was two circuits of the course (155.25 miles) in 2:50:20, which corresponds to an average speed of 54.68 miles an hour.

A helio-chronometer designed by Messrs. Pilkington & Gibbs, Ltd., gives Greenwich mean time by a simple direct solar observation. It comprises devices for adjustment in latitude, longitude, level, and azimuth. It is self-correcting for the equation of time by means of a disk divided and engraved to show the month and day; the disk can be turned to indicate the current date. The underside of the disk is a cam formed to represent the equation of time plotted as a polar curve and touching the cam is a lever carrying the upper pierced screen through which the sun can throw a spot of light on to the center line of the lower screen, the dial being turned about the polar axis to permit this. The imaginary mean sun is therefore advanced or retarded from the apparent sun by the amount requisite to cause the instrument to indicate Greenwich mean time correct to a few seconds.