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NEW YORK, SATURDAY, DECEMBER 24, 1887.

The next issue closes another volume, and if those subscribers to this paper—and there are several thousand of them—whose term ends with the year will remit for a continuance of the paper before the year closes, it will save the removal of a large number of names from our subscription list, and insure the continuance of the paper without interruption. By so doing the subscriber will be benefited and our subscription clerks greatly relieved.

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THE EADS SHIP RAILROAD.

We elsewhere illustrate and give the description of a recent achievement in the land transportation of war vessels. At the present time it is an event of some importance. The French nation, characterized by its enterprise in engineering and scientific fields, has executed an interesting feat. A torpedo boat was to be taken from Toulon to Cherbourg. Such vessels have proved anything but comfortable, or even safe, sea boats. Strength, seaworthiness, and accommodation, all are put aside in their construction in order to attain the highest speed. The land route, therefore, was tried, and the trial was a complete success. Without the least damage, the transportation was accomplished. The delicate sides, less than an eighth of an inch in thickness, were uninjured. The vessel rested on a simple cradle, and was taken on the regular railroad. We cite this experiment as of special interest at the present time. Less than a year ago we were called upon to note the death of James Buchanan Eads. Independent of the personal sorrow that this event occasioned, a sincere feeling of regret found origin in the fact that he had died without witnessing the successful accomplishment of his greatest project—the Tehuantepec ship railroad. By his resistless energy, which had overcome so many obstacles, natural and personal, that stood in the way of his other achievements, he had brought the work well forward. The engineering details had all been fully executed. The company had been formed, and the route selected. All that he waited for was the congressional action necessary for his enterprise, which is of international character. He died before Congress took the desired cognizance of his great plan.

All is as he left it. A new Congress has assembled. The Tehuantepec Ship Railroad Company is now in the field, ready to undertake the enterprise and still awaiting the action of the legislature. From every point of view the United States should encourage the promoters.

The plan is eminently practical. The use of marine railways for hauling vessels out of the water for repairs is old. Thousands of steamers and craft of every description are thus treated every year. Among them are the weakest kind of structures. River steamers, with their longitudinal trussing or hog-frames, ready to receive every strain, and show its effects, ascend the inclined road without injury. The devices used for cradling them are of the crudest description. No attempt is made to adopt any such improved system as that applied in the Eads plan. Thus, in the harbor of New York the daily proof of its practicability may be seen by all. For if it is possible to haul ships, with imperfect appliances, up an inclined railroad three hundred yards in length, a fortiori it must be easier to draw them upon a special railroad, carrying a perfected cradle, supporting the ship at every point.

The transportation of the French vessel proves it most forcibly. Here a large torpedo boat was carried on a simple cradle on ordinary railroads many miles through France. It crossed other roads and went around curves without trouble and sometimes at the rate of twenty-five miles an hour. No condition was in its favor. The vessel was of the most fragile character, and was barely seaworthy. The journey was nevertheless performed without incident, and a distance of about eight hundred and fifty miles was covered. Compared with this distance, the Tehuantepec route, about one hundred and fifty miles, seems short.

It is now considered that this method can be used for torpedo boats. The establishment of the fact, however, goes for much more than this. It proves the sound judgment of the best American and English engineers. By such the Eads railroad has been critically examined and discussed. Their opinions have been given emphatically in its favor.

A ship at sea is exposed to far more severe strains than she would ever meet on the railroad. A wave running lengthwise carries with it an upward strain of many tons, followed and preceded by downward strains of equal or greater extent. As a ship pitches and rolls, the most complicated and severe stresses are applied to her plating and frames. Longitudinal and torsional strains, the latter aggravated by her masts and ballast and general dead weight, are continually at work upon her structure. Yet all is withstood. A ship is built upon the lines of the most advantageous distribution of material. The hollow hull, with its curving contour, represents the perfection of the tubular structure. When iron ships were first proposed, one of their prominent advocates said that a properly built iron vessel could be held suspended by her bow and stem without serious flexure and without injury.

It is not too much to say that, substantially, this very thing has been done in the tubular bridges. In them a relatively light iron tube is held by its ends with its center quite unsupported. Not only does this suffice to carry its own weight, but it constitutes one of the stiffest and strongest bridges known for railroad traffic.

In situation the ship railroad has everything in its favor. It is several hundreds of miles nearer the United States than the canal routes. Its completion by an American company will place one favorite method

of isthmus transit in the hands of Americans. It will compete with the canal, or canals, when they are completed. If started now, it will be finished long before either of them, and will be in successful operation, carrying ships through the semi-tropical forests, while the dredges and excavators are wearily removing countless tons of earth from the projected canal routes.

The sanction of Congress is asked, and should not be withheld. The apparent boldness of the project, coupled with its national origin, should recommend it to the legislature.

A committee of the Senate has reported in its favor. The distinguished engineer who conceived the project has left it complete and worked up to the last detail. To the fiftieth Congress is left the honor of erecting a suitable monument to the greatest engineer of his day. The Tehuantepec railroad will be his best memorial, and we cannot but believe that all desired congressional action will be freely taken.

In the transport of the French torpedo boat it is not too much to say that the far reaching influence of the American engineer is discernible. For it is highly probable that the project so successfully carried out had its original suggestion in Captain Eads' ship railroad.

A GREAT RAFT OF LUMBER.

A giant raft of timber is now expected at this port. It left Nova Scotia on December 8, in tow of the steamship Miranda. The launch took place near Port Joggis, on an inlet of the Bay of Fundy.

The leading features of its construction, which form the subject of a patent, are as follows. In general shape, it is a pointed cylindroid of elliptical section. It is composed of logs chained together, their attachment being re-enforced, and the structure consolidated by interwoven withes and small branches. Through the center a 2 1/2 inch chain is carried, which is inclosed in a solid boxing. In total length, this chain is one thousand feet, leaving about four hundred feet free for anchoring or towing. The central cross section is an irregular ellipse, 65 feet wide and 39 feet deep. For four hundred feet of its central portions the sides are parallel; then they taper at bow and stern to a section 25 feet wide. This is the extent of the pointing. The total length is 585 feet. It was put together in a substantial cradle that was built in permanent shape, as it is proposed to build in it other rafts. The logs were laid longitudinally, and after each course was in place, branches and withes were laid across them, and their free ends were turned in over the next course. Every seven feet marks the point of attachment of two lateral chains that run out horizontally through the mass of logs. These connect with other chains that surround the whole mass. The latter are tightened by hydraulic jacks. The central chain, upon which the pull comes in towing, tends to still further bind together the logs, as it draws upon the surrounding bindings. The chains weigh two hundred tons.

In the center around the central cable, the hard wood is stowed, while the softer and less valuable timber forms the outer layers. It contains 25,500 sticks of timber for spars and piling, and one half a million board feet of maple, beech, and birch.

The launch was executed with great success. The great structure as it ran down the ways occupied 32 seconds in going 1,600 feet. It is estimated to weigh 11,000 tons, or 2 1/2 times as much the Great Eastern. The lumber it contains would fill seventy schooners. If the venture proves successful, it will tend to make quite a revolution in the lumber trade.

Mr. James D. Leary, of this city, is the owner of the raft, and is a firm believer in the capabilities of the system.

PATENT "INNOCENTS" AGAIN IN CONGRESS.

A lively discussion lately took place in the United States Senate, when the Hon. J. Z. George, of Mississippi, introduced his bill (S. 787) to protect "innocent purchasers," and asked that it be referred to the Judiciary Committee, instead of to the Patent Committee, where it properly belongs.

The following is the text of the bill: "A bill to protect innocent purchasers of patented articles, and for other purposes (S. 787).

"Be it enacted, etc., That it shall be a valid defense to any action for an infringement of any patent, or any suit or proceeding to enjoin any person from the use of a patented article, that the defendant therein, or his assignor, purchased the patented article for use or consumption, and not for sale or exchange, in good faith and in the usual course of trade, without notice that the same was covered by a patent, or without notice that the seller had no right to sell such article; and in all such cases notice received after such purchase shall not have the effect to impair in any way the right of such purchaser as absolute owner.

"Sec. 2. That all patents for any discovery or invention hereafter granted by the United States shall be subject to purchase by Congress, for the use of the people of the United States, at such reasonable valuation, and on such terms, and in such mode, as may be provided for by law; and all such patents shall be consid-

ered and treated in law as issued subject to that condition."

Substantially the same bill has been presented to Congress for several years past, and has suffered defeat. Its object is well known, namely: Under the specious pretense of protecting innocent purchasers, it makes patented inventions, practically, free to the public.

It encourages infringers and discourages the inventor. It prevents the latter from controlling his invention. It takes from the author his right to make, use, and sell his own invention, and hands that right over to the infringer. It tends to overthrow or cripple the vast manufacturing industries that now flourish under the protection of the patent laws, and practically nullifies those laws.

Mr. George appears to have been satisfied the Patent Committee would not sanction his bill, but hoped the Judiciary Committee might do so. He said:

"As the Senator from Connecticut has stated to the Senate, that question has been before the Committee on Patents on two or three occasions, I believe, and that committee has not seen proper to grant relief—the relief which I and which a good many members of this body think the people of the United States are entitled to; and as the bill refers to the application of an important principle of law, having reference to the rights of innocent purchasers without notice, a purely judicial proceeding, as my friend from Tennessee [Mr. Harris] suggests, I thought it was proper under all these circumstances that it should go to a new committee.

"As far as I can learn, there has been more wrong and injury done under the patent laws by suits against men who go into open market, into the stores and warehouses of the country, and buy in good faith articles which they suppose the seller has a right to sell, and then are afterward brought up before a court, fifty or one hundred or two hundred miles from their homes, to account for it; and as the Patent Committee had not seen proper to extend to such cases this very salutary principle of the common law, the protection of innocent purchasers, I thought it was proper and right that another committee should consider that question also: and for that reason, and in addition to the reason which I gave first, that the Judiciary Committee was a very appropriate tribunal to determine it, I insist, in behalf of the rights of many persons in this country who have been injured by the present law, that this bill shall go to the other committee."

We think Senator George will find it difficult to produce any considerable number of examples where "innocent purchasers" have been brought up before a court fifty or one hundred or two hundred miles from their homes, as he asserts.

The existence of such wrongs we think will prove to a great extent to be imaginary. The entire amount of litigation about patents is not large. However, all who own interests in patents, as well as the public in general, are interested in knowing the full extent and nature of the injuries which the innocent infringers are suffering. The Senator will have ample time to present his evidence, and we urge him to make it as fair, strong, and complete as possible. In this way only can his legislative colleagues in the Senate and House become rightly informed and be enabled to vote intelligently. If such disastrous abuses exist as he claims, they should be rectified; and probably this can be done without nullifying the rights of patentees in the broad manner contemplated by the above bill.

The Senator's effort to have his bill sent to the Judiciary Committee was defeated by a vote of 40 to 25, by the prompt action of the Hon. O. H. Platt, of Connecticut, who objected, and in answer to Senator George said:

"As it seems to me, the Patent Committee has been in no way open to the charge of dereliction in dealing with this subject. The bill has never been before that committee, I think, but what it has received consideration and report. I do not mean this particular bill, but I mean bills embracing the same subject; and those bills so reported, if my memory serves me, have in more than one instance received the approval of the Senate. Now, why a bill bringing the same subject again before the consideration of the Senate should be taken from the committee which has heretofore had the consideration of it, as it was supposed properly, and be given to another committee, I cannot see, unless it be for the reason given by the Senator from Mississippi, that the Patent Committee have not reported upon the bill as he thinks they ought to have reported. If that principle is to be adopted in regard to the reference of measures before the Senate, as I said before, it will upset a good deal of the procedure of the Senate, and will reach a great deal further than is thought at the present time."

Senators Teller of Colorado, Chace of Rhode Island, Hoar of Massachusetts, Edmunds of Vermont, and others made remarks adverse to a reference of the bill to the Judiciary Committee.

HECTOGRAPH ink, both purple, blue, and black: Take 1 part aniline of desired color, dissolve in about 7 parts water and add 1 part glycerine.

The Way of a Man with a Motor.

Mr. Keely, the man whose motor was to revolutionize the machinery of the world, is hardly off with the old force before he is on with the new. At a meeting of the stockholders of his company in Philadelphia, Dec. 14, Mr. Keely explained that, while experimenting with his etheric or vapor force, he has run against another form of energy, the properties of which are so captivating as to cast into shade those of his first enchantress. This new siren sings so ravishing a song that unless the stockholders follow the methods of the wily Ulysses, plug up their own ears, and lash Keely to the bottom of the boat, they will run great risk of losing that which they do not desire to lose. If their hearts vibrate in sympathy with Keely's new kinematics, they will be apt to find their pockets out of tune with their great expectations.

Mr. Keely promises nothing, but he raises high hopes by asking those who still put faith in him to open their mouths and shut their eyes and see what he will give them. As yet he has given them nothing, though they have stood with closed eyes and wide open mouths these many years. Now, Keely says that his etheric force is but a phantom which positively refuses to materialize, charm he never so wisely, but if the stockholders will only "hold on a bit," he may, he has some reason to believe, in due process of time present them with a "vibratory sympathy" which will make their eyes fairly jingle in their heads and coin jingle sympathetically in their pockets. Meantime they must take his word for it, and we really do not see what else they can do, unless they drop Keely at once, and put down to profit and loss the money they have already spent in his vaporous projects and fruitless imaginings. The company's treasury is reduced to twenty-four dollars, and by replenishing it they will be but throwing good money after bad.

As anarchists have a pleasant way of likening their case to that of John Brown, so believers in the Keely motor look upon Keely as a Palissy the Potter—a great inventor under difficulties. This is the sentimental and vagarious side of the matter, for, of course, their purpose in assisting him is to make money. They are deluded. One of the ways in which they are deluded has been pointed out by Keely himself. The stockholders had provided him with money with which to develop his etheric force, and at the late meeting Keely explained that for some time he had not been working at etheric force, but at something quite different. For people who like that sort of conduct that is the sort of conduct that such people like, but it will not muster with men of common sense. If it passes muster with the stockholders, that fact alone should show them that they have not common sense, and they should withdraw on general principles. Hope deferred maketh stockholders sick, unless they are willing to take all a gambler's risk, and in that case they are only gamblers, willing to play on with overwhelming probabilities against them.

The chief reason for the general opinion that the Keely motor has nothing in it is that it sounds empty, and nothing has ever come out of it, while Keely steadily refuses to let anybody look into it. This is not the method of a sincere man working honestly toward an object in which he has faith.—*N. Y. Commercial Advertiser.*

The Annual Report of the Secretary of the Navy.

The annual report of Secretary Whitney, which has just been rendered, is, in view of the large amount of attention that has been devoted to naval engineering during the past year, a peculiarly interesting and valuable document. In it the present aspect of naval attack and defense are considered at length, the secretary's views on the subject are given, and the authority for his ideas are disclosed. Much of the recent work done in the direction of building up a United States navy has been described in our columns. There would have been more to show were it not that the work is still in an incipient condition. The next twelve months will witness great progress.

Three new manufacturing branches have been established, to supply material under contract with the United States government. Plant for the manufacture of steel forgings for heavy guns, of armor plates for ironclads, and of machine and rapid-firing guns, comprise the three divisions. The new machinery of the Bethlehem Steel Works, the report states, is believed to be equal to any in the world. This is devoted to heavy forgings for guns and to armor plates. The quality of the steel is considered a distinct advance upon the best practice, and the price is within twenty-five per cent of what it would amount to were the work done abroad. The cruiser now constructing at San Francisco is alluded to in complimentary terms, not only as regards its merits, but also as a possibly important factor in developing or inaugurating a new manufacturing industry on the Pacific coast.

Of the new vessels, four are in commission; one, the Chicago, is waiting trial; ten vessels, including ships of war, cruisers, and gunboats, are building. In addition to these, the dynamite cruiser and a first class

torpedo boat, the latter by the Herreshoff Co., are in process of construction or contracted for. The system of arriving at the designs for two of the fast cruisers is described. The plans for their construction were purchased abroad. But not content with these, many modifications were introduced, until the original designs have been improved beyond identification. The speed for these vessels is, under the terms of the contract, to be nineteen knots. The plan of reaching the design is summarized by the secretary as "adopting at the outset the best known methods, which native ingenuity will enable us to improve upon," thus keeping pace with the most forward.

The report speaks in dubious terms of the utility of the modern torpedo boat. Their high speed is attained at the sacrifice of protective armor, and light frames and plates have to be used for their construction. This has detracted much from their merits. The importance of the torpedo itself in modern warfare the secretary believes cannot be overestimated. But, to place these weapons, he suggests the use of partially submerged torpedo vessels, as of the Nordenfelt type, or of pneumatic projection, as in the Zalinski system. In spite of the great success of the pneumatic dynamite gun, the weapon alluded to, the report, with great conservatism, suspends final judgment. The completion of the new dynamite cruiser is waited for in order to disclose what the guns can do when afloat. If this trial should prove favorable, the report says, it would remove many doubts and difficulties. We hope that this will spur on the constructors and designers of the dynamite cruiser to renewed exertions, and will incite them to make as brilliant a success of the guns afloat as they have achieved in shore practice. The secretary admits that for shore and harbor defense its accuracy is substantially established. This refers to the trial last September, which was illustrated and described in our issue of October 1 of the present year. The trouble to be encountered in using it on ship board is the determination of the range. Owing to its high trajectory, this is an essential thing to be known to secure accurate practice. At the same time it must not be forgotten that this height of trajectory makes its range less subject to disturbance from the pitching of the ship, and that, as a target, it has the length of a ship instead of its height.

A very interesting portion of the report deals with the establishment of a naval reserve, a sort of marine militia. Some arrangements, it states, should be made for the mobilization of merchant steamers in war, and the government should exercise due oversight over the construction of new vessels, so that they are in general adapted to use as transports or in other war service.

The subject of monitors and of the construction of provisional vessels of inferior type is treated. The report is in opposition to both. Monitors it considers antiquated, and no longer serviceable vessels, even for defense. It recommends that all appropriations be spent in producing the best attainable ships, and opposes the diversion of money from this end. Authority is asked, in furtherance of these views, for the construction of three more fast cruisers of the highest type. In six years more, the chief of construction states that but four serviceable cruisers will be left in the navy of this country, so that the recommendation would seem well established.

The general tenor of the report indicates progressive ideas and a readiness to examine all new suggestions. In view of this disposition, it seems curious that but three finished torpedoes were presented to the Torpedo Board by the inventors. A new navy is now in process of creation. This is the time for the inventor to do his most patriotic work in devoting his talents to the protection of our shores from possible invaders and bringing the inventive genius of America again before the world in a hitherto somewhat neglected department.

Flight of Young Homing Pigeons.

Eighteen birds owned by C. O. Barrett, Dorchester, Mass., were liberated in Forest, Lambton County, Ont., at 6:34 A. M., on Tuesday, October 25. The first return was Leslie P. (H. 237), which arrived in the home loft at 4 o'clock Thursday afternoon. The air line distance covered is 540 miles, the most remote point from which a bird of the year has ever returned. The record to be beaten was made a year ago, from London, Ontario, to the Wagner loft, Boston; distance, 525 miles, the first bird returning on the morning of the second day after the start. This journey gives the Barrett loft the record for every distance of the season, winning for it all the special prizes open to all, including the Hudson badge. The record is not only good for distance, but it is the second best of the year for any age from over 500 miles, and the best from over 510. The best from 500 or over was made by the bird Staunton to the loft of George Darby, of Boston.

AT Balakhan, near Baku, Russia, a new petroleum spring, which rose 150 yards, flooded the country, impregnating everything. Nobody ventures to light a fire, for fear the town will go off like fireworks.