

lucidity, and a candid reading of this part of the work would be of considerable use to those editors and legislators who aspire to deal intelligently and justly with the intricate and serious economic questions which are pressed upon public attention by the rapid changes constantly taking place in modern business methods.

In his severe impartiality and his determination to treat his subject from a strictly scientific standpoint Mr. Greene leaves the reader, in most cases, to his own resources for practical illustrations from real life of the theories presented; though he introduces brief references to many well-known concrete examples of financing which will afford illustrations for readers of experience in the financial world, and will serve as hints for the inexperienced.

The chapter titles, indicating the scope of the work, are: 1, Bonds and Stocks; 2, Forms of Corporate Enterprise; 3, Railway Bonds; 4, Subsidiary Companies and their Securities; 5, Corporate Accounting; 6, The Examination of Railway Reports; 7, Public Policy toward Corporation Profits; 8, Corporation Reorganizations and Receiverships. The book is well worth having, to anyone interested in railroad properties, for the sixth chapter alone. Even those who already have considerable appreciation of the nature of railroad reports are likely to find this chapter useful for reference, for it sets forth in accessible shape many little points which are liable to be overlooked by reason of their multiplicity and of the obscure character of the information which often has to be dealt with in trying to study an annual report.

Transactions of the American Society of Mechanical Engineers. Vol. XVIII., being the thirty-fourth meeting, New York, 1896, and the thirty-fifth meeting, Hartford, 1897. New York: Published by the Society, 12 West Thirty-first street.

This volume of the Transactions has 1119+XXIV. pages, and contains the papers and discussions of the meetings indicated in the title. It has a good table of contents and pretty full alphabetical index, and thus the great amount of valuable information contained in it becomes available to the student. The papers, including committee reports, listed in the table of contents, are 48 in number.

TRADE CATALOGUES.

Steam Boilers. Illustrated catalogue. By William H. Fowler, Assoc. M. Inst. C. E., etc., etc. Yates & Thom Canal Foundry, Blackburn, England. Price, five shillings.

Messrs. Yates & Thom are boiler makers, iron founders, millwrights and engineers (established in 1838) of repute and standing in their own country and abroad. This catalogue concerns only boilers and boiler fittings; an engineering catalogue is also published by the house. The boiler catalogue describes the Lancashire boiler proper and in various modified forms, as for example multitubular and water-pipe Lancashire boilers; Cornish boilers, the Fairbairn boiler and many different kinds of boilers, externally and internally fired. It describes also a considerable variety of fittings and gives certain useful tables of horse-powers of various boilers, properties of saturated steam, pressures in pounds and kilograms, and finally forms of estimates and specifications. The first 50 pages are given up to general discussion of many topics as, *e. g.*, efficiency, tests, combustion, power, etc. The numerous engravings are mostly from good line drawings and are actually illustrative, and the book is admirably printed and is made accessible by a copious index.

The Pearson Jack.—The Pearson Jack Co., 64 Federal street, Boston, Mass., sends a catalogue describing this device. As may be known, this jack consists of a right and left hand screw which runs in and out of two long nuts forming the barrel of the jack. The outward ends of these nuts are rounded, and these ends fit into corresponding sockets in the top and base plates, both of which are loosely attached to the ends of the jack. The older style of this jack was worked by a bar which entered holes in the square middle portion of the double ended screw. The latest jacks of this kind are provided with a spring ratchet to turn the screw. This is quicker than the bar and is more convenient. The Pearson jack will lift 14 in., and will swing a car 18 in. at one setting.

The pamphlet, which contains 16 pages, is illustrated with several pen-and-ink sketches and some half-tones. While we are not usually considered as art critics, and seldom have to pose as such, still we can hardly help observing how deplorably the draughtsman of some of the sketches must have neglected his early training in figure drawing.

American Society of Mechanical Engineers.

The attendance at the annual meeting of the American Society of Mechanical Engineers, held in New York last week, was the largest in the history of the Society. In our last issue we gave abstracts of nearly all the papers, and the remainder will be found in this issue, or next week. It would be impossible to give at this time an extended report of the discussions, but a few notes may prove of interest.

Mr. Gus C. Henning, a delegate to the International Congress on Testing Materials, held at Stockholm (reported in our last issue), gave an account of the proceedings of the conference, after which it was resolved that the Council appoint a committee to act jointly with a committee to be appointed by the Inter-

national Association for Testing Materials, the object being to establish standard specifications for the inspection of engineering materials.

The report of the boiler trial committee, of which Dr. Chas. E. Emery is Chairman, was read by Mr. Kent. The discussion, for the most part, took the form of suggestions to the committee, in order that they might present, as far as possible, a final report that would be the best for all concerned. Doctor Emery stated that careful thought for two years had been given to the subject, and that the report was virtually a compromise throughout. Mr. R. S. Hale believed that the report should contain a recommendation as to the thickness of the fire carried and the method of firing, and his objection to the form of the code which provides that the outside surface of tubes be taken as the measure of their heating surface resulted in an animated discussion. Mr. Dean argued that the simple fact of the practice of the navy to follow this rule was no reason why the Society should fall into what he regarded as a serious error.

A communication was then read in which it was pointed out that railroads are sometimes annoyed on account of different threads which are cut on the coupling unions. After discussion it was decided that the former committee on standard pipe threads should act jointly with the committee from the American Railway Master Mechanics' Association and the Master Car Builders' Association to devise some standard.

In the discussion following the presentation of Mr. Dean's paper on the Reduction in the Cost of Steam Power from 1870 to 1897, which is printed nearly in full in this issue, Mr. Sterling criticised Mr. Dean's position that return tubular boilers were still the standard. Mr. Kent questioned whether fire grates were any better now than they ever were, or that vertical engines had produced a saving over horizontal of seven per cent. The paper on Boiler Tests, Classification of Data and Plotted Results, pointed out that, according to the classified results, the vertical tube boilers gave the best results, which Mr. Kent believed due to the fact that the author had included some tests that were not in keeping with those of average practice.

On Wednesday evening a reception was held at Sherry's, President and Mrs. Warner and President-elect and Mrs. C. W. Hunt receiving the guests.

After the discussion following Mr. Stillman's paper on "A Water Purifying Plant," Thursday morning, Mr. S. M. Green described an electric purifier, which Mr. Kent pronounced a humbug. Professor Thurston stated that the U. S. Navy had used practically such an arrangement, inserting a zinc plate in the boilers of vessels, to produce an action similar to that of the voltaic cell, and others reported instances of the successful working of what is usually termed the electric purifier. Mr. Henning stated that it was well known that electric current in a boiler would prevent crystallization under certain conditions, the residue falling down in the shape of mud, which could be conveniently removed.

After luncheon at the close of the Thursday morning session, Mr. G. C. Henning showed a new method of reproducing colors in photography and exhibited some very excellent sample work.

"An Accurate Cost Keeping System," by Mr. H. M. Norris, was read Friday morning, and brought out a somewhat interesting discussion. A few of the members believed that no accurate method applicable to the many varying conditions could be devised and that an attempt to follow out any scheme would not be advantageous in most cases. A few plans, however, were submitted as examples of those now practiced in different shops. Mr. C. W. Hunt urged the members to visit his shops in New York City, and examine the methods employed from beginning to end. Particular attention was called to the unaccountable items that figure up to a large amount by the end of the year, and reference was made to cases where superintendents or other officers had taken the time of the employees to do odd jobs for them and which in the aggregate amounted to quite a large percentage of the earnings. In such cases it was stated, not only the actual time of the men should be charged to such accounts, but also an additional amount equal to that in which the men would be able to earn for the company in that time, which is twice the amount that would be charged to an outsider.

Mr. Chas. T. Main's paper on "Valuation of Textile Manufacturing Property" called forth from Mr. Rockwood and others a discussion on the proper value that should be placed on machinery that had been used. Opinions differed as to whether an actual value could be placed on such machinery.

The subject of dustless buildings brought forth interesting discussions as to the composition of the dust that finds its way into the office buildings in the city, and as to the height the dust and insects reach in the lower part of New York. Regarding the latter point, Mr. Henning pointed out that in the St. Paul building no trouble was experienced with flies and insects above the seventh floor.

The paper on the Stevens' Valve Gear for marine engines was read by the Secretary, after which Mr. Andrew Fletcher, the author, gave a very entertaining account of the early work of Francis Stevens in making and introducing his valve gear. Mr. Fletcher's reminiscences were in fact a history of the conception and development of valve gears in this country, inasmuch as the early Stevens' type has been used ever since, either in its original or its modified form.

After the remainder of the paper had been presented, the meeting adjourned to convene at Niagara Falls in June next.

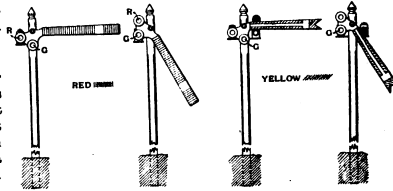
Distant Signal with Double White-Light Indication.

Mr. J. I. Vernon, Supervisor of Interlocking of the New York, New Haven & Hartford, at Mansfield, Mass., who has suggested the use of two white lights, placed in a horizontal line, for the night danger indication on distant signals, has sent us sketches, reproduced herewith, showing his proposed arrangement.

It will be seen that the plan requires no complication in standard materials, the same blade-casting being used for both the home and the distant signal. The extra lantern is of the same pattern as all other semaphore lamps. This, with the necessary bracket, and a sheet metal screen to attach to the upper side of the blade, will cost only about \$3.50 for each distant signal.

In the illustration the colors of the glasses, red and green, are indicated by the letters R and G. The spectacles unmarked have no glasses.

The adoption of two white lights as a caution signal would conform to the principle employed in the use of torpedo signals, where a signal consisting of two detonations requires the engineman to bring the speed of his train under control, while one detonation indicates stop. Where a green light is used to indicate all-clear,



Distant Signal with Two White Lights in a Horizontal Plane.

a single white light in a fixed signal indicates danger, so that it is consistent to have two white lights give the same indication as two torpedoes.

One objection to the use of a red and a green lamp side by side, for a distant signal, is that the red may be obscured by snow or smoke, while the green is still visible, thus wrongfully indicating all-clear. Again, the use of a special pattern of lantern requires special safeguards to prevent inexperienced lamp men from putting a lamp on the wrong post. If lamps are alike this error cannot be made.

Cleaning Passenger Cars.

In a discussion on the subject at the meeting of the St. Louis Railway Club, which was held Nov. 12, Mr. H. M. Smith, Master Mechanic of the Terminal Railroad Association, St. Louis, said:

"One of the most effective aids introduced in late years for the purpose of inside cleaning is the use of compressed air, which is used extensively and exclusively by the Terminal Company. In my opinion a car cannot be thoroughly cleaned without the use of compressed air.

"We use carboric acid diluted with water for mopping all cars, and muriatic acid for cleaning urinal and hopper bowls. This is not only a good disinfectant, but removes all stains and discoloration.

"Since the opening of the new station we have cleaned 7,000 cars in one month. Up to the present time I have been unable to obtain any reliable information as to the cost per car from any company doing this class of work. At the annual meeting of the Master Painters' convention this year the subject of cleaning passenger cars at terminals was under discussion. Mr. Byrne, of the Chesapeake & Ohio, in answer to the question of cost, stated it cost them \$1.30 per car for labor only. He stated that his labor cost \$1 per day. At the October meeting of this Club Mr. Gohen stated that on one division of the Big Four the cost was about 25 cents per 100 miles run, but he would judge their average cleaning cost from 15 cents to 17 cents per 100 miles run.

"Under the system employed by the Terminal Company of St. Louis we are enabled to arrive at the cost of cleaning any of the cars of a passenger train generally to the fraction of a cent. In the month of May, 1897, the average cost per car was 48 cents. This was the lowest ever reached. For the month of October the average cost was 50.7 cents. The highest on any line was 66.3 cents; the lowest was 30 cents per car. This includes labor and material. There are 11 roads that have their cars cleaned by the Terminal Company. The price varies on each road and on no two roads is it alike. A train composed of plain day coaches is cleaned for a certain price—you add a chair car, the price is increased; you attach a parlor car, the price is again changed. A vestibule train, with brass-mounted railings on the platform, increases the cost of cleaning.

"Some of the trains we clean run as far south as Galveston, Tex., a distance of 1,000 miles; others run as far east as Buffalo, N. Y., a distance of 732 miles. On the Eastern lines, particularly where there are several lines running in the same direction, competition is active, and nothing but equipment in first-class condition will meet the requirements of the management."

In continuing the discussion, Mr. J. A. Gohen, Master Painter of the Cleveland, Cincinnati, Chicago & St. Louis, promised to submit figures showing the cost of cleaning cars. His statement is as follows:

"To wipe outside of coach, sweep and dust inside, clean