

the position of Examiner in the Patent Office, how useless must it be, unless it includes some mode of measuring the judgment and perceptive faculties of the applicant, as well as other qualities too subtle and fundamental to be weighed in the scales of a school text book! The Patent Office itself can furnish examples of abundant scientific and literary acquirement, and brilliant examination record, combined with a chronic and incurable inability to act sensibly and wisely as examiners.

**NARROW GAGES FOR RAILWAYS.**

There are two classes of considerations which form the basis of opinion with reference to narrow gages for railways. The first includes commercial, the second, engineering, data relating to railways of this character already built and in operation.

Commercially considered, that kind of railway is the best which pays the best dividends. Those railways pay, or, in the hands of honest directors, will pay, the best dividends, in which the first cost, and the annual expenses of running and repairing, are least in proportion to the carrying done upon them. Narrowing the gages of many roads, built, building, and projected, would not reduce their carrying capacity below what they may reasonably expect their traffic to ultimately become, while it would reduce, more or less, the first cost of everything used, and lessen current expenses. This has been amply proved by experiment. There are, however, some roads that are now running nearly up to their capacity. Such roads cannot economically narrow their gages. Commercially, then, these roads are favorably regarded as affording a solution of how cheap yet sufficiently efficient railways may be built and operated with profit to their owners.

In an engineering point of view, all necessary to consider is—can these roads be practically and economically constructed and operated? Experience has answered "yes" in a most emphatic manner to this inquiry. It is therefore evident that the day of narrow gages has dawned.

The experiments with narrow gages have been principally confined to various parts of Europe and to India. Quite a number have been operated with a saving in first cost of thirty per cent, and a saving in running expenses of twenty-five per cent over that of the ordinary wide gage roads doing the same business.

One of the principal savings is in reduction of the wide disproportion of paying to non-paying weight existing on wide gage roads, estimated by Mr. Fairlie as being only one to seven in freight trains, and one to twenty-one in passenger trains running on wide gage roads.

The celebrated Festiniog railway, with two feet gage, carries three times as much in proportion to the weight of its cars as the best wide gages.

The public has the right to say something on this matter. The reduction of gages on passenger roads would greatly reduce the comfort of railway travel in its modern perfection. A violent protest against such reduction, on roads depending in great measure on passenger traffic, might be expected, while in parts of the country where cheap railways or none must be put up with, narrow gages would be hailed as affording facilities for travel and freight traffic, of which they would be long deprived if they had to wait till four and one half feet gages would pay.

**REMARKABLE FLOOD.**—Papers from the Cape of Good Hope give accounts of a remarkable and sudden flood which has occurred at Victoria West. It is supposed to have been caused by the bursting of a water spout. In the space of two hours thirty houses were washed away and one hundred lives lost. The flood seems to have commenced at the farm of a Mr. Hugo, some distance from the town. His house, homestead, and stock were all swept away, his wife and all his children but one infant (which he managed to save by swimming with it in his arms), were drowned. He describes the scene as appalling beyond measure. First he and his wife heard a sound "like iron falling from the sky;" they looked out, and saw a huge black mass of cloud sweeping along the earth toward them; they caught up the children and rushed from the house, but it was too late, and everything was swept away in the torrent, save Hugo and his infant; even their escape was little short of miraculous.

**COAL ON THE ISTHMUS OF PANAMA.**—An unexpected and most important discovery of coal beds on the Isthmus of Panama, made three or four years ago, has recently been brought practically to public attention by a trial of the coal at Aspinwall. The result leaves no doubt whatever that the mineral is of excellent quality, superior to the Cumberland coal, and quite equal to the best Newcastle.

The coal beds lie on the River Indio, about thirty-five miles from Aspinwall.

**AMERICAN POMOLOGICAL SOCIETY.**—The thirteenth session of this institution will be held at Richmond, Va., on September 6, 7, and 8, of this year. It will be in conjunction with the exhibition of the Virginia Pomological and Horticultural Society. A long list of premiums, for the best fruits and wines of different classes is announced.

**LAST OF THE NOVELTY IRON WORKS.**—These once large and prosperous works are about to be closed out at receiver's sale. In their prosperous days they accumulated a great deal of first class expensive machinery. That which has not been previously sold will be offered at auction on the 6th July. See advertisement for particulars.

ALL the members of the royal family of Prussia are required to learn some trade; the present Emperor of Germany chose printing, and, it is said, spent three years at the case.

**NEW BOOKS AND PUBLICATIONS.**

**AMERICAN CYCLOPEDIA AND REGISTER OF IMPORTANT EVENTS FOR 1870.** Embracing Political, Civil, Military, and Social Affairs; Public Documents; Biography, Statistics, Commerce, Finance, Literature, Science, Agriculture, and Mechanical Industry. Vol. X. New York: D. Appleton & Co., 549 and 551 Broadway. 1871.

This work is too well known to the reading public to require any remarks as to its general scope and character. The present volume does not give evidence of very wise discrimination in the selection of matter. At least, on such topics as we are in the habit of discussing, and with which we are most familiar, we find some very important things not referred to; while minor matters are afforded space. For instance, we find nothing regarding the Suez Canal, the Mont Cenis tunnel, the bridge at St. Louis, the operations at Hell Gate, the Hoosac tunnel, etc., while several comparatively unimportant engineering works are mentioned at greater or less length. In looking at other departments, we have some basis for a similar criticism. A work of this kind ought to be edited with ability and care, and while we do not wish to depreciate the value of this volume, we certainly think it might have been improved. The article on the Franco-Prussian war is a comprehensive and well condensed account of that remarkable conflict. The article, "Chemistry," is also a well edited one. The same may be said of "Astronomical Progress."

**THE EYE IN HEALTH AND DISEASE:** Being a series of short articles on the Anatomy and Physiology of the Human Eye, and its Surgical and Medical Treatment. By B. Joy Jeffries, Lecturer on Optical Phenomena and the Eye, at Harvard University. Boston: Alexander Moore, Lee & Shepard. New York: Lee, Shepard & Dillingham.

There is, perhaps, no organ in the human body more systematically and ignorantly abused than the eye. The book herewith announced aims to correct this abuse by the dissemination of reliable information relative to its physiology and functions. While written in so popular a style that the unprofessional may read it understandingly, it will be found a book capable of adorning a professional library. Our readers will be able to judge of its merits from some extracts we shall make from it, and also from extracts we have already published from the *Atlantic Monthly*.

**LOCOMOTIVE ENGINEERING AND THE MECHANISM OF RAILWAYS.** A Treatise on the Principles and Construction of the Locomotive Engine, Railway Carriages, and Railway Plant. With Examples selected from the International Exhibition of 1862. Illustrated with sixty large Engravings and numerous Woodcuts. By Zerah Colburn, Esq., Civil Engineer. Parts 18, 19, and 20. New York: John Wiley & Son, 15 Astor place.

These numbers complete this magnificent work, which, as a whole, is superior to anything before published upon the subject of locomotive engineering. The work has been so frequently noticed in our columns that we need not again enumerate its merits. It is a work that ought to find a place in the library of every engineer.

**TROW'S NEW YORK CITY DIRECTORY.** Compiled by H. Wilson. For the Year ending May 1, 1872. New York: John F. Trow, Publisher, 52 Greene street.

This standard annual appears this year in new type, and adds to its other merits, a new colored map of the city, including the whole island, marking all the changes in street openings and in the two water fronts. It is a very large volume, and has evidently been prepared with the greatest care. It contains 200,933 names, and the labor required to canvass the names and residences of so large a number, and arrange them alphabetically, is a task that is not easily appreciated by the inexperienced.

**SIGN WRITING AND GLASS EMBOSSEING.** A Complete Practical Illustrated Manual of the Art. By James Callingham. To which are added numerous Alphabets. Philadelphia: Henry Carey Baird, 406 Walnut street. Price, \$1.50, by mail, free of postage.

Like all the works published by Mr. Baird, this is an eminently practical one, giving the plainest instructions and directions in regard to the art which forms the subject of the treatise. Judging from the sad want of anything like artistic design in the average sign writing we daily meet with, the work should find a large demand in this country.

**TRANS-MISSOURI STOCK RAISING;** the Pasture Lands of North America, Winter Grazing, etc. By Dr. H. Latham, late Surgeon N. P. R.R. Omaha, Neb., *Daily Herald* Steam Printing House.

This is a pamphlet, describing the vast region lying between the Arkansas on the south, British Possessions on the north, the one hundredth meridian on the east, and the summit of the Rocky Mountains on the west, where cattle and sheep graze out the entire year, without other food or shelter than is naturally afforded.

**AMERICAN NEWSPAPER DIRECTORY.** Containing Accurate Lists of all the Newspapers and Periodicals Published in the United States and Territories, and in the Dominion of Canada and British Colonies of North America. Together with a Description of the Towns and Cities in which they are Published. New York: Geo. P. Rowell & Co., Publishers and Newspaper Advertising Agents, 41 Park Row.

Those who have much advertising to do will find this book a valuable and reliable guide.

**THE PARENT'S GUIDE;** or Human Development, through Inherited Tendencies. By Mrs. Hester Pendleton. Second Edition. Revised and Enlarged. New York: S. R. Wells, Publisher, 389 Broadway.

This book is written with a good motive, and will do good. It tells many plain truths. Doubtless it contains some errors that the physiologist would point out, but the chief purpose of the book will not be defeated by them.

**TILL THE DOCTOR COMES AND HOW TO HELP HIM.** By Geo. H. Hope, M.D. From the Fifth London Edition. By a New York Physician. A Complete Manual of Directions in Cases of Accidents, indispensable to every Household. New York: G. P. Putnam & Sons.

A very readable, as well as useful, little book, one that will keep people from useless tinkering, and guide them correctly, till medical aid can be called.

**THOUGHTS FOR THE YOUNG MEN, AND THE YOUNG WOMEN OF AMERICA;** or, a few Practical Words of Advice to those Born in Poverty and destined to be Reared in Orphanage. By L. U. Reavis, St. Louis, Mo. New York: S. R. Wells, 389 Broadway.

A good timely, thoughtful, and morally healthy book. Any young man or woman will be the better for reading it.

**HISTORY OF SPRINGFIELD, ILL.** Its Attractions as a Home and Advantages for Business, Manufacturing, etc. Published under the auspices of the Springfield Board of Trade. By J. C. Power, Springfield, Ill. State Journal Print.

The facts this report contains, shows the home of the late President Lincoln to be the center of large manufacturing establishments, which probably accounts for our large subscription list from that place.

**ECLECTIC MAGAZINE.** W. H. Bidwell, Editor, Proprietor, and Publisher, 108 Fulton street, New York.

The July number is at hand. It is unlike any of the other monthlies published in this country. Its contents are made up mostly of selections from

other home and foreign periodicals, thus forming a cyclopædia of varied literature of the best kind.

**ATLANTIC MONTHLY.** James R. Osgood & Co., Publishers, Boston, Mass.

The July number is just out, and its list of contents is varied, and indicative of its sustaining its past popularity.

**AMERICAN EDUCATIONAL MONTHLY.** J. W. Schermerhorn & Co., Publishers, 14 Bond street, New York.

A magazine of popular instruction and literature; a magazine of special interest to teachers. \$2.00 per annum.

**VENTILATION OF THE CAPITOL.**

Hon. T. A. Jenckes will please accept our thanks for a copy of the Report of the Joint Select Committee on the above subject.

We are in receipt of the Second Annual Report of the Bureau of Statistics of Labor of Massachusetts; embracing the account of its operations and inquiries from March 1, 1870, to March 1, 1871. Boston: Wright & Potter, State Printers. It is an important and valuable document.

No. 5 of the *Workshop*, published by E. Steiger, 22 and 24 Frankfort street New York, is one of the best of this excellent repository of design we have seen. Besides the usual collection of rich designs, it contains an excellent article, "Heliography as a branch of Art Industry," which alone is worth the price of the number.

**Queries.**

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers.]

1.—**CRUDE TARTAR.**—Having some crude tartar, I would like to know the best way to clarify it.—McA.

2.—**BALLOON VARNISH.**—What is the best varnish for a silk balloon? How obtained or prepared and applied?—H. W.

3.—**STENCILLING.**—I want a solution, say of rubber, for instance, that can be stencilled on hard metal and will not rub off easily, but will present a hard surface when dry, and dry quickly, yet can be got off easily, say by soaking in water or an alkali for a short time. I suppose it will have to be rather thick and not runny, for stencilling.—P. H.

4.—**BOILER PIT.**—I have a boiler pit, six feet deep, sides and bottom of which are brick, laid in cement. In rainy season it lets in water badly. Can I plaster or paint it with anything to make it water proof, and thus save the labor of pumping?—E. H. H.

5.—**CONE PULLEYS.**—I want a rule for constructing cone pulleys, so that one length of belt will fit each pair on the cones.—H. G. L. & A. W.

6.—**PLEASURE BOAT.**—I want a rule for shaping or drafting a pattern for the knees of a small pleasure boat.—C. D. M.

7.—**BEVEL GEARING.**—What is the best mode to gear and ungear a bevel pinion on top of a shaft turning a horizontal drum shaft, and having a drum below the pinion, the driven shaft being perpendicular? I wish to alternate and run first one and then the other. Can it be done without stopping the shaft? and how?—W. McW.

8.—**CHESTNUT AND HEMLOCK TIMBER.**—In this village, on a contract for chestnut scantling of good quality, for stringers or bed timbers for sidewalks, at double the price of sound hemlock, the trustees accepted and used worm-eaten timber, which has given dissatisfaction and rise to the question of the comparative durability of such timber with young, thrifty timber or with sound hemlock. It is obvious that a correct solution to the question is of much importance to multitudes who have occasion to use timber for posts, stakes, stringers, ties, etc. Will those in possession of facts obtained from observation or practical and experimental tests, please answer?—A. H.

9.—**COPYING INK.**—How can copying ink be made which will leave a copy of writing on copying paper, without dampening the paper, the use of press, or blurring the original, but by simply passing the hand over the copying paper, beneath which the writing shall have been placed?

10.—**BENZOLE.**—Will some of your numerous readers be kind enough to inform me how I can separate benzole from the light oil of distilled coal tar?—E. F. E.

11.—**FILLING FOR ICE BOX.**—Is saw dust a good thing to fill in a small ice box with? or would it be better to leave the space entirely empty?—S. F. M.

12.—**SHELLAC VARNISH.**—Does it improve shellac varnish to put resin into it?—W. F. W.

13.—**PINE TAR.**—Will some of your readers give me the analysis of pine tar, and tell me what effect the steam or smoke arising from it will have upon the lungs, or on catarrh in the head?—L. F.

14.—**KEEPING FLIES FROM HORSES.**—How can this be done without nets?—F. N. P.

15.—**IMPRESSION PAPER.**—Please inform me how to make black impression paper, such as telegraphers use in making several copies of a message or report at one writing. I have made several lots of it by smearing thin, tough paper with lampblack mixed with butter or lard oil. It answers tolerably well for four or five impressions at one time, but it does not keep moist very long, and the color is not as black as that used by telegraphers.—J. D. E.

16.—**ELECTRIC LIGHT.**—I am a photographer, and feel a desire to learn more of this subject; I therefore make bold to request your answers to the following questions: 1. How large a number of cells of Grove's battery would be required to produce a light equal to the oxyhydrogen lime light? 2. Are the carbon points common charcoal? 3. Are the points connected directly with the two poles of the battery, or must the current first pass through a helix or some other arrangement? 4. Is there any special difficulty, aside from the automatic adjustment of the points, in arranging them so as to produce a good light with a sufficiently strong battery? 5. Is there an electric lamp in the market? If so, where can it be obtained?—W. R. B.

**Full Files of this Paper**

Can be found in New York, at the office of Geo. P. Rowell & Co., Advertising Agents, No. 40 Park Row.

**Examples for the Ladies.**

Mrs. Mary R. Hubbard, Troy, N. Y., earned, with a Wheeler & Wilson, in 1868, \$731.47; stitching 31,092 shirt fronts, equal to 886,123 feet of seam. At 20 stitches to the inch, this would give 212,669,230 stitches, an average of 708,891 per day, 89,612 per hour, and 1,477 per minute, or sixty times as fast as hand sewing. Sixty years in one! Her machine has run three years by steam and three by foot power, without repair, and is as good as when bought.

In the recent severe fire in Waverly, N. Y., during which nearly the entire town was burned, one of Marvin's Safes had a severe test, as evidenced by a letter they have just received from there:

WAVERLY, June 19, 1871.  
Messrs. MARVIN & Co.—Gentlemen: I have just had the misfortune of losing my tannery by fire, and, among other losses, one of your very valuable safes. It withstood the most severe test, having remained in one position through the whole fire, and five cords of hemlock bark burned around it, heating it to an intense red heat. Upon opening the safe after the fire, I am happy to inform you that my papers and everything inside were in a perfect state of preservation. Even the wood work was left perfect.  
Yours very truly,  
A. B. PHILLIPS.