

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 87 PARK ROW, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy one year postage included. \$3 20
One copy, six months, postage included. 1 60

Clubs.—One extra copy of THE SCIENTIFIC AMERICAN will be supplied gratis for every club of five subscribers at \$3.20 each; additional copies at same proportionate rate. Postage prepaid.

Remit by postal order. Address

MUNN & CO., 37 Park Row, New York.

The Scientific American Supplement

Is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, \$5 00 a year, postage paid, to subscribers. Single copies, 19 cents. Sold by all news dealers throughout the country.

Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year postage free, on receipt of seven dollars. Both papers to one address or different addresses as desired.

The safest way to remit is by draft postal order, or registered letter.

Address MUNN & CO., 37 Park Row, N. Y.

Scientific American Export Edition.

The SCIENTIFIC AMERICAN Export Edition is a large and splendid periodical, issued once a month. Each number contains about one hundred large quarto pages, profusely illustrated, embracing: (1.) Most of the plates and pages of the four preceding weekly issues of the SCIENTIFIC AMERICAN, with its splendid engravings and valuable information; (2.) Commercial, trade, and manufacturing announcements of leading houses. Terms for Export Edition, \$5.00 a year, sent prepaid to any part of the world. Single copies 50 cents. Manufacturers and others who desire to secure foreign trade may have large, and handsomely displayed announcements published in this edition at a very moderate cost.

The SCIENTIFIC AMERICAN Export Edition has a large guaranteed circulation in all commercial places throughout the world. Address MUNN & CO., 37 Park Row, New York.

NEW YORK, SATURDAY, FEBRUARY 12, 1881.

Contents.

(Illustrated articles are marked with an asterisk.)

Agricultural inventions.....	105	Launch, steam, Herreshoff*.....	95, 99
Air brake, improved.....	102	Law, patent, progress of.....	96
Aluminum battery.....	101	Machinery and civilization.....	105
American industries.....	101	Magic lantern, novel.....	101
Avenues diagonal, in cities.....	97	Manufacturing in New York city.....	101
Blowpipe work, support for (21).....	105	Mastodon the.....	103
Boiler explosion, mysterious*.....	98	Museum of New South Wales.....	97
Caustic, improved.....	103	Natural history of the Jews.....	97
Chloride of gold, to make.....	101	Navies of Europe.....	104
Cities, diagonal avenues in.....	97	Negroes, white.....	103
Clay, for railroad ballast.....	98	Nitrate of silver, to make.....	101
Cubel and nickel, separation of.....	103	Oil wells, Cape Breton.....	103
Copper bottoms on ships (24).....	107	Patent funds, surplus.....	96
Crane, steam, locomotive*.....	12	Patent law, progress of.....	96
Cylinder pressure, average of (6).....	106	Patents, decisions relating to.....	100
Decision relating to patents.....	100	Photographic emulsions.....	104
Dry docks, Erie Basin.....	97	Printers' rollers (11).....	106
Dust and fog.....	103	Railway, American, first in Asia.....	97
Employment, novel, of elephants.....	103	Scarlet for felts.....	101
Erie Basin dry docks.....	97	Scientific American, the.....	104
Explosion boiler, mysterious*.....	98	Ships of war, progress in.....	103
Funds, patent, surplus.....	96	Smoke beneficial effects of.....	103
Furnace, air supply to (5).....	106	Steamboat, iron, large.....	105
Glass stopper, extract a broken (4).....	106	Steamers, repair, out of dry dock.....	105
Gold mining, subaqueous.....	97	Steam expansion of.....	97
He met cress*.....	103	Steam launch, Herreshoff*.....	95, 99
Herreshoff steam launch, etc.*.....	95, 99	Stones, clinging to ice.....	97
Industries, American*.....	99	Telescope, the Lick Observatory.....	97
Inventions, agricultural.....	105	Transfer paper (13).....	106
Inventions, miscellaneous.....	101	Tree root museum, Smith's.....	103
Inventions, new.....	100	Watson's (Professor) successor.....	97
Inventions, recent.....	102	White negroes.....	106
Invisible ink (17).....	105	Wood, to deeproot (3).....	106
Jews, natural history of the.....	97	Wooden trays, varnish for (28).....	107

TABLE OF CONTENTS OF

THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 267.

For the Week ending February 12, 1881.

Price 10 cents. For sale by all newsdealers.

	PAGE
I. ENGINEERING AND MECHANICS —The Egyptian Obelisk in America. 7 figures.—Showing the progress of the obelisk from Alexandria to Central Park.....	4247
Hodson's Rotary Engine. 1 figure.....	4249
Improved Rotary Valve Gear. 4 figures.....	4249
Improved Lubricator. 1 figure.....	4249
Proposed New Bridge over the Douro. 10 figures. Designs submitted to the bridge commission at Oporto.....	4250
Perspective Carriage Draughting. By ADOLPHUS MULLER. 1 figure.—Extension top phaeton to scale.....	4251
The Driving of Nails.....	4251
Brewing in Austria. 8 figures. Austrian brewery plant.—Details, elevation, and section, machinery, etc.....	4252
Josiah Timmis Smith, C.E., Manager of the Barrow Hematite Steel Works.—The improvements in the working of steel introduced at Barrow.....	4257
II. ARCHITECTURE, ART, ETC. —Artists' Homes. No. 9.—Mr. S. Luke Filde's house and studio, Holland Park, Kensington. Full page illustration and 8 figures, plans, elevations, and sections.....	4256
Carved Pedestal Library Table in Italian Walnut with Marquetry in Three Colors. 1 large illustration.....	4256
A Military Tournament.—Sword versus Lance.—Full page illustration.—Drawing by John Charlton.....	4258
III. GEOGRAPHY, ASTRONOMY, ETC. —Pike's Peak a Volcano.....	4259
Climatic Changes in Asia.....	4259
Limit of Planetary Stability. By Prof. DANIEL KIRKWOOD. The Earth and the Moon.—The Martian System.—Other Secondary Systems.....	4261
Pandermite A New Boracic Mineral. By C. G. WARFORD.....	4262
IV. ELECTRICITY, ETC. —A New Electric Motor. By WILLIAM WOODNUT GRISCOM.....	4260
An Essay on the Natural Enemies of the Telephone. By T. D. LOCKWOOD.....	4260
Combined Induction Machine.....	4261
Spiral Polarization.....	4261
V. TECHNOLOGY, ETC. —The Bethnal Green Museum, London. By F. T. ASSHMAN.....	4256
Reversal of the Image on Gelatino-Bromide Plates.....	4257
VI. NATURAL HISTORY, ETC. —The Native Silks of Assam. By C. G. WARFORD LOCK.....	4253
The Natural History of the Jews.....	4262

PROGRESS OF PATENT LAW.

A prominent subject in the decisions recently reported is the degree of "invention" needful to support a patent. Patents must be new and useful; the rule is elementary; yet it does not seem—if one may judge from the number of cases in the courts—to be generally understood. The case of the whip tip patent is a striking illustration, for the reason that the invention, so to call it, was really useful, and the judge in deciding against it, said that he was sorry to do so, as the inventor had introduced a real improvement in the trade. This inventor had observed that driving whips, especially long ones without a lash, were expensive because they soon became frayed or broken at the tip end; while the stock remained good, the whole was worthless for defect of the tip. His device for relieving this difficulty was to make whip tips independent of stocks, so that they might be replaced when worn out. Each tip had a socket, which might be fitted to the small end of the stock very much as the successive lengths of a fishing rod are inserted one within another, except that he cut a screw thread on the inside of the socket of the tip, corresponding to one outside the end of the stock, by which the two might be held firmly together. A patent was obtained; but soon a rival began selling whip tips so contrived as to be clinched to the ferule of the stock instead of being screwed. There was a law suit; and the court decided that the claim of exclusive right to make independent tips could not be maintained because it was not new. Fishing rods have been made for years upon the same principle. To be sure they have not been screwed together, and the patentee of the whip tips was pronounced entitled to his screw. But the competing company was not using a screw; therefore it was allowed to continue the business.

A more recent case is that of the "perfection window cleaner." The description of it is long and complex; but the device was substantially a rubber mounted upon a long handle, adapted to be used in reaching up to clean window panes and other glass surfaces. It consisted only in the adjustment of the rubber strip, supported by a tubular cushion, in a way to bring it advantageously against the surface to be cleaned. The decision of the court was that there was nothing new in the invention; the implement was nothing but a mop or scrubbing brush made of India-rubber.

A still more remarkable case was decided upon a patent for "improved kindling wood." In order to make kindling wood take fire easily and save the kitchen maids the trouble of cutting splinters and shavings, or of hunting for waste paper to set it alight, this inventor proposed to sell the wood in small bundles, in each of which should be tied a little lump of resin, tar, or some combustible of that sort, which would take fire from a common match, and set fire to the bundle. For this he obtained a patent, but the court said that there was no invention; his device was no more than selling tar or resin tied up in a bundle with kindling wood. It was no more patentable than would be selling a cigar with a match tied to it, or a drinking glass with a straw, or a can of food with a fork.

City readers are familiar with the fare boxes used in omnibuses, and in the street cars running unaccompanied by conductors. They are so arranged that a passenger may drop the coin for his fare into a sort of savings bank slit at the top of the apparatus, through which the coin will fall down upon a little movable shelf—what one might perhaps call a diaphragm—where it lies until the driver has inspected it to see that it is a genuine coin, is for the proper amount, etc. He then pulls a lever, which lets the shelf drop, and the coin falls into the company's savings bank below. Obviously the device requires a window for the driver to look through. Fare boxes as thus described have been in use for some time. Patents were more recently taken out for two improvements. One of these consisted in fitting a second window to the rear side of the apparatus; and the other consisted in arranging a reflector in the interior of the box, so that the headlight of the car might shine down and enable the coins to be seen conveniently at night. The Circuit Court has decided against the validity of both these claims. Inserting the additional window is nothing new; the old form of the box included one window, so that the improvement consisted merely in duplicating one of the features of a former device. This is not "invention;" nor is any invention involved in arranging a reflector near a lamp in such a manner as to cast light into a fare box near by it.

Seats for chairs, settees, railroad cars, ferryboat cabins, etc., are nowadays extensively made of veneers, or thin sheets of wood perforated. Strength is gained for the thin wood by gluing one sheet upon another crosswise, and the perforations, being arranged upon some simple design, give both ventilation and ornament. A patent was taken out for this mode of construction; but when it was contested, proof was produced of an earlier patent for gluing veneers together across their grains to make a thin, strong sheet; and also of another earlier patent for perforating sheet metal for making chair bottoms. The Circuit Court then said that the more recent patent for veneers glued together and perforated displayed no invention, and was void.

In two law suits which arose upon the patent for the giant powder, it became necessary to consider the question, How full and precise must be the description of a device in an earlier patent in order to forbid one who invents it anew at a later date from obtaining a valid patent? Judge Blatchford has stated the rule to be that the description in the prior patent must be sufficient to show with certainty how, by following its directions, the article can be made, and

this must be a result within the intention of the description, not a mere accident. Showing that by following the directions of an earlier patent, a person might accidentally, through small variations in the process, have hit upon the same result, does not avoid a patent which has been granted to a subsequent inventor.

A noteworthy decision in this branch of the law, in which the patentee was more successful than in the preceding cases, relates to an improvement in water works for cities. Former devices for this purpose have been subject to the defect that the pressure of water from reservoirs, or from force pumps where they were employed, upon hydrants or spigots, was inconveniently variable; sometimes it would be deficient, and then so excessive as to burst the apparatus. The inventor devised pumping machinery so contrived that as fast as the pumps increased the quantity of water in the mains, and so increased the pressure upon the hydrants or spigots, the increased pressure should diminish the action of the pumps automatically; or, afterward, when the flow of water from use diminished the pressure, the diminution should set the pumps at work again more vigorously. The invention has been quite widely adopted. Recently the patentee's priority has been contested, and several English and American contrivances, having the same general purpose, have been brought forward for comparison, but the Circuit Court, after examining them in detail, pronounced them all substantially different and inferior, and sustained the patent.

THE SURPLUS PATENT FUNDS.

In 1868 Congress passed a law requiring the daily receipts of the Patent Office to be deposited in the Treasury, the support of the office to be provided for by annual appropriations from the patent fund. During recent years, under a pretext of economy, the appropriations for the conduct of the Patent Office have been unduly cut down, greatly to the disadvantage of the service, while the surplus fees have accumulated until they now amount to over sixteen hundred thousand dollars. In other words, the inventors of the country have paid in fees to the office, during the past ten or twelve years, this large sum in excess of the cost of the service rendered by the office.

There has naturally arisen the question, What shall be done with these surplus funds?

It is obvious that the most that can be asked of any branch of the public service is that it shall accomplish efficiently and fully the work intended by it. If the fees paid for service by those who are served amount to enough to pay the cost of such efficient service, that is so much more to its credit, and the utmost that can be justly demanded of it has been secured. The only department of the public service which stands in this unique position is the Patent Office. It has been and is self-supporting—and more.

If in doing this it has also done its legitimate work with the highest degree of efficiency justice to the clients of the office, the patentees, demands that the fees should be cut down so as to cover the cost of the service, and no more. If the office has been prevented, through insufficient appropriations, from doing its work as well as it might, and this is plainly the case, the only alternative is to use the surplus fees for the immediate improvement of the service.

Any diversion of the surplus funds to other uses—as proposed in the bill lately passed by the Senate and now pending in the House, transferring the surplus funds of the Patent Office to an educational fund—is equivalent to laying a special tax upon inventors, which is certainly neither fair nor politic.

If the excess of fees cannot be used for the improvement of the Patent Service, there should be no excess of fees. Indeed, justice to our inventors, and a wise national policy looking to the advancement of the useful arts and sciences through the encouragement of invention, plainly indicate two things to be done in this connection:

1st. The passage of Mr. Vance's bill to reduce the fees on patents and caveats, or something like it; and

2d. The employment of the surplus fund now accumulated to improve the working facilities of the Patent Office. The office needs more room to work in; its library should be extended and classified as to matter and thoroughly indexed; a critical digest of the patents that have been issued should be made for the convenience of the public as well as that of the office; and all the patents issued before 1866 should be printed and made accessible to students and inventors at reasonable cost. This done, it is quite possible that the fees named in Mr. Vance's bill would suffice to cover the running expenses of the office with an efficiency of service impossible now, and still less possible should the office have to submit to a diminished income without the improved facilities which a proper use of the surplus funds would secure.

Burnt Clay for Railroad Ballasting.

The Chicago, Burlington, and Quincy Railroad Company are burning clay for ballasting their road. A small fire of bituminous Iowa coal is started on the surface of the ground, and, when burning freely, the fire is covered with a layer of lumpy clay, then alternately coal and clay, the coal decreasing in quantity until at the top it is as one to fifteen. The mass is formed like a cone. Three united cones, each 18 feet high and containing in all about 1,000 cubic yards of material, have been started near Red Oak. They will burn for months. Six hundred miles of road are to be ballasted with this crude pottery broken up. It resembles coal cin-der, but is harder.