

## Discoveries in Pompeii.

The excavations at Pompeii are a continual source of interest. The new system of conservation inaugurated this year makes them doubly important. The last mansion unearthed in the buried city, whose history every one now knows so well (or ought to know), has been made the test of these improved methods instituted by the able and excellent directors. Instead of hiding away the statues, pictures, and other movable objects in the Naples Museum, as has previously been the custom, everything has been left in situ, and many objects sufficiently restored to give an idea of their original appearance. The excavation may be said to have begun in August of 1894; but the weather and lack of funds retarded the work. In November the atrium was reached; but during the winter the work progressed slowly, and the last rooms were not unearthed till June, 1895, the labors of restoration, cleaning, and preservation not being completed till August, exactly a year from the date when the first layer of earth was removed. The main entrance of the house leads into a street still blocked up with rapilli; it consists of an ostium, or passage, on one side of which sat the janitor, his little division being separated by a partition of wood that has disappeared. Facing his seat is a semi-"religious" picture, only suitable to that barbarous period of Europe's history, and which has now very properly been covered over. There were two great doors in this passage. On the outer wall of the house can be seen the remains of the iron hinge and staple that held the bar across the outer door when the house was locked up and the family had deserted it.

The room on the left of the ostium contains two small and ordinary pictures of the stereotyped kind: one represents Leander swimming across the Hellespont to Hero; the other Perseus in his ship deserting Ariadne. . . . On the opposite wall is a picture of Cephalus and his devoted wife Procris, in the form of a wounded deer, the latter being probably also represented by the woman high in the left of the same painting gazing earnestly at her husband. These pictures are let into the wall, and the prepared stucco on which they were painted was probably first laid on a board, to afford greater facility to the artist, and then, when it had dried, was inserted in the space prepared for it in the stucco on the wall's surface; the brown, yellow, or sometimes black band of paint that usually borders them hides the joining line. In the frieze is seen Leda and the swan, a bacchant with a thyrsus and a bacchante with a tamboreen, while two

centaurs appear on the tops of this delicate painting. The garlands painted on the white wall, the architectural studies capped with winged sphinxes, and the cornices of red, white, and blue mouldings above and below the frieze, and separating it from the curve of the arched ceiling, add immensely to the appearance of the colors; and this elaborately painted apartment is the more attractive by the amount of brilliant red cinnabar that has been used in its decoration, and that adds considerably to the splendor of the effect.

Beyond this room, at the side of the atrium, is a side passage leading through the kitchen into the little street named by Fiorelli the Vicolo di Mercurio; in it is a staircase. Near its entrance in the atrium are the remnants of a safe, once built and riveted on a foundation of heavy stones. The iron parts are original, but the case of wood on which they are fastened is modern. Near this safe were found a bronze ring and two seals, both of iron, which are preserved in the house of the Administration of Pompeii preparatory to going to the Naples or the local museum. On one of the latter is "A. VETTI. RES. V.," and from this the house is to be called the "Casa di Vetti." On the opposite side of the atrium is another and larger safe, likewise restored. Both safes bear evidence of having been broken to pieces either by those who had dug their way down into the house, or perhaps by thieves under cover of darkness on the very night itself of the destruction of the city, when the mountain's awakened "voice at intervals" was heard roaring "through those roofless halls," and

Temple and tower went down and left a site:  
Chaos of ruins!

A delicate little gold chain, with pearls and a few coins, besides a bronze seal with the name "P. CRVSTI. FAVSTI," were found in the highest level of earth over the rooms on the right of the atrium; but these objects may have belonged to the owner of another house, and not to the proprietor of the safes. Close to the larger of these latter is the entrance to an irregular shaped room, that contains a lararium, or altar. It stands out from the wall about eight inches, and on its sides rise two columns; between them, painted on the back of the niche sunk in the wall, is the usual picture of the two Penates or genii, and a female between them who represents either the Lar or, as some suppose, Vesta; at their feet is the tutelary genius in the form of a serpent, which is the symbol of regeneration, or of new life, accepting the offering of fruit

placed before him on a small altar. The colors are wonderfully fresh, the tints are principally red, brown and yellow.

When the garden in the marble-decked peristylum is again green with shrubs, and its beds continually stocked with gay and sweet-scented flowers, the mansion will assume (except in its protecting roofs) an aspect as if the inhabitants had only just deserted it, and the earthquake had only lately taken place.—H. P. Fitzgerald Marriott, in the English Illustrated Magazine.

## A Lighthouse at Cape Hatteras.

Work on the Diamond Shoal lighthouse, off Cape Hatteras, is to be begun next spring. The new plans contemplate an immense structure, built on the screw pile order, with the foundation of the light practically 100 feet beneath the wave surface and protected on all sides by hundreds of tons of riprap to prevent damage from shifting sands. Iron piles will be driven down by hydraulic pressure until a sound footing is secured, and the actual structure for the lightkeepers and materials to maintain the light will be built on the interior of the skeleton to a height of 165 feet above the water. The cost of the structure when completed is estimated at \$1,200,000, and of this sum there is now available \$400,000. Diamond Shoal projects into the sea seven miles off Hatteras, and is covered with from 6 to 20 feet of water. It is marked now only by Hatteras light, standing on shore seven miles from the outer edge, and not discernible in hazy or foggy weather. The proposed light will be on the extreme edge, seven miles from the nearest shore, and visible twenty-three nautical miles. The latest fog apparatus will be provided, and there will be accommodation for three keepers. It will probably take two years to complete the project from the date the work begins. When completed it will be the most notable lighthouse in the world.—Army and Navy Journal.

The Lancet announces that a subscription has been opened in Bristol to provide for the purchase and retention in that city of the celebrated collection of relics belonging to Jenner in connection with his introduction of vaccination. The collection is at present the property of Mr. Frederick Nockler, of Wotton-under-Edge, and was exhibited by him at the Bristol Exhibition in 1893, and since then in London, at each of which places it attracted a considerable amount of attention.

## RECENTLY PATENTED INVENTIONS.

## Railway Appliances.

**CAR FENDER.**—Charles A. L. du Quesnay, New Orleans, La. A frame secured to the front end of a car carries an inclined pivoted netted fender, the fender being curved upward at its rear end to form a protecting pillow. A spring-controlled front strand of the fender is adapted to yield inwardly, when a person is caught in the path of the moving car, and when one falls on the fender it is tilted and its front end raised to lift the feet from the ground, the head and shoulders being protected by the pillow.

**CAR BRAKE.**—George E. Wheeler, Minneapolis, Minn. This is a brake more especially adapted for use on street cars, requiring but little effort on the part of the motorman or gripman, and not interfering with the ordinary brake, which may be left on the car for use in case of accident. The improvement comprises a fixed and a loosely mounted bevel faced wheel on the axle in proximity to each other, and both adapted to be engaged by a conical friction wheel on a shaft connected with a hand lever extending upward through the car platform.

**CAR OR VEHICLE DRAUGHT DEVICE.**—James H. Turbush, New York City. This improvement provides conveniently attachable supports for the inward and outward thrust of the drawbars, the supports being rigid and constituting travelers upon which the followers may have movement, while relieving the confining strap or tie for the springs from the strain they ordinarily sustain.

**CAR DOOR.**—Thomas W. Bradman and Harrison Hines, Beardstown, Ill. This is a sliding exterior freight car door, on the upper part of which are hangers adapted to move upon a track, and the door is adapted to be locked in closed position by means of three bolts actuated from a central disk, the bolts being moved outward into suitable keepers at the top and two sides of the door by a crank, when a seal finger may be conveniently applied. The door is easily opened and closed, and is designed to afford effective protection to property in cars on which it is employed.

**RAILWAY RAIL NUT LOCK.**—Green Smith, Montgomery, West Va. This device has a base plate that may be extended or adjusted longitudinally to bring its bolt apertures into alignment with the rail and fish plate aperture, a ratchet washer having a recessed outer face receiving the adjacent face of the nut to be locked. The ratchet washers having nut receiving recesses, the improvement may be applied to any bolts and nuts now in use on railroads, or the ratchet teeth may be formed directly on the nuts where they are to be supplied with the other parts.

## Miscellaneous.

**BICYCLE.**—Samuel A. Donnelly, Chicago, Ill. This is an improvement on a formerly patented invention of the same inventor, and the box or casing for the bearings consists of two parts, each having a radial

lug and opposite turned lip receiving and engaging the lip of the other part. An improved diamond frame also has upper and lower bifurcated truss members, each formed of a single rod doubled at its middle, the head having arms with sockets to receive the doubled ends of the members, while the saddle block, at the angle of the upper member, has angular grooves to receive the member, there being straight transverse stay rods whose upper ends enter sockets in the block, and a bolt which clamps the block to the parts in contact with it.

**PROPULSION OF VESSELS.**—James H. Meacham, Petersburg, Va. An endless band propeller, patented by this inventor, comprises sprocket wheels at some distance apart on each side of the vessel, the sprocket chains or bands of steel, copper, or other metal with suitable tenacity and flexibility, carrying the buckets or paddles. To avoid undue strain upon the bands, the wheels are polygonal, but are rounded instead of presenting true angles, and the paddles may be feathered.

**VENDING MACHINE.**—Charles W. Goldsmith, New York City. This is a coin-controlled apparatus especially adapted for delivering bulky packages, and has two pairs of oppositely arranged supports movable toward and from each other, and capable of supporting alternately crossed elongated packages, each pair of supports alternately dropping a single package for delivery. The coinway is of the usual construction, and coins cannot be inserted when the merchandise has been exhausted.

**DENTAL FILLINGS.**—James W. Dennis, Cincinnati, Ohio. An absorbent of mercury during the process of filling teeth with amalgam has been provided by this inventor, consisting of rubber saturated with comminuted metal having an affinity for amalgam, the material thus formed being apertured, whereby a maximum of metallic surface will be presented to the amalgam filling. The material may be made into pads or plugs of a size or shape to enter a tooth cavity, and thus facilitate making non-shrinkable metallic fillings by absorbing the surplus or loose amalgam.

**LOCK.**—Lewis O. Wilson, Charleston, West Va. This is an improvement in knob locks, providing a lock more easily applied to doors by simply boring a hole instead of mortising in its edge, the lock being capable of being unlocked only from the inside. The lock has a slotted cylindrical barrel in which is a spring-acting bolt with a hole, in which is arranged a retracting bar whose end extends into a slot in a frame plate on the outside of the door. A knob shaft with crank also receives the end of the retracting bar.

**PHOTOGRAPH PRINTING FRAMES.**—Allen E. Willis, Oxford, N. C. An automatic register for keeping tally of the number of prints in the frame has been devised by this inventor, the improvement permitting the examining of prints without disturbing the register and the proper setting of the register in case a print is spoiled. A toothed bar is mounted to slide in guideways on the print-holding back, a pawl engaging the bar, while a spring-pressed cam arm connected with the pawl is adapted to be engaged by the frame.

**HAME FASTENER.**—Joel P. McAhee, Erie, Ala. A connecting bar pivotally connected with

one of the hame sections, according to this improvement, has a latch extension and head, while a keeper pivotally connected with the opposing section has recesses to receive the latch extension and a locking device. The improvement is especially adapted for hames having iron bands, the fastening device facilitating the connecting of the two members of the hames at the bottom around the collar and the necessary adjustment to fit any size of collar.

**SLEIGH BRAKE.**—Adelbert Meacham, Edinburg, North Dakota. This is an improvement on a formerly patented invention of the same inventor, providing means whereby the brakes may be strengthened and the drag bar readily lifted from the ground when it is necessary to back the sleigh. A brake bar is employed for each runner, terminating in a shoe as wide and strong as desired, and the brakes are automatically applied when the team backs, as in going down hill, the braking engagement being removed when the team pulls forwardly. In going up hill the drag bar enters the surface when the team stops.

**HOSE NOZZLE.**—John M. and Albert W. Dosch, Kittanning, Pa. This nozzle is forked, one of the members carrying an adjustable yoke in which is a cone, there being a three-way cock in the nozzle at the junction of its members, the nozzle being adapted for either garden or fire purposes, and providing for bringing into action instantly either a solid or a spray stream. The spray is thrown out in conical form, covering a large area, and may be conveniently made either coarse or fine.

**POCKET KNIFE.**—William Schmachtenberg, New York City. This is a knife in which the blades may be opened without using the finger nails, a lever fulcrumed inside the handle engaging the knife blade near its fulcrum end to swing the blade to partly open position, and this lever being moved by the shank of a button on the outside of the handle. There is a similar lever for each blade in opposite sides of the handle, a spring in the back of the knife holding the blade open or closed as usual.

**SELF-CLOSING LACING HOOK.**—La Roy S. Upton, Governor's Island, N. Y. This is an article adapted especially for use on shoes or gloves, and the hook is composed of two parts, a fixed base seated in the leather and having at one side a vertical arm or hook, another movable part being a lower swinging arm pivoted to the base arm and normally closing the open side of the hook. By drawing the string outwardly or laterally against the movable arm it is opened and the string disengaged, while by passing the string laterally between the open arms and drawing it taut, its re-engagement is automatically effected.

## Designs.

**SCARF RACK.**—Homer E. Eymann, Lancaster, Ohio. This rack has convergent ornamental holders adapted to retain a number of scarfs, rising from a circular base and presenting convergent openings.

**TABLE CLOTH FASTENER.**—Theodore R. Desjardins, Attleborough, Mass. This is a corner

piece with scalloped shell-like top portion and two spring side and bottom members for holding a table cloth in position on a table.

**INSCRIPTION PLATE.**—Edward K. Jones, Portland, Oregon. This is a plate to be applied to sidewalks at street corners, to receive street names, advertisements, etc., the plate having a straight back edge and a wave-like curved front edge.

**NOTE.**—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

## NEW BOOKS AND PUBLICATIONS.

**ELEMENTS OF MODERN CHEMISTRY.** By Charles Adolphe Wurtz. Fifth American edition. Revised and enlarged by Win. H. Greene, M.D., and Harry F. Keller, Ph.S. (Strasburg). With portrait of the author and numerous illustrations. Philadelphia and London: J. B. Lippincott Company. 1895. Pp. 808. Price \$2.50.

Wurtz's modern chemistry is so well known and enjoys so wide a popularity that it really requires no review. Sixteen years ago the first translation was given to the American public by one of the editors of the present work. The book is now thoroughly re-edited and presents a very acceptable treatise on the science, including, we are glad to see, both argon and helium.

**PRACTICAL PROOFS OF CHEMICAL LAWS.** A Course of Experiments upon the Combining Proportions of the Chemical Elements. By Vaughan Cornish. London and New York: Longmans, Green & Company. 1895. Pp. xii, 92. Price 75 cents. No index.

It is an open question how far the study of chemistry can be treated inductively. It certainly seems that the student has a right to accept the work of the world of chemists, and that he should not be obliged to obtain for himself proof of many known chemical laws. But this little manual really gives an inductive treatment of a small portion of chemistry, only enough to show how the laws can be and have been proved. We note in the preface that the work has been done by pupils from twelve to eighteen years of age, spending one and a half hours at a time in the laboratory, with two weekly attendances. We certainly think the amount of inductive research given in this manual could properly and advantageously be performed by all chemical students. The work is destitute of an index.

**AMERICAN ANNUAL OF PHOTOGRAPHY AND PHOTOGRAPHIC TIMES ALMANAC FOR 1896.** Edited by Walter E. Woodbury. New York: Scovill & Adams Company. Pp. 370. Price 75 cents.

There can be no question but that this annual has come to occupy a leading position among publications of its character in the United States. The volume for 1896

is replete with two hundred illustrations, many of which are reproductions of the best work by prominent amateur and professional photographers.

THE WONDERS OF MODERN MECHANISM. A Resume of Recent Progress in Mechanical, Physical and Engineering Science.

In this work we find presented in popular form the achievements of engineers in the many departments of science, such as building, manufacture of steel, electricity, artificial refrigerating and similar topics.

The Scientific African.—The Scientific African is the name of a new journal, the first copy of which has just been received.

SCIENTIFIC AMERICAN BUILDING EDITION.

JANUARY, 1896.—(No. 123.)

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- 1. A residence at Orange, N. J. Two perspective elevations and floor plans, also an interior view. Approximate cost \$12,000. Mr. Frank W. Beall, Chicago, Ill., architect.

The Scientific American Building Edition is issued monthly. \$2.50 a year. Single copies, 25 cents.

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Whereas the said copartnership had business relations with foreign countries and transacted business in the State of New York for a period of five years and upward; and

Whereas, I, Orson D. Munn, the surviving copartner, am desirous to continue the business conducted by the said copartnership and to continue the use of the name of Munn & Co.

Now, I, Orson D. Munn, do hereby certify and declare that I am the person dealing under such name of Munn & Co., and that my place of abode is 14 East Twenty-second Street, City of New York, and that my principal place of business is at No. 361 Broadway, in the City and State of New York.

(Signed) ORSON D. MUNN. [L.S.] In presence of A. A. HOPKINS.

On this 6th day of January, in the year 1896, before me personally came Orson D. Munn, to me known to be the individual described in and who executed the foregoing instrument and acknowledged to me that he executed the same for the purposes therein mentioned.

(Signed) A. A. HOPKINS, [L.S.] Notary Public, Kings County, New York.

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Notes & Queries

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References to former articles or answers should give date of paper and page or number of question.

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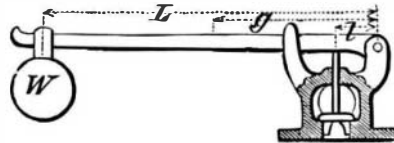
(6711) F. W. B. asks for directions for making an ever-ready pad for rubber stamps.

(6712) F. W. writes: I would like to ask a few questions concerning an acetylene gas plant arranged on the principle of the one described on page 8 of the Scientific American of January 4, 1896.

How large would generator bottle and receiver have to be to supply two jets that have been used for coal gas (ordinary dwelling house size).

(6713) G. H. DeL. asks: 1. On a 500 volt street railway circuit, how much current does any one car take at full load? A. At 50 horse power 75 amperes could be taken.

(6714) R. N. T. says: Will you give me formulas for computing the elements of a safety valve?



A. Let W = the weight. L = distance between center of weight and fulcrum in inches.

When the weight is at hand and known, and the distance is required, then

W = { (P x A) - (V + (w x g) / I) } x L / I

The elements between the brackets to be computed first. To obtain the area of the valve, multiply the square of the diameter by 0.7854.

(6715) D. P. D. says: Please let me know, through the Scientific American, how to put a 1/4 in. hole through a heavy glass bar?

(6716) C. J. M. asks how to make leaf photographs. A. Pass the paper first through a solution of gelatin, 1 part in 20 parts of hot water, and use a strong solution of potassium bichromate.

(6717) G. D. H. says: Can you give me simple rules for calculating the speed of pulleys? A.

The diameter of the driven being given, to find its number of revolutions.

Rule.—Multiply the diameter of the driver by its number of revolutions and divide the product by the diameter of the driven; the quotient will be the number of revolutions of the driven.

Ex.—Twenty-four in. diameter of driver x 150, number of revolutions, = 3,600 ÷ 12 in. diameter of driven = 300.

The diameter and revolutions of the driver being given, to find the diameter of the driven, that shall make any given number of revolutions in the same time.

Rule.—Multiply the diameter of the driver by its number of revolutions, and divide the product by the number of required revolutions of the driven; the quotient will be its diameter.

Ex.—Diameter of driver (as before) 24 in. x revolutions 150 = 3,600. Number of revolutions of driven required = 300. Then 3,600 ÷ 300 = 12 in.

The rules following are but changes of the same, and will readily understood from the foregoing examples:

Rule.—Multiply the diameter of the driven by the number of revolutions you wish to make, and divide the product by the required revolutions of the driver; the quotient will be the size of the driver.

Rule.—Multiply all the diameters of the drivers together and all the diameters of the driven together; divide the drivers by the driven; the answer multiply by the known revolutions of the main shaft.

TO INVENTORS.

An experience of nearly fifty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere.

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