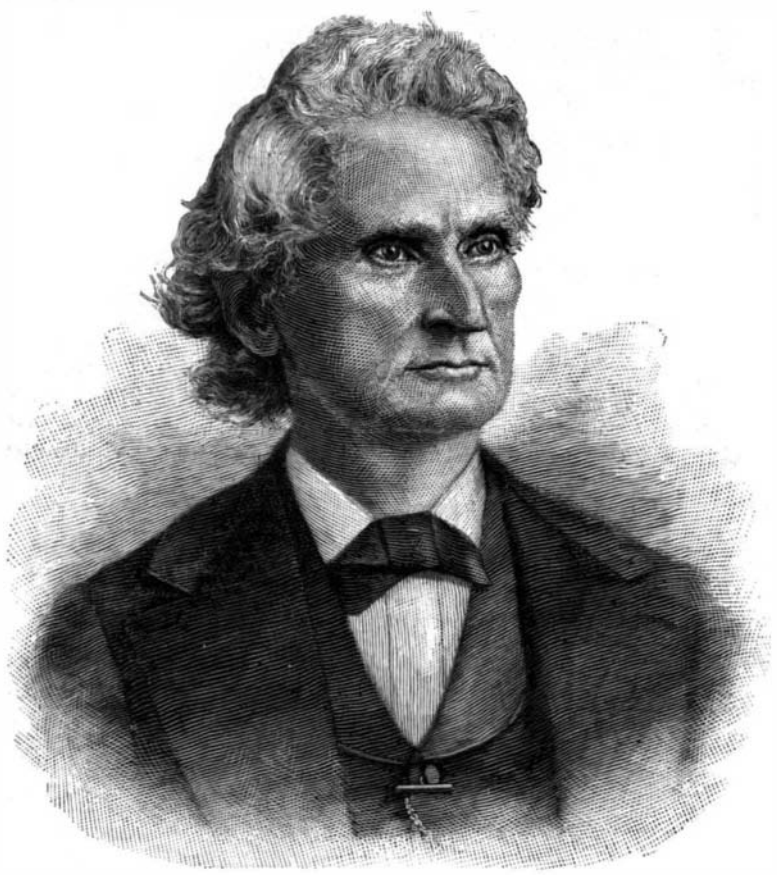
JAMES D. DANA.

In the death of Professor James Dwight Dana, America has lost one of her greatest scientific men.

The celebrated mineralogist and geologist passed away after an illness of only a few hours at his New Haven home on Easter Sunday, April 14, in the eighty-second year of his age. He was born in Utica, February 12, 1813. His early education was obtained at school in his native place. In the autumn of 1830 he entered Yale College and graduated three years later, after which he was appointed professor of mathematics to midshipmen in the United States Navy. In the two years he held this position he visited France, Italy, Greece and Turkey. In 1835 he returned to New Haven and became assistant in chemistry to Prof. Silliman. He was engaged at this time in the preparation of his "Treatise on Mineralogy," the first edition of which was published in 1837. This work was the first of his remarkable writings which were to mark an epoch in the history of natural science. In 1836 he received the appointment of mineralogist and geologist to the exploring expedition sent by the United States to the Southern and Pacific Oceans. The Peacock, on which he sailed, was wrecked at the mouth of the Columbia River. In the three years and ten months which he spent on the trip he visited Madeira, Rio de Janeiro, Terra del Fuego, Valparaiso, Callao, Tahiti, Samoa, Australia, the Hawaiian Islands, the Feejee group, Manila, Borneo, Singapore, Cape of Good Hope, St. Helena and many other places. Besides the mineralogy and geology of the expedition, Mr. Dana had under his supervision the zoological department, including the crustacea and corals. The rare opportunity which this voyage afforded for scientific observation had been well improved, and for thirteen years after his return he was engaged principally in studying the material that he had collected, making drawings and preparing reports for publication. From 1842 to 1844 he lived in Washington. In the latter year he removed to New Haven, where he married Henrietta Frances, third daughter of Prof. Silliman.

In 1850 Mr. Dana was appointed Silliman professor of natural history and geology in Yale College, succeeding his father-in-law, but he did not enter on the active administration of the chair until 1856. The title of the professorship was changed in 1864. Mr. Dana became associate editor of The American Journal of Science and Arts, and after Professor Silliman's death, its senior editor. Contemporaneously with his duties as a lecturer and editor, Prof. Dana prepared his well known text books on mineralogy and geology. His "System of Mineralogy" grew in size from 452 pages in 1837 to the edition of 1892, which contains 1,197 pages. The "Manual of Mineralogy," a more elementary work, has also a deserved popularity. These books, with his "Manual of Geology" and "Text Book of Geology," are recognized as standards throughout the world, and are used as text books and works of reference wherever the sciences of which they treat are taught in the English language. His writings on the coral islands include "Coral Reefs and Islands" (1853) and a second edition of that book which was published in 1872 under the title of "Origin of Coral Reefs and Islands." His separate papers include hundreds of titles. Many honors were paid to Mr. Dana. He received the degrees of Ph.D. and LL.D. The Geographical Society of London conferred on him its Wollaston medal in 1872, and in 1877 he received the Copley gold medal from the Royal Society of London. He was also a member of the chief scientific societies of America and Europe. Prof. Dana retired from active work at Yale two years ago, but has given private lectures and instructions at his home and gave invaluable advice on the subject of geological and zoological matters in the Peabody Museum.



James D. Dana

Rare Metals and Alloys.

A glass case, said to be worth $50,000, was one of the attractions at the London Royal Institution recently. The contents were a variety of globules and cast bricks of unpretending appearance, used to illustrate Professor Roberts-Austen's lecture on the rarer metals and their alloys. A slab of palladium, the largest in the world, was valued alone at $35,000. Professor Moissan in France and Mr. Claude Vautin in England have, by different methods, succeeded in reducing and casting these highly infusible metals, most of which have hitherto been seen only in minute and precious fragments; but whereas M. Moissan with his electric furnace has never succeeded in eliminating carbon from his products, which are, therefore, really carbides, Mr. Vautin, by the ingenious use of finely divided aluminum as a reducing agent, can produce large quantities of almost any one of the metals from their oxides in an absolutely pure condition. The value of these metals, even if they could all be produced commercially on a large scale, is still doubtful, although indications of their usefulness are not wanting. Chromium, for instance, has made a revolution in steel projectiles, while aluminum threatens to become a popular craze. The experiments conducted at Woolwich, under the supervision of the ordnance director, show, moreover, what we may expect from these metals with high fusing points the peculiar power they possess of strengthening other metals.

House Nerves—A Bad Ailment.

Energetic, care-free individuals laugh at the suggestion of such an ailment as house nerves and say it is only imaginary. But thousands of women, says the New York Press, will testify otherwise.

People of sedentary habits, who spend all their time indoors, frequently become morbid, brooding and irritable. The failure of any member of the family to reach home at the usual time brings forth gloomy forebodings of disaster. The absence of any one at night causes floor walking, and tears, even though such person be of mature years, sound health, and abundant ability to care for himself. A projected journey is overcast by recitals of horrible accidents. Meals are unsatisfactory, clothes never fit, no one sympathizes or condoles with the sufferer.

The reasons of house nerves are legion. Introspection is one. Let a woman sit at home day after day, week in and week out, and analysis of everything and person within her ken naturally follows, herself included. A woman who studies herself, her wants and desires, her ailments and loneliness, is on a fair road to an asylum, did she but know it.

Some women, it is true, are tied down by children and household cares to a ceaseless indoor life, but they are not generally the ones who succumb to house nerves, one reason being that, forced out of contact with others, they yearn always for the privilege of mingling in some sort of society, embracing every chance thrown in their way toward that end. But the woman who stays at home because she might get sick by venturing out in the cold or because her neighbor can entertain better than she can or dress better, or perhaps the habit has become fixed by degrees to that extent that it is like parting with a tooth to get out of the routine—this is the woman who broods and fancies and cries over mental pictures of catastrophes that never happen and meets troubles which never come.

Any parent who owns a highly imaginative child owes it to society at large to throw it in with healthy, merry companions, who always effect a complete cure, for mirth is infectious. But if the unhappy owner is repressed and kept indoors, some family in the future will feel the effects.

The cure is simple, but few follow it. Throw away your medicine and go visiting. Patronize all the gayeties that your pocketbook affords. Take long walks in the sunshine, and whenever a morbid thought comes think up a necessary errand, and it will dissolve like mist before the sun. House nerves can be cured, but only by natural laws. Medicines dull, but do not cure.

Protection Against Rust.

In La Revue Scientifique a description is given of Gesner's method of protecting iron and steel against rust. The method consists in forming on the surface of the metal a double carbide of hydrogen and iron, which is extremely hard and adherent. In fact, a bar thus coated can be bent through an angle of 45 degrees without disturbing the layer. In carrying out the process, the articles are thoroughly cleaned from rust, but it is not indispensable to remove all oil or grease. A couple of gas retorts are placed alongside each other and raised to a temperature of from 600 degrees Centigrade to 700 degrees Centigrade. The articles to be treated are then placed in these retorts for about 20 minutes, after which a current of hydrogen is passed through the retorts for 45 minutes. A small quantity of naphtha is then introduced, the supply being maintained for 10 minutes. It is then stopped, the current of hydrogen being kept up 15 minutes longer, when it is stopped and the retorts allowed to cool to 400 degrees Centigrade, and when this temperature is reached the doors can be opened and the finished product removed. The coating thus given has a bluish color.

In a communication to La Societe d'Encouragement, M. Charpy gives the results of a research on the hardening of steel, on which he has been engaged some time. The two points toward which his investigations have mainly been directed are, first, to ascertain what relation there may be between the phenomenon of recalescence and the variation in the mechanical qualities of the metal by bending. In the second place, he wished to determine what was the significance of Osmond's "critical points," a_2 and a_3, which occur in iron at about 745 degrees and 860 degrees, respectively. The metal used was four samples of open hearth steel, having respectively 0·11, 0·35, 0·45 and 0·75 per cent of carbon. Twelve special steels were also specially prepared for the research, making use of extremely pure materials. The first four of these twelve were carbon steels, containing respectively 0·09, 0·06, 0·37 and 0·65 per cent of carbon. Another four samples were of extra soft steel containing in addition about 1 per cent of either chromium, manganese, nickel or tungsten. The remaining four were of a harder steel, having 0·45 per cent of carbon and about 1 per cent of some one of the elements already mentioned. The cooling curves of all these metals have been obtained automatically by the use of photography. After this, specimens of each of the metals enumerated were hardened in oil or water, the experiments being repeated in varying the temperature from which the metal was cooled. For heating the specimens preparatory to this an electric furnace was used, the requisite temperature being obtained by passing a current through a platinum spiral. This plan prevented any risk of contaminating the samples. The temperatures were taken with a Le Chatelier pyrometer. The physical characteristics of the different samples, after tempering, were ascertained by tensile bending tests and drop tests. Briefly stated, the results seem to show that only near 700 degrees Centigrade, the a_1 point, do the properties of the metal, so far as tempering is concerned, undergo a change, being unaffected at the critical points a_2 and a_3. Nevertheless, the change in the metal which occurs at the a_2 point seems to be the same as occurs at the breaking down point in a tensile test, and to also be the critical point so far as magnetic properties are concerned. In every case hardening increased the breaking load, both in tension, compression, and drop tests, but the elongation diminished.

The Useful Donkey.

It seems that Mr. Shepherd has a very rich mine in an almost inaccessible part of the Mexican mountain ranges, a long way removed from any railroad, which he has been equipping at great cost with first-class mechanical appliances. Some time ago Mr. Shepherd concluded that his equipment required 5,000 or 6,000 feet of wire rope for carrier purposes, but how to get it up into his mountain fastness in a single piece, as required, was a question. By no possibility could it be moved from the railroad to final destination on wheels, and he didn't see how it could be carried by burros. But a Mexican did. He explained his plan, got the contract for carrying the 1¼ inch cable, and successfully executed it. Here is the way he did it. He coiled the rope up at fixed distances along its entire length, each coil being of approximately the same size and designed to weigh 300 pounds, and loaded it on a string of burros with proper fastenings. To take up the slack between each two burros, two Mexicans with padded shoulders were inserted and faithfully kept up their end, or rather portion, of the line. The procession was a curious one, to be sure, but it got there just the same.

Colocynth Apples.

United States Consul Wallace, of Jerusalem, Palestine, has made an interesting report to the State Department at Washington, under the date of January 25, in which he describes the growing of the colocynth plant. and makes some interesting suggestions as to its cultivation in the United States.

The colocynth, or bitter apple, he says, grows abundantly on the maritime plain that lies between the mountains of Palestine and the eastern shore of the Mediterranean. It is found from below the city of Gaza on the south to the base of Mount Carmel on the north. The dwellers along this plain pay little attention to the plant, and spend neither time nor labor in its cultivation. It grows without cultivation, the soil and climatic conditions producing it without the help of the husbandman. With some attention the plant would undoubtedly bear a larger and richer fruit—richer in that pulp which makes the colocynth valuable. But there is no object in thus improving the plant and its yield, as nature alone now supplies far more than the natives can find a market for.

The soil of this maritime plain is a light brown loam, very rich, and almost without a stone. In places where the loam has been mixed with sand the colocynth plant seems to thrive best. Very little rain falls on parts of this plain. The plant does not suffer from this lack of moisture. The climate is warm the year round, and during the summer months the heat is intense; so that the conditions necessary for the successful raising of the colocynth would seem to be a good soil, somewhat sandy, a warm climate and little moisture.

The plant itself resembles our common cucumber, but its fruit is globose, about the size of an orange, of a light brown color. Its rind is smooth, thin and parchment-like. It is known as the Turkish colocynth, and is superior to the Spanish and Mogador varieties in the amount of pulp its fruit contains. The pulp constitutes 25 per cent of the fruit. The rind and seeds are valueless.

The fellaheen or peasants gather the fruit in July and August before it is quite ripe. It is sold to Jaffa dealers, who peel it and dry the pulp in the sun. It is then moulded into irregular small balls, packed in boxes and shipped, mostly to England. The average annual shipment from Jaffa is 10,000 pounds, though last year's shipment amounted to only about 6,000 pounds. The quantity could be increased indefinitely if there were more demand for it and a price were paid that would make it an inducement for the peasants to gather and prepare it. The price now paid for the colocynth pulp, prepared, packed for shipment and delivered on the steamers in the port of Jaffa is about 30 cents a pound.

There seems to be no reason why the plant should not be successfully grown in certain parts of the United States. The soil and climatic conditions are certainly adapted to it.

Handling the New Firearms.

The Adjutant-General has issued the following directions:

Owing to the great amount of heat developed during firing, care must be exercised in the handling of the new arm, United States magazine rifle, cal. 0·30, model 1892.

After fifteen rounds fired rapidly (ten or more a minute) the piece should be handled only by the stock, hand-guard, or metal parts in rear of the chamber, as the barrel becomes uncomfortably hot about this time, though the rear sights and bands will not be found so until from thirty to thirty-five rounds have been fired.

In slow firing (at the rate of three or less a minute) the barrel of the piece should not be handled after from seventeen to twenty rounds.

After forty rounds fired at this rate, handle the arm only by the wooden parts and those metal parts in rear of the chamber.

If the leaf of the rear sight is raised during this firing (as it probably would be), the sight can be adjusted, if done quickly, even after a hundred rounds, without fear of burning the hand.

Two hundred rounds, probably the maximum amount to be carried by any soldier, or even as many as he can possibly carry, can be fired rapidly without injury to the arm, other than the charring of the wooden parts in contact with the barrel.

If it be necessary or desirable to cool the barrel more rapidly than it would when exposed merely to the air, remove the bolt, depress the muzzle until nearly vertical, and pour in water very slowly at first, until steam is no longer formed, when it can be poured rapidly.

In service the canteen or cup could be used for this purpose.

Owing to the large amount of water necessary to cool a heated rifle, from four to six quarts being required, artificial cooling would not ordinarily be practicable in the field.

There is little to be gained, even if employed, as after two hundred rounds one can handle the piece by the stock without burning the hand.

The soldier will soon learn to handle the piece carefully after any firing, no matter how little, and artificial cooling by water should not ordinarily be practiced, as it may prove injurious to the barrel.

The barrel of the Springfield rifle, caliber 0.45, using black powder, becomes too hot to handle (above the lower band) after about thirty rounds fired at the rate of seven a minute. In other words, it appears to take twice as many rounds in the old rifle as in the new, to bring the barrel to about the same temperature.

Until further orders the following spare parts only will be issued to companies to be kept on hand for the repair of the United States magazine rifle and carbine: main springs; magazine springs; sear springs; cut-off springs; stocks.

In case of damage to other parts of the rifle, such parts—if they can be detached without further injury to the arm—will be sent, properly marked for identification, to the commanding officer, Springfield Armory, with a statement of the circumstances under which the damage was incurred. If found advisable, the damaged parts will then be ordered replaced.

Company commanders should exercise a careful supervision of all dismounting and assembling of the arm, particularly in cases where any part is injured. The authorized dismounting and assembling by soldier, described in the rules for the management of the rifle, should be confined to what is necessary only for instruction under proper supervision, or for the necessary cleaning of the arm.

Demagnetization of Watches.

A simple method is as follows: A strong magnet is placed in a horizontal position—on a table, for instance—and the watch held horizontally about half a yard off on a level with the magnet. The watch must then be brought slowly nearer the magnet, while being turned slowly, and at the same time as regularly as possible, between the fingers, as on a vertical axis. When the poles of the magnets are reached, the turning of the watch is to be continued while being gradually withdrawn until the starting point is reached.

Instead of turning the watch with the fingers, it may be done by fastening it to a twisted string, as illustrated in our SUPPLEMENT, No. 782.

RECENTLY PATENTED INVENTIONS.

Engineering.

FEED WATER HEATER AND PURIFIER.—Daniel M. Robinson, Bay City, Mich. Connected with the boiler, according to this invention, is an outer shell or cylinder with water at a common level with that of the boiler, a settling cylinder within the outer shell having transverse partitions, an inlet pipe entering its bottom and a discharge pipe opening from its top, and a corrugated cylinder receiving the discharge. The feed water is by this means thoroughly purified before entering the boiler, and heated up to the temperature of the water in the boiler proper, the heating being effected by the exhaust passing out through the furnace flue, and the apparatus in no way interfering with the circulation of the boiler

MOTOR.—William H. D. Ludlow, Tecumseh, Neb. A power shaft carrying a master wheel, according to this invention, is driven by spring-controlled drums, there being means for transmitting power from the wheel, a sliding disk adapted for engagement with the arms of a governor and frictional engagement with the governor body, the sliding disk being operated by a brake bar. The motor is of simple and inexpensive construction and adapted to run any light machine. The motor, when running, may be stopped almost instantly without exerting undue pressure upon the springs in the drums.

Railway Appliances.

CAR COUPLING.—John C. Yeiser, Austin, Texas. This improvement comprises a link having foot members on its under face, side portions curved slightly upward toward one end, and the upper face being cut away from a point opposite the foot members toward the curved end portion. The link is designed to remain set in a coupling position at all times, and the inventor writes us of its very successful employment on railroads in Texas, where the conductors report that with this link the couplings can invariably be made from the engine, that curves may be readily rounded with the drawheads only an inch apart, and that the link is safer and stronger than any knuckle or hook coupling.

CONNECTING ROD FOR SWITCHES.—Ferdinand F. Maag, Beaumont, Cal. This improvement comprises a casing from which projects a rod threaded for a portion of its length, there being a coiled spring around the rod between washers in the casing, and a sleeve and nuts on the rod for regulating the tension of the spring. The rod is in a measure spring-controlled and automatic in its action, and may be readily and conveniently adjusted as desired to govern the throw of the switch.

TORPEDO SETTER.—John W. Raynor, Sedalia, Mo. This device comprises a pair of spring arms having oppositely curved free ends with terminal loops, a push plate being held between the arms and actuating a cam mechanism to move them. It is a simple and easily operated device by which a torpedo may be readily fastened to the rail from a rapidly moving train.

Mechanical.

ROLLING MILL.—Arthur Perry, Middletown, N. Y. In this mill there are rollers on vertical shafts on the lower ends of which are bevel gear wheels, gear wheels mounted in adjustable bearings meshing with the gear wheels of the vertical shafts, and there being spring-supported bearings for the upper ends of the vertical shafts. The machine will, at one operation, quickly and accurately roll metal into a bar of the desired shape, rollers having differently shaped grooves being inserted according to the work to be done. The machine is very compact and saves handling of the metal by the operator.

CARPENTER'S BENCH.—Eldridge M. Brown, Greenbank, W. Va. This bench is provided with a slidable plunger and mechanism for working it, there being a laterally extending gage bar hinged to the plunger, a guide for the gage bar and work-holding clips on it. Cabinet and carpenter work may be quickly and firmly clamped and held on the bench, which also has a vise adapted to hold a large range of work.

OILER.—Joseph H. Halladay, Clifton Heights, Pa. This device comprises a fixed spindle on which the wheel revolves, the spindle having an oil feed aperture opening onto the inner surface of the wheel and connecting it at its outer end with a pipe extending downwardly into the oil cup. The invention affords a simple oiler which will uniformly lubricate revolving surfaces, such as in trolley and other wheels, automatically feeding while the parts are in motion, and the feed ceasing as soon as the revolving parts come to rest.

Mining, Etc.

AMALGAMATING AND SEPARATING METALS.—Harold M. Baker, Brooklyn, N. Y. This invention relates to a dry process for separating silver and gold from its containing sand, and comprises the use of an amalgam of quicksilver and iron, which is afterward amalgamated with the gold or silver and then separated from the tailings by suitable magnets. The most essential feature of the invention consists in incorporating with the quicksilver sufficient iron to render the amalgam magnetic, so that the separation may readily take place.

Miscellaneous.

FLOWER DISPLAY STAND.—Albert A. Hirsh, New York City. Although especially designed for the display of artificial flowers, this is a simple and very inexpensive stand, which may also be utilized for showing to good advantage feathers and other articles of a similar nature. The table which forms the top of the stand, and in which are apertures to receive the stems of flowers, feathers, etc., may be adjusted to any desired inclination, and so held without the aid of set screws or other fastening devices, and is also readily fixed at such height as seems best, and when the stand is not in use it can be readily taken apart and packed in small compass. A table of any desired size may be used in connection with the base.

GARBAGE FURNACE.—Alexander Brownlee, Dallas, Texas. This is an improvement on a formerly patented invention of the same inventor, for a furnace with a fire grate and adjacent garbage grate separated from the wall of the combustion chamber by a downward passage for products of combustion, there being beneath the garbage grate a sand box filled with filtering material to permit liquid matter to drain into a filter casing. The arrangement is such that the products of combustion pass directly over and through the garbage, then beneath it and over the contents of the sand box, and back beneath this box, all the smoke and gases from the material being treated and the fuel being entirely consumed.

METALLIC DOOR.—Adolph H. Bobb, New York City. This door is composed of outside and inside sheet metal plates having at their sides and ends flanges connected with each other, each plate also having inwardly projecting panel flanges connecting with a central plate. This door can be inexpensively made to combine great durability and strength with lightness, and the several parts are easily fitted together.

WINDOW BLIND.—Godfrey Neuenschwander, Louisville, Ky. This inventor has devised an improvement in Venetian or slat blinds, whereby they may not only be rolled up, but may be placed to form a waterproof and sunproof awning. There is a guide for the blind at each side of the window, and the guide is hinged at its upper end and formed of sections hinged together, the construction being such that the upper section may be rolled up, exposing the upper section of the window, while the lower portion of the window may be closed or concealed by the lower section of the blind.

BUTTON HOOK ATTACHMENT FOR SHOES, [GLOVES, ETC.—James K. Rogers, Philadelphia, Pa. According to this invention a slide way is made along the inner side of the flap, and a permanently secured button hook has a sliding connection with the slide way, along which the buttoner may be adjusted to operate in connection with any of the buttons, facilitating the ready use of the button hook in buttoning shoes, gloves, etc. The slideway is preferably formed of a tape, while another tape, having sliding connection with the first one, carries the button hook, for which a pocket is provided in the shoe or glove.

SNAP HOOK.—Joseph H. Wittmann, Lincoln, Neb. This is a simple and inexpensive device in which a strongly constructed hook is positively closed by a spring, a trigger being arranged to lock the hook and take off the spring, while, by means of the trigger, the hook may be easily opened when necessary. The tongue is pivoted in a longitudinal recess of the body of the hook, and the trigger is pivoted on the rear end of the tongue.

KNOCKDOWN BOX.—Henry Hawley, Culpeper, Va. This is a box which, when properly set up, is designed to form a strong case for any character of goods, while, when the goods have been removed from it, it may be readily taken apart and compactly folded for return to the shipper. Its sides have external longitudinal grooves between their adjacent edges, and joint pieces secured to the outer faces of the sides have approximately right angular inwardly deflected portions projected into the corner recess, and have interlocking portions within the recess.

ENVELOPE.—Louis A. Rosett, New York City (deceased; Moritz Rosett, executor). This is an envelope especially designed for carrying valuable or registered packages, and has a diagonal joint between its lower flap and side flaps, while the top flap has diagonal edges with tabs projecting in a direction corresponding to the diagonal joints between the lower and side flaps, so that when folded the tabs overlie and extend along the diagonal joints, strengthening and bracing them longitudinally. In sealing, the wax seals are preferably placed on both tabs.

BOTTLE.—John H. Heslin, Brooklyn, N. Y. For valuable liquors and mineral waters, etc., this inventor has devised a bottle which cannot be refilled, to prevent substitution or sophistication, the bottle being inexpensive and permitting the ready outflow of its contents. It has a chambered neck, in which is a valve, there being a series of balls in the chamber above the valve, the balls having grooves to register with a longitudinal rib on the inner wall of the neck above the chamber.

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.

OFFICIELLER BERICHT DER K. K. OESTERR. CENTRAL COMMISSION. Vienna. 1894. Vol. II. Pp. 135. 60 plates.

The second volume of the official report of the Austrian commission to the Columbian Exhibition treats on the United States Brewing Industry, and has been admirably prepared by Professor Franz Schwackhofer, of Vienna. The author regrets that the brewing industry of the United States was only represented by its products and a few minor machines which did not give an adequate idea of the tremendous and scientific arrangement as found by the professor in the breweries of the United States. The text is divided in five chapters, treating malting, breweries, brewery plants, refrigerating machines and steam boilers. The plates are large and very nicely executed.

The Coal Mining Catalogue of the Ingersoll-Sergeant Drill Company, of New York, is a well got up book of more than 100 large pages, describing, with ample illustration, the coal mining machinery and appliances manufactured by the company. The construction and operation of their improved air compressors naturally fill a leading position in the book, but there is a good deal also about drills for different kinds of service, about pumps, pipes and pipe fittings, machinery for shaft sinking, etc. Machinery made by this company is now in successful operation in almost every quarter of the world, and wherever mining is carried on its work is recognized as upholding a high standard of efficiency.