

fectly square—against drilling three-sided holes for a tap bolt—against drilling holes so small that the tap must be driven in with a hammer before it will “take”—against tapping holes in castings as they come from the foundry, full of scale (this we have repeatedly seen done)—and against the whole array of misuses to which these costly appurtenances of a machine-shop are subjected. It takes time to make a tap, and as a great deal depends upon having them in good condition, more attention should be given to the proper use of them.

#### GEOLOGY AND THE “KING CRAB.”

“Visitors to the Aquarium House at the Zoological Gardens have no doubt noticed the living specimens of that curious creature, the ‘king crab,’ which are now in a tank alive and well. The most curious part of their structure is the eyes; they have four, which are composed of numerous lenses, like the dragon-fly or bee, and are so arranged that they can see objects on each side of them. Besides being interesting simply as living creatures, king crabs are the nearest existing relations to the ancient form of beasts called ‘trilobites.’”—*The London Field*.

The king crab is what is commonly known here as the “horse-shoe.” Such creatures are taken by thousands annually on the marshy coasts of New Jersey and Long Island, and are used extensively for manuring the land. No living specimens are now found in England, but their fossils are not uncommon. The past geologic age of Europe is similar in many of its features to the present in the New England States. Hugh Miller in his lecture on geology says: “America though emphatically the *New World* in relation to its discovery by civilized man, is at least in these regions an *old world* in relation to geological type; and it is the so-called *Old World* that is in reality the *new one*.” Professor Agassiz says: “If we compare a list of the fossil trees and shrubs from the tertiary beds of Oeningen with a catalogue of the trees and shrubs of Europe and North America it will be seen that the differences scarcely go beyond those shown by the different floras of those continents under the same latitudes. But what is quite extraordinary and unexpected is the fact that the European fossil plants of that locality more closely resemble the trees and shrubs which grow at present in the Eastern parts of North America than those of any other part of the world. The present Eastern American flora and fauna have a more ancient character than those of Europe. The plants, especially the trees and shrubs growing in our days in the United States, are as it were, old-fashioned.” On this topic Hugh Miller again says: “Towards the close of the miocene period old Scotland exhibited features greatly resembling those presented to the Puritan fathers by the forest-covered shores of New England, little more than two centuries ago.

#### The Launch of the “Re d’Italia.”

The powerful steam ram frigate, *Re d’Italia*, built by William H. Webb, Esq., for the Italian Government, was launched from the constructor’s yard, at the foot of Sixth street, East River, at 5 minutes before 10 o’clock, on the morning of the 18th ult. The frigate is 230 feet in length, and has 68 feet beam. The sides of the vessel will be covered with 4½-inch iron plates; these, we believe, are to be made in France, and the combined thickness of the ship’s sides, including all, will be 38½ inches; the backing is of wood. The frigate will be about 7,000 tons burthen; she is to be propelled by two horizontal back-acting engines, having cylinders 84 inches in diameter by 45 inches stroke; furnished with surface condensers and all the modern improvements. The screw propeller is a massive brass casting and weighs nearly 30,000 pounds. It is a two-bladed, expanding-pitch screw, and will be fitted with patent hoisting gear, so arranged as to be hoisted out when under sail alone. All the work done upon the vessel, so far, is of the most substantial description, and will conduce greatly toward sustaining the builder’s reputation abroad.

A large number of ladies and gentlemen were present on the occasion of the launch, which passed off very handsomely, and Mr. Webb may congratulate himself, under the circumstances, that Fortune favored all his efforts to attain success.

#### CAUSES OF THE PHENOMENA IN ORGANIC NATURE.—THE ORIGIN OF SPECIES.

Of late years men of science and others have wrangled much over Mr. Darwin’s work on “The Origin of Species.” In most of the English and American reviews his treatise has been severely criticized, as having an infidel tendency; not on account of the facts therein given, but the conclusions of the author. He appears to have been very generally misunderstood, judging from a most interesting little work just issued by D. Appleton & Co., this city, being the publication of six lectures delivered to working men, by Thomas H. Huxley, F. R. S., Professor of Natural History in the School of Mines, London. Broadly stated, the subject of these lectures consists of an inquiry into the origin of species and a discussion on the causes of the phenomena in organic nature.

The meaning of organic nature is something that grows, has life and reproductive powers. It is exemplified in the seed of a plant in contradistinction to a grain of sand. Organic nature embraces the vegetable and animal kingdom, as entirely distinct in functions from rocks, fluids, and what chemists call “elementary matter.” Animals and plants are divided by naturalists into groups, and these into kingdoms, sub-kingdoms, provinces, classes, orders, families, genera, and species. It was once very generally believed (and many persons entertain such views still) that there was such a thing as spontaneous generation—that is, mere elementary matter, such as pure water or mineral dust exposed in favorable positions, to light and heat, would bring forth vegetation and animalcula spontaneously. Hence it has been asserted that, if there is such phenomena as the spontaneous generation of life, according to the “development theory” of some naturalists and the views of Mr. Darwin on the origin of species, man may have been developed from the lowest forms of spontaneous generation. If such views were founded on facts in natural history, pantheism, viz., that “God is nature and nature is God,” would be supported upon a very firm foundation.

Mr. Darwin does not discuss the question of spontaneous generation at all, and science completely silences pantheism. Every organism commences existence in an egg-cell or seed, and each seed is believed to have been specially created, with special functions and powers of reproduction, as stated in the Scriptures. M. Pasteur, a distinguished French chemist, has lately made a great number of carefully conducted experiments to test the theory of spontaneous generation. The results of his labors seem to be conclusive against the theory; no such property as spontaneous creation belongs to elementary matter acted upon by the forces of nature. An old and bitterly disputed question thus appears now to be settled scientifically.

Another question of much dispute seems to be settled by Mr. Darwin; thus the Caucasian, the Malay, and the Negro, according to his facts, are varieties of species, and may all have descended from a single pair, as set forth in the Scriptures. On the other hand, Prof. Agassiz and others believe they have descended from different original pairs, and thus they would really be different orders. In 1793, a new variety of sheep was produced by Seth Wright of Massachusetts. He had a flock, the members of which were specially gifted with the power of jumping fences, and thus tormenting the proprietor and his neighbors. In one accidental buck lamb, which had very short bowed legs, the acute mind of Seth Wright saw a remedy for his troublesome fence-jumpers, and by careful breeding he at last obtained an entire flock of long-bodied short-legged sheep, called the “otter breed,” from this single buck which could not jump a foot-rail. Various species of dogs, hogs, and pigeons have been produced in the same manner. In structure they are different from others of the same genus, but psychologically they are identical. There is a well defined limit to organic varieties in animals. Two entirely different races may mix; but their progeny, as in the case of mules, become sterile. Professor Huxley states that there are no reliable exceptions to this law.

The rapid powers of production in plants from a single specimen, is set forth by Prof. Huxley as follows:—“Suppose the habitable part of the globe to be

51,000,000 square miles, and the climate and soil equal over that space, it may be entirely covered in nine years from the product of a single plant bearing fifty seeds, each plant requiring one square foot of soil for support.” It is hardly conceivable that the whole stated available surface of the earth could be stocked in about nine years from a single plant, yet the figures demonstrate such a possibility.

#### VALUABLE RECEIPTS.

**BRONZING METALS.**—The production of different colors on the surface of metals, such as works of fine art, &c., is called bronzing. Mere surface-coloring is executed with metallic powders mixed and applied with a varnish. But the most perfect bronzing is produced by chemical action on the metal itself—its own surface being thus made to form the bronze color. Dr. Ure says, respecting this art:—“Coins and metals may be handsomely bronzed as follows:—2 parts of verdigris and 1 part of sal-ammoniac are to be dissolved in vinegar; the solution is to be boiled, skimmed and diluted with water till it has only a weak metallic taste, and upon further dilution lets fall no white precipitate. This solution is now made to boil briskly and is poured upon the objects to be bronzed. These objects must have been previously cleaned and made perfectly free from grease and set in a copper pan. This pan, with the articles now in it, is put on a fire and the solution made to boil for some time. The articles, if made of copper, will acquire an agreeable reddish-brown hue without losing their luster; but if they are boiled too long, the coat of oxide upon them becomes too thick and looks scaly and dull; and if the solution is too strong, the copper becomes covered with a white powder which becomes green on exposure to the air. The pieces thus bronzed must be washed well in warm soft water and then carefully dried, or they will turn green. The antique appearance is given with a solution of three-quarters of an ounce of sal-ammoniac and a drachm and a half of binxalate of potash (salt of sorrel) dissolved in a quart of vinegar. It is applied with a soft rag to the surface of the metal, then allowed to dry. Several applications are thus made until a coating of sufficient thickness is obtained. Copper acquires a brown color by rubbing it with a solution of the common liver of sulphur or sulphuret of potash.”

The Chinese are said to bronze their copper vessels by taking 2 ounces of verdigris, 2 ounces of cinnamon, 5 ounces of sal-ammoniac and 5 ounces of alum, all in powder, making these into a paste with vinegar and spreading it upon the surface of the article, which should be previously brightened. The article is then held over a fire till it become uniformly heated, then it is cooled, washed and dried. It thus receives one, two or several of such coats until the desired color is obtained. An addition of sulphate of copper to the mixture makes the color chestnut-brown.

A good method of bronzing copper articles, such as tea urns, to prevent them tarnishing, is described in most all the best treatises on chemistry. It is as follows:—The copper is first cleaned, then brushed over with peroxide of iron (generally colcothar) made into a paste with water or with a dilute solution of the acetate of copper. The article is then placed in a muffle in a furnace and heated cautiously for some time, then taken out and cooled. Upon brushing off the oxide the surface underneath is found to have acquired the desired hue.

Another method of bronzing copper is to brush it over with a paste of black lead, place it over a clear fire till moderately heated, then brush it off. A very beautiful bronze is thus produced. The surface of the copper must be perfectly bright when the black lead is applied. A thin film of wax or tallow applied to copper and the article placed on a clear fire until the wax or grease begins to smoke, produces a bronzed surface. In all these operations great care is necessary in managing the articles properly when subjecting them to the action of heat.

The following is a receipt which we have been told will produce a beautiful dark bronze on brass:—To 1 pound of muriatic acid add 6 ounces of the peroxide of iron and 3 ounces of yellow arsenic; mix these together and let the solution stand for about two days, shaking it occasionally. The brass article, perfectly

free from dirt and grease, is now to be immersed in it and allowed to stand for about three hours, when it turns perfectly black. It is then lifted out and washed well in soft water and dried in sawdust. After this it is coated with a paste of black lead used for iron stoves, and when dry it is polished with a brush. After this it may receive a thin coat of lac-varnish.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list.

**Machines for Printing Designs on Textile Fabrics.**—This invention consists in imparting to the material to be printed a lateral vibrating motion, during the operation of printing, in such a manner that the printed surface assumes a watered appearance of different patterns according to the rapidity of the vibrating motion when compared with the rotary motion of the printing and pressing rollers; it consists further in the combination with the printing and pressing rollers of a vibrating roller, the lateral motion of which can be regulated by means of cranks, pattern or eccentric wheels or any other suitable device, in such a manner that the vibratory motion of the cloth or other material passing over said roller to and between the printing rollers can be regulated according to the desired pattern; it consists, finally, in the arrangement of two hinged angular levers in combination with the let-off roller, from which the fabric to be printed unwinds, and with a weighted roller, in such a manner that the pressure exerted by the weighted roller on the gudgeons of the let-off roller regulates itself according to the varying diameter of said roller and consequent increase or decrease in the power required for turning the same, and that by these means a perfectly uniform tension of the fabric, during the operation of printing, is effected. Edward Leitenberger, of Reichstadt, Kingdom of Bohemia, is the inventor of this device, but further information about it may be had by addressing the assignee, A. G. Scheller, 370 Bowery, New York.

**Coloring Photographic Pictures.**—The object of this invention is to enable photographic pictures on albumenized paper to be successfully colored with dry colors. Such pictures, owing to the albumenized paper not being capable of receiving dry colors without some preparation, and no perfectly suitable preparation having been heretofore known, are commonly colored with water colors, and this can only be done successfully by skillful artists so as to bear the close inspection to which such pictures are subject. This invention consists in the use of collodion as a medium for receiving dry colors on such pictures. James F. Bodtker, of Madison, Wis., is the inventor of this improvement.

**Direct-acting Engine.**—The object of this invention is to arrange the main valve of a steam cylinder in such a manner that the steam is changed and a full head of steam admitted as soon as the piston arrives at the end of its stroke, and that the engine will pass the dead points without the aid of a balance wheel. The invention consists in the employment, in combination with the ordinary slide valve, of a secondary steam cylinder provided with a slide valve in such a way that by the action of said secondary cylinder the main valve is suddenly thrown from one end of the steam chest to the other, before the piston of the main cylinder arrives at the end of its stroke, and that by these means the steam is changed and a full head of steam admitted to reverse the motion of the piston without the aid of a balance wheel. The motion of the slide valve of the secondary cylinder is governed by the action of cams and by the motion of the secondary cylinder. Louis Winterbauer, of New York City, is the inventor of this engine.

**Railroad Car Brake.**—The object of this invention is to obtain a car brake by which all the brakes of a series of cars comprising a train may be operated simultaneously by the engineer, and the brakes made to act with an equal or uniform pressure on all the wheels of the several cars; the invention, at the same time, admitting of a brakeman applying the brakes at either end of a train after the locomotive

is detached. Joseph Hough, of Buckingham, Pa., is the inventor of this improvement.

**Revolving Fire-arm.**—The principal object of this invention is to provide for the loading of a revolving fire-arm with metallic cartridges carrying their own priming in hollow flanges projecting circumferentially around their rear ends without having the revolving cylinder of the arm open at its rear end; and hence it consists in the construction of a revolving fire-arm with a number of independent movable chambers fitted to slide longitudinally within openings in the sides of the revolving cylinder; it also consists in the employment, in combination with such a system of movable chambers, of a stationary piston secured to the frame of the arm for the purpose of expelling the discharged cartridge shells from the said chambers by a forward movement of the chambers from the cylinder. F. P. Slocum, of Brooklyn, N. Y., is the inventor of this fire-arm.

SECONDARY GOVERNMENT FEES ON PATENTS.

We would call the attention of patentees to the annexed amendment of the Patent Laws, enacted March 3, 1863:—

Every patent shall be dated as of a day not later than six months after the time at which it was passed and allowed, and notice thereof sent to the applicant or his agent; and if the final fee for such patent be not paid within the said six months, the patent shall be withheld, and the invention therein described shall become public property as against the applicant therefor: Provided, that in all cases where patents have been allowed previous to the passage of this act, the said six months shall be reckoned from the date of such passage.

From the above it will be seen that it is incumbent on every patentee to pay the second Government fee within six months after a patent is allowed, or else it will become public property and the inventor will be deprived of the patent.

**THE BIBLIOTHECA SACRA.** Published by Warren F. Draper, Andover, Mass.

This theological review for April contains nine essays on different subjects, viz: "The Roman Empire and Christianity;" "Buckle's History of Civilization;" "The Old School in New England Theology," &c. *The Bibliotheca Sacra* is very cosmopolitan in an evangelic sense, and is exceedingly candid in controversy. Its essays are not dry "marrowless treatises," like those of the old schoolmen, nor are they flippant, like those of too many modern writers on such topics, but they are usually brilliant, acute and learned.

Binding the "Scientific American."

It is important that all works of reference should be well bound. *THE SCIENTIFIC AMERICAN* being the only publication in the country which records the doings of the United States Patent Office, it is preserved by a large class of its patrons, lawyers and others, for reference. Some complaints have been made that our past mode of binding in cloth is not serviceable, and a wish has been expressed that we would adopt the style of binding used on the old series, i. e., heavy board sides, covered with marble paper and morocco backs and corners. Believing that the latter style of binding will better please a large portion of our readers, we shall commence on the expiration of this present volume to bind the sheets sent to us for the purpose in heavy board sides, covered with marble paper and leather backs and corners. The price of binding in the above style will be 75 cents. We shall be unable hereafter to furnish covers to the trade, but will be happy to receive orders for binding at the publication office, 37 Park Row, New York.

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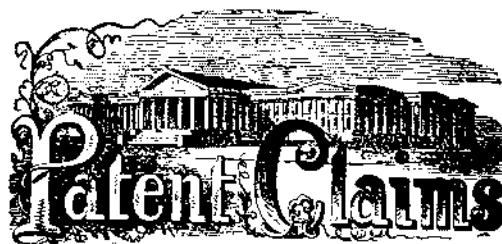
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**INVARIABLE RULE.**—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

**PATENT CLAIMS.**—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known and inclosing \$1 as fee for copying. We can also furnish a sketch of any patented machine patented since 1833, to accompany the claim, on receipt of \$2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

Models are required to accompany applications for Patents under the new law, the same as formerly, except on design patents when two good drawings are all that is required to accompany the petition, specification and oath, except the Government fee.

**NEW PAMPHLETS IN GERMAN.**—We have just issued a revised edition of our pamphlet of *Instructions to Inventors*, containing a digest of the fees required under the new Patent Law, &c., printed in the German language, which persons can have gratis upon application at this office. Address MUNN & CO., No. 37 Park-row, New York.



ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING APRIL 14, 1863.

Reported Officially for the Scientific American.

\* \* Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

**38,130.—Metallic Hoop.**—J. L. Alberger, Buffalo, N. Y.: I claim a hoop for barrels, casks, tierces or other vessels made of steel, having one or more corrugations or creases in it, for the purpose herein described.

**38,140.—Manufacture of Steel.**—Charles Attwood, Tonlaw Iron-works, Durham county, England. Patented in England May 15, 1862: I claim the production or manufacture of steel and iron of a steely quality, substantially as hereinbefore described and set forth.

**38,141.—Screw.**—J. A. Ayres, Hartford, Conn.: I claim a screw, A, with a dovetailed slot, a, as and for the purpose set forth.

[This invention consists in the arrangement of a dovetailed slot in the head of a screw, in such a manner that the edges of said slot afford a good and firm hold to the screwdriver, and that said slot is not liable to wear out and cause the screwdriver to slip.]

**38,142.—Provision-cooler.**—J. W. Bartlett, New York City: I claim a cooler or refrigerator consisting of the provision chamber, T, air and water chamber, S, ice box, H, hollow tubes, O O, when arranged substantially as and for the purposes specified.

**38,143.—Station and Street Indicator for Railroad Cars.** Alexander Bertier, Hannibal, Mo.: I claim the endless band with a star or pointed wheel attached to one of its rollers or the shaft thereof, and a projection at the side of the track or road to actuate said wheel, in combination with a bell, combined striking-hammer and stop, and the pins or rods, b, the latter being attached to the roller aforesaid, and all arranged to operate substantially as and for the purpose herein set forth.

I further claim the weight, I, applied to one of the rollers of the endless band, when used in combination with the other parts of the band-moving mechanism, for the purpose specified.

[This invention consists in the employment or use of an endless band having the names of the stations or streets marked upon it and placed within a suitable case inside the car, in combination with a bell, a combined bell-hammer and stop, and a band moving mechanism, whereby the several stations or streets will be indicated, as they are reached, to the passengers in the car, and an alarm sounded so as to direct the attention of the passengers to the indicator.]

**38,144.—Coloring Photographs.**—J. F. Bodtker, Madison, Wis.: I claim the use of collodion as a medium for receiving dry colors on photographic pictures on albumenized grounds, substantially as herein described.

**38,145.—Churn Dasher.**—A. C. Brown, Sycamore, Ill.: I claim the churn dash, constructed and operating substantially as and for the purposes set forth.

**38,146.—Carbon Plate for Galvanic Batteries.**—C. T. Chester, New York City: I claim, in combination with a carbon element of a galvanic battery, a gold or platinum connection imbedded in the carbon during the process of manufacture of the carbon element, substantially as described.

**38,147.—Cork-drawer.**—Chas. Chinnock, Brooklyn, N. Y.: I claim the combination of the ratchet cap, a, the loose snail-like cam or screw, b, and the corresponding cam or screw, c, with the independent worm and pillar, d, all operating together for the purpose set forth.

**38,148.—Chuck for Lathes.**—J. Christman and Wm. Gillfillan, Syracuse, N. Y.: We claim a chuck, constructed, arranged and operated as described, that is to say, having the sliding pins or dogs, L, working in the radial dovetail grooves, in the outer casement wheel, in combination with projections, O, working in the eccentric grooves in the face of the inner wheel or disk, J, when said wheel or disk, J, is operated by means of the tangential screw, H, the several parts being constructed, arranged and operated in the manner described, for the purpose specified.

**38,149.—Lamp.**—G. F. J. Colburn, Newark, N. J.: I claim the reservoir, A, having the arms or projections, a and b, so formed and combined with it, as to support and supply with oil more than one burner, simultaneously, as specified. I claim the application of the cap between the burners for the object specified.

**38,150.—Lamp Chimney.**—G. F. J. Colburn, Newark, N. J.: I claim the method of connecting a tube with a lamp or gas burner by means of a fixture made and attached as described, so that it may be combined with or removed from a glass globe or other transparent device protecting the flame, substantially in the manner and for the purpose specified.

**38,151.—Mast for Navigable Vessels.**—Cowper P. Coles, Southsea, England. Patented in England, April 10, 1862: I claim the construction of masts for vessels of tubes of steel or iron, in the manner and for the purposes substantially as set forth herein.

**38,152.—Evaporating Pan for Sugar Juices.**—D. M. Cook, Mansfield, Ohio: I claim, first, The arrangement of a zig-zag steam coil, constructed substantially as described, within the ledges of an evaporator pan which allows the juice to flow continuously in an indirect course, as against the impurities and also keeps the juice comparatively cool on side of the steam coil, substantially as and for the purposes described.

Second, The combination of the steam coil metal bottom, partitions, wooden ends and wooden bottom, in the manner and for the purpose described. Third, The manner of suspending the coil.

**38,153.—Cylinder Polisher.**—George Cowing, Seneca Falls, N. Y.: I claim a cylinder polisher composed of the stem, D, springs, A, A, and rubbers, B, constructed substantially as set forth.

**38,154.—Steam Radiators.**—R. T. Crane, Chicago, Ill.: I claim, first, Constructing the base, A, of a steam radiator of two or more chambers, and connecting the said chambers by the vertical U-shaped pipes, B, when arranged and operating substantially as and for the purposes delineated and set forth.