

Editorial Summary.

soon been excelled. A breed of pigeons may never be produced with a beak shorter than that of the present short-faced tumbler, or with one longer than that of the English carrier, for these birds have weak constitutions and are bad breeders; but the shortness and length of the beak are the points which have been steadily improved during at least the last one hundred and fifty years; and some of the best judges deny that the goal has yet been reached. We may also reasonably suspect, from what we see in natural species of the variability of extremely modified parts, that any structure, after remaining constant during a long series of generations, would, under new and changed conditions of life, recommence its course of variability, and might again be acted on by selection. Nevertheless, as Mr. Wallace has recently remarked with much force and truth, there must be both with natural and domestic productions a limit to change in certain directions; for instance, there must be a limit to the fleetness of any terrestrial animal, as this will be determined by the friction to be overcome, the weight to be carried, and the power of contraction in the muscular fibers. The English racehorse may have reached this limit, but it already surpasses in fleetness its own wild progenitor, and all other equine species. It is not surprising, seeing the great difference between many domestic breeds, that some few naturalists have concluded that all are descended from distinct aboriginal stocks, more especially as the principle of selection has been ignored, and the high antiquity of man, as a breeder of animals, has only recently become known. Most naturalists, however, freely admit that various extremely dissimilar breeds are descended from a single stock, although they do not know much about the art of breeding, cannot show the connecting links, nor say where and when the breeds arose. Yet these same naturalists will declare with an air of philosophical caution, that they can never admit that one natural species has given birth to another until they behold all the transitional steps. But fanciers have used exactly the same language with respect to domestic breeds; thus an author of an excellent treatise says he will never allow that carrier and fantail pigeons are the descendants of the wild rock pigeon, until the transitions have "actually been observed, and can be repeated whenever man chooses to set about the task." No doubt it is difficult to realize that slight changes added up during long centuries can produce such results; but he who wishes to understand the origin of domestic breeds or natural species must overcome this difficulty.—*Darwin's Animals and Plants under Domestication.*

The Dighton Rock Inscription Disappearing.

A correspondent of the Taunton (Mass.) Gazette says the inscription on the celebrated Dighton rock, near Taunton, is slowly disappearing, owing to the effect of ice upon its surface during the winter. The solution of this singular inscription, says the writer, has given rise to much speculative inquiry, and a great diversity of opinion. It has challenged the attention of many scholars learned in antiquarian lore. Mr. Harris, the learned orientalist, thought he found the Hebrew word *melek* (king) in the inscription. Colonel Vallancy considered it of Scythian origin. The Rhode Island Historical Society caused a carefully prepared drawing of the rock to be sent to the Royal Society of Antiquaries of Copenhagen, by whom it was submitted to Professor Rafn, the eminent Runic scholar, and learned associate, Professor Finn Magnusson. A part of the inscription they declared to be in the Runic character, and to read: "On this spot landed Thornfenn with one hundred and thirty-one men." Various drawings have been made of the rock and its inscription, from that of Cotton Mather to the present day, all of them differing in essential particulars; but last summer a successful attempt was made to photograph the rock with a large plate, as well as stereoscopic size, and the inscription may now be critically examined by the antiquarian.

Insulation of the Atlantic Cable.

The Boston Journal of Chemistry, asserts on the authority of a gentleman intimately connected with the working of the Atlantic Telegraph Cable that the insulation is growing monthly more perfect, and that the first cable, laid four years since, leaks less than the last one. The loss, at the present time, does not reach half of one per cent upon both cables. This is surprising, and very encouraging to the owners of the line. The extreme cold of the deep sea basin, in which the wires repose, is favorable to the retention of the electrical impulses in the channel provided for them. The time consumed in charging and discharging the conductors is a bar to rapid communication; but this is to be overcome by new methods of insulation. A device has recently been brought forward which promises to fully remove this obstacle, and thus enable submarine cables to perform double the work in the same length of time. The success of deep sea cables is now fully assured, and we may look for a large increase in the number during the next quarter of a century.

INTERNATIONAL BRIDGE OVER NIAGARA.—The special committee of the city of Buffalo, appointed to confer with the railroad companies interested in the erection of an international bridge over the Niagara river, have submitted voluminous and favorable reports. They recommend an iron bridge with stone piers and abutments, and that the city of Buffalo guarantee for fifteen years the payment of six per cent interest on \$1,250,000, on certain conditions, to be agreed to by the companies holding the charters from the respective governments. The Grand Trunk Railway obligates to pay \$50,000 annually for the privilege of passing trains over the bridge. The city council are favorably disposed, and it is thought that the terms will be agreed to.

CEMENT FOR LEATHER.—The *Coachmakers' Journal* says, of the many substances lately brought very conspicuously to notice for fastening pieces of leather together, and in mending harness, joining machinery-belted, and making shoes, one of the best is made by mixing ten parts of sulphide of carbon with one of oil of turpentine, and then adding enough gutta-percha to make a tough thickly flowing liquid. One essential pre-requisite to a thorough union of the parts consists in freedom of the surfaces to be joined from grease. This may be accomplished by laying a cloth upon them and applying a hot iron for a time. The cement is then applied to both pieces, the surfaces brought in contact, and pressure applied until the joint is dry.

MATURITY OF WINES.—Dr. Dupré, lecturer on chemistry at Westminster hospital, states in a paper on wine, recently published, that pure natural wine may be considered to have arrived at maturity at the end of from five to twelve years. In that time, he remarks, the slow chemical changes which bottled wine undergoes will have produced their best effect; and after that, "the wine no longer improves by keeping, except to the taste of a few would-be connoisseurs." But there are exceptions to this rule—namely, wines unusually rich in quality, and those which are "fortified" by alcohol. Such wines continue to improve up to the end of fifteen years.

THE supposed cavities in diamonds, described by Brewster, are shown to be in reality inclosed crystals; and the conclusion arrived at, from the consideration of the whole structure of the diamond, is not opposed to its having been formed at a high temperature. The crystals inclosed in diamonds are frequently seen to be surrounded by a series of fine radiating cracks, which are proved to have been the result of the contraction suffered by the diamond in solidifying over the inclosed crystal. This explanation has been artificially verified by examining crystals formed in fused globules of borax glass, cooled slowly, when the same phenomena are seen.

INTELLIGENCE OF ANTS.—Each ant in an ant-hill knows its companions. Mr. Darwin several times carried ants from one hill to another, inhabited apparently by tens of thousands of ants; but the strangers were invariably detected and killed. Thinking that there might be a family odor by which they were recognized, he put some ants from a very large nest into a bottle strongly perfumed with asatetida, and restored them after twenty-four hours. At first they were threatened by their companions, but soon recognized, and allowed to pass.

VARNISHING PRINTS.—The following method of varnishing photographic prints is recommended by a correspondent: A piece of plate glass is heated, and, while yet warm a little wax is rubbed over it by means of a piece of cotton wool; water is then poured over the plate, and the moistened picture laid thereon and pressed closely down by means of a piece of filtering paper. When dry the picture is removed and will be found to possess a surface of the greatest brilliancy, which is not injured by the process of mounting.

A FRENCH JOURNAL publishes the following cure for hydrophobia. When a person has been bitten by a mad dog let him take seven (?) vapor baths, called Russian baths, ranging in temperature from fifty-seven to sixty-three degrees. This is the preservative treatment. When the disease shows itself let the bath be rapidly brought up to fifty-seven degrees and then slowly increased to sixty-three degrees. In the latter case one bath suffices, but the patient must carefully keep his room until he is thoroughly cured.

COCOANUT FIBER.—At a recent meeting of the Polytechnic Society of Liepsic, one of the members asserted that belting for machinery could be made of cocconut fiber, possessing for this purpose many advantages in economy, durability, and applicability, over leather, rubber, and other substances most commonly used. How the proposed belting is to be made we have not learned.

CHIEF ENGINEER JAMES W. KING has been nominated to be Chief of the Bureau of Steam Engineering. President Grant states at the bottom of his order "in place of Isherwood whom I desire removed." It is very evident that the President means reform and we are glad to see him striking at the root of the matter.

PATENT CASE—DESULPHURIZING ORES. BEFORE JUDGE BLATCHFORD.

The Gold and Silver Ore Separating Company vs. The United States Distilling Ore Company and Melchor B. Mason.—The plaintiffs in this cause were the owners of a reissued patent, No. 1,928, reissued June 6, 1865, to the Hagan Manufacturing Company and William E. Hagan, as assignees of William E. Hagan, for an improvement in furnaces for washing ores by superheated steam. The defendants were the owners of a patent issued January 3, 1865, to C. V. De Forest, Amos Howes & Co., and Geo. E. Vanderburgh as assignees of Melchor B. Mason, for an improved method of desulphurizing and oxidizing metallic ores. The plaintiffs alleged in the bill in this action that Hagan was the inventor of the improvements claimed in the reissue, No. 1,928, and that said invention was identical with that covered by the defendants' patent, and they prayed that the defendants' patent should be adjudged void. The defendants answer set up that the original patent was not for the same invention as that covered by their patent, and that the reissue, No. 1,928, was procured for the purpose of fraudulently covering the inventions made and patented by Mason, and was fraudulent and void; that Hagan was not the first inventor, and that Mason was, and it prayed that the court would decree that the plaintiffs' patent was void, and the defendants' patent valid. On the argument, it was claimed by the defendants that the reissue, No. 1,928, and the defendants' patent did not claim the same thing, and were not, therefore, "interfering patents," in the sense of the thirty-sixth section of the act of July 4, 1836. Held by the Court.—That the answer does not set up that the two patents do not claim the same thing, but does allege in substance that they do cover the same thing. That independent of the admission in the answer, there can be no doubt that the two patents do cover the same invention. That the first claim of one patent is identical with the first claim of the other, and the first claim of the defendants' patent must be held to interfere with the first claim of the plaintiffs' patent. That the second claim of the defendants' patent does not interfere. That on the evidence there can be no doubt that Hagan was the first inventor of the invention claimed by him in this first claim, or that he intended to claim it in the original patent, or that the reissue, No. 1,928, is for the same invention. That the weight of the evidence is very preponderating that Mason borrowed from Hagan all that is embodied in the first claim of the patent, No. 45,803. Decree, therefore, for the plaintiffs, adjudging the patent No. 45,803 to be void so far as the process therein described for removing sulphur, arsenic, phosphorus, and anti-

mony from auriferous, argentiferous, and other metallic ores, and for oxidizing the ores by treating them with hydrogen and carbonic acid gases, sulphur, or applies superheated steam, substantially as described in the reissue, No. 1,928, and that the defendants must pay the costs. For plaintiffs, C. M. Keller; for defendants, G. Gifford.

Hagan's patent, as reissued June 6, 1865, claims

First, The employment or application of superheated steam, in the manner set forth, for the purpose of refining or reducing metals, and for the removal of sulphur, arsenic, phosphorus, or other impurities from ores or minerals. Second, The employment or application of superheated steam, for the purpose of calcining and disintegrating quartz rock containing silver, gold, or other metals. Third, The employment or application of superheated steam for the refining of iron, and for the converting of iron into semi or pure steel, in the manner set forth.

This invention is said to be a very valuable one, hence the decision is important to the whole mining interest.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

At the Wilder Works, in East Tennessee, good iron is now being made out of raw coal and raw ore. Colonel Wilder recently said: "At the Hollidaysburg mines, in Pennsylvania, they dig 350 feet for a vein of fossiliferous ore only seven to thirteen inches thick, and here we have it above ground from three to fifteen feet thick. It costs in Pittsburgh more for the limestone than it costs us here for all the materials to make the iron."

It is reported that there are at present one hundred and seventy-eight different places in San Francisco where cigars are made, and about one thousand persons are engaged in the business. These establishments turned out 50,000,000 cigars the past year. About fifty factories are exclusively controlled by Americans, and about one hundred are managed by Chinamen. The tobacco plantations in the southern portion of the State promise heavy and fine crops this year.

An old Indian silvermine has been found in Indiana. Over one of the furnaces was found a tree that had attained a diameter of fifteen inches, showing the great antiquity of the mine. A quantity of fine metal was found at the bottom of one of the furnaces.

Since the last "shaking up" in San Francisco, the mechanics of that city have turned their attention to the contrivance of earthquake proof chimneys for the large factories. An immense iron smoke stack, forty feet high, eight feet in diameter, has just been raised upon a sugar refinery, the roof of which is sixty feet from the ground.

The Bank of California, in San Francisco, is said to employ Chinamen in half dozen gangs to count silver coins. They are said to possess marvelous skill in detecting spurious coins or those of light weight.

The land sales of the Hannibal and St. Joseph Railroad Company during the past year amounted to over million seven hundred and fifty thousand dollars.

A Pennsylvania firm have bought the Roup's Valley Iron Works, and propose to invest \$500,000 in them.

Forty whiskey distilleries in the sixth district, Kentucky, each use three hundred bushels of corn per day. The total amount used by the distilleries in the district is estimated at three million bushels per annum.

The tobacco sales at Paducah, Kentucky, during the last week were the heaviest ever known there.

The rubber works at Sandy Hook, Newtown, have received an order for a rubber belt three hundred feet long and four feet broad. If the works can turn it out, it will be the largest rubber belt ever made.

The Hoosac Valley Mills, at Pownal, Vermont, manufactured thirty-five thousand yards of cassimere during the twenty-four working days of February.

The largest single nugget ever found in any part of the world, weighing twenty-eight pounds of pure gold, was found in Cabarras county, North Carolina, in 1803.

The *St. Louis Republican* says, that the Iron Mountain Railroad brings into that city more car loads of freight than any road terminating there.

The new iron used on the Iron Mountain Railroad is of the T pattern with fish joints and weighs fifty-six pounds to the yard.

A machine shop in Lowell is building a lathe that will weigh seventy tons when completed.

The snow along the line of the Grand Trunk Railway, in Maine, is in many places higher than the tops of the cars.

The boot and shoe manufacture is everywhere progressing with the utmost briskness.

The snow fall in Montreal during the month of February is said to have been seventy-three inches.

Oregon has twenty-one quartz mills in operation.

Nevada has a million and a quarter mulberry trees.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

CAR DOOR.—Thomas R. Leighton, Cameron, Mo.—This invention consists in a lower door, which is attached by hinges to the bed frame of the car, so as to open outward and downward, and thus form a short platform as part of the car.

EXTENSIVE PRUNING SHEARS.—John Stark, Thomasville, Ga.—This improvement relates to lever shears for pruning fruit and other trees, whereby the shears may be extended so as to be used as either hand or pole shears.

COOKING STOVE AND RANGE.—E. C. Little, L. E. Clow, and D. H. Nation, St. Louis, Mo.—This invention relates to improvements made in cooking stoves or cooking ranges, whereby they are made much more useful and economical than stoves or ranges of ordinary construction.

MARBLE SAWING MACHINES.—C. H. G. Pease, Danbury, Conn.—The object of this invention is to accomplish the sawing of marble and other stone in circular blocks, with a simple and effective apparatus. It consists in suspending the block to be sawn in trunnions before a horizontal reciprocating saw.

PEA RAKE.—Sylvester Skinner, Clayton, N. Y.—This invention relates to a new and useful improvement in pea rakes, and which consists in a malleable iron socket or a double ferrule welded, or otherwise joined to a curved brace or extension of the same material, which is connected to the rake head by rivets, or in other suitable manner, thus forming a suitable bend or curve, so that the handle will need no crook or bend to put the head and blade in a proper angle for cutting, and furthermore, will not loose its bend or curve as the ordinary bent wooden handles invariably do after using but a short time.

ROAD SCRAPER.—Wm. W. Rumrill, Roanoke, Ind.—This invention relates to the construction of revolving road scrapers.

MITER BOX.—John Pons, Baltimore, Md.—The object of this invention is to construct a cheap and convenient miter box, of such a nature that it can be gaged at any angle without difficulty and in a moment of time.

MACHINE FOR MAKING MOLDS AND CORES FOR CASTINGS.—William Hainsworth, Sharpville, Pa.—This invention consists in fastening the pattern in the flask in proper position, and then as the sand is filled in, raising both pattern and flask together to a considerable height and dropping them upon a solid bed, so that the concussion produced by the fall may pack the sand closely and evenly in the flask in and around the pattern.

PEA PROKER.—Abner Quinn, Wilmington, N. C.—The object of this invention is to provide for public use a cheap, simple, and effective machine, to be operated by hand or other power, by which pea nuts, or the pods of leguminous plants, can readily be separated from their vines and thoroughly cleaned from dirt.

FIRE KINDLER.—M. E. Ezell, Hatchchubbee, Ala.—The object of this invention is to provide for public use a simple, cheap, and convenient instrument by which a fire can be kindled in the stove, or a lamp or gas jet lighted at night without the necessity of any one's rising from bed for the purpose. By means of the same instrument the opening of a door or window may be caused to light the fire, lamp, or gas, the apparatus thereby operating as a burglar alarm.

CHURN.—Manuel Witmer, Cedar Rapids, Iowa.—This invention relates to improvements in the construction of cultivators, the object of which is to provide an arrangement of vibrating and swinging churns.

HINGE.—Wm. Wells, Ashtabula, Ohio.—This invention relates to improvements in hinges the object of which is to provide a locking device for spring hinges whereby the door may be held open; also an improved construction of loose jointed hinges.

COMPOUND FOR PRESERVING HAIR.—A. L. Baker, Newark, N. J.—This invention relates to an improved compound for the hair, designed to preserve it and restore its growth in cases of baldness, which will be designated "Calla Cream."

CORN CULTIVATOR.—D. C. Stover, Lanark, Ill.—This invention relates to improvements in the construction of cultivators, the object of which is to make them more useful than as at present arranged, and it consists in an improved manner of constructing the sulky or carriage and connecting the plow beams to the same.

FEEDING SHOES FOR GRINDING MILLS.—John C. Andrew, Seventy-six, Ky.—This invention relates to improvements in feeding shoes for grinding mills, the object of which is to arrange them so that they will also serve as sieves for separating chaff, dirt, and other foul matter. It also consists in constructing the bottom of the shoe of any suitable reticulated substance through which the fine grains of foul matter may be separated from the good grain, and providing under the said bottom a spout for conveying it away.

STENCIL PLATES.—J. L. and H. L. Tarbox, New York city.—This invention relates to improvements in stencil plates, designed to provide a simple and convenient arrangement whereby the stencil letters may be readily connected together for forming words, and be as readily disconnected for changing their combinations without the employment of frames for holding them when set up, as is now commonly practiced.

MACHINE FOR SCRAPING AND LOADING EARTH INTO WAGONS.—Albert Ward, New Michigan, Ill.—This invention consists in suspending scrapers from the frame of a wagon between the front and hind wheels, by an adjustable apparatus, whereby the front ends of the said scrapers may be let into the earth at any required depth, which scrapers are provided at their rear ends with inclined flaps, up which the earth is forced, and delivered to a carrier operated from the hind wheels of the wagon transversely of the said wagon, and which projects from one side thereof in an elevated position, whereby the earth may be delivered to another wagon moving alongside the scraping apparatus.

BLIND FASTENING.—Wm. J. Decker, Nyack, N. Y.—This invention relates to a new combined apparatus for holding blinds and shutters closed, open, or partly open, for locking them safely to the window frame and sash and or setting the slats. The apparatus is of very simple construction, readily applied to old and new blinds and not liable to get out of order.

FISHING NET.—F. A. Werdmuller, New York city.—This invention relates to a new apparatus for catching fish, crabs, lobsters, and other animals in deep water, and consists of a rigid frame, which forms the upper edge of a shallow bag, and the outer support for a flat ring, both the bag and ring being woven in suitable material. When this net is let into the water, and some bait placed into it, it will form a secure trap for the animals entering it, as the same cannot escape except by direct upward motion, which is scarcely ever attempted, and which is made impossible when the net is being drawn up.

WASHING MACHINE.—H. B. Tibbits, Vineland, N. J.—This invention relates to a new machine for washing clothes; and it consists in the application of a rubber and box bottom of peculiar form and construction, whereby when the requisite motion is imparted to the rubber, a combined rubbing and striking action is produced. The lower face of the rubber is V-shaped and corrugated or roughened. The bottom of the suds box is also V-shaped and roughened or corrugated. The rubber working on it will be drawn from one inclined face of the bottom to the other, and will rub the clothes as it travels on each face, striking or pounding them as it reaches the end of a stroke. The invention also consists in providing a device for supporting the rubber above the box, to allow garments to be put in or removed from the box.

TOY BALL EJECTOR.—E. S. Belton, New Orleans, La.—This invention relates to an improved toy for amusement of children and others, and it consists of a cup or mortar, having a handle for holding the mouth of the cup upward, in which a piston is arranged for suddenly ejecting a ball from the cup into the air.

WATER WHEEL.—D. Holdiman & S. Goodwin, Waterloo, Iowa.—The object of this invention is to provide an improved water wheel of the turbine class. It consists of a horizontal wheel, having the buckets arranged to be acted upon by the direct action of the water, and also by the reaction of the same, having a contracted discharge tube to produce an effect by suction, and a series of adjustable gates arranged to act as expansible sheets to convey the water to the wheel; also an improved arrangement of means for actuating the said gates. The buckets are so constructed as to discharge a portion of the water sidewise toward the center of the same, and another portion downward through the bottom.

TRITURATING AND AMALGAMATING APPARATUS.—Leonard Wray, Rams-gate, England.—This invention of improved methods of, and apparatus for obtaining or separating metals from their ores, matrices, slimes, tailings, or other substances containing them, is applicable to those kinds of minerals, earths, clays, sands, gravels, or conglomerates which contain gold or silver in any form, shape, or combination, and which may or may not require to be pulverized, washed, concentrated, triturated, or amalgamated in order to facilitate the great object of separating and obtaining the precious metals existing in these substances by washing, as in the case of tin, and some other of the refractory minerals, such as auriferous and argentiferous pyrites, sulphides, sulphurets, antimonates, or other combinations containing gold or silver, or by direct amalgamation, as in the case of the precious metals. This improved apparatus for effecting these objects consists of a machine which has for its object to triturate the ore or substance containing the metal until it is reduced to an almost impalpable powder; and secondly, of a machine for washing the mineral matters, and for catching or securing by amalgamation the precious metals, even to those finest particles which, in ordinary processes, float away with the water, and are lost.

BRAID REELS AND GUIDES FOR SEWING MACHINES.—William Carpenter, Fairbury, Ill.—The nature of my improvements relates to the application to sewing machines of a means for supplying braid to be sewed on to the cloth, and for guiding the same in a more perfect and satisfactory manner than can be done by the means now in use; and it consists in attaching to the frame of the machine a braid reel in a position above the work so as not to obstruct or be in the way of the same, and arranging it in combination with guides on a braid foot of peculiar construction, whereby a braid of any width may be easily and truly guided to the needle so as to be sewed to the cloth in the middle, or on either edge, as may be desired, and whereby the angles may be made much more perfect than by the means now in use.

FENCES.—Joseph B. Tedrow, Chillicothe, Ohio.—This invention relates to improvements in fences, the object of which is to render them cheaper of construction, more durable, and to arrange them so that they may be protected from floods when located in river bottoms subject to be overflowed. It consists in providing sectional posts, to be constructed partly or wholly of metal, and joining the sections, either by bringing them together or driving the one into the socketed end of the other. They are also constructed sometimes wholly of metal, and in one piece.

SOLDERING APPARATUS.—Chas. Pratt, New York city, and Conrad Seimel, Greenpoint, N. Y.—This invention relates to an apparatus intended for holding sheet-metal vessels and cans which are to be soldered at their edges; the part of such apparatus holding the same being made adjustable, so that the can or vessel can be immersed in the solder to the requisite depth and be raised out, when soldered, in a straight line, thus preventing the unequal distribution of solder occasioned by careless handling. The invention consists chiefly in retaining the can or box to be soldered, in a proper position by means of a frame or float, which can be depressed and elevated at will, to allow of the can or box being uniformly immersed in and raised out of the solder to the extent required.

CULTIVATOR FLOW.—William Looker, Graham, Mo.—This invention has for its object to furnish an improved cultivator plow, simple in construction, effective in operation, and easily operated, each of the plows operating independently of the others.

CAR AXLE.—E. T. Ligon, Demopolis, Ala.—This invention has for its object to improve the construction of car axles, so as to make them stronger, less liable to break, and less liable to fail or part suddenly when injured, or when there may be a flaw in the metal.

STIRRUP STRAP LOOPS.—A. B. Zellner, Monticello, Ark.—This invention has for its object to furnish an improved stirrup-strap loop, which shall be so constructed and arranged, that, should the rider be thrown or fall from the horse, the stirrup strap may be disengaged from the loop, so as to guard against the person's being dragged by the foot, should it accidentally become caught in the stirrup.

HOEING MACHINE.—Horace C. Briggs, West Auburn, Me.—This invention has for its object to improve the construction of the improved hoeing machine, patented by the same inventor, Nov. 17, 1868, and numbered 84,165, so as to make it more convenient and effective in use.

SKYLIGHT AND VENTILATOR.—George Hayes, New York city.—This invention relates to a new and improved method of constructing and arranging skylights and ventilators on dwelling houses and other buildings; and it consists in securing the glass of the skylight, in a metallic frame without the use of putty or other equivalent material, and arranging it so that all leakage is avoided, and in the method of operating a series of skylights or ventilators, either in a cluster or range.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; beside, as sometimes happens, we may prefer to address correspondents by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at \$3.00 a line, under the head of "Business and Personal."

All reference to back numbers should be by volume and page.

G. W. K., of D. C.—We have seen tolerably good specimens of American Russia-sheet iron, but nothing equal to the imported.

C. A. S., of —Gasoline is so exceedingly volatile that its evaporation can be prevented only by keeping it in hermetically sealed vessels, of non-porous material. You will find answers to your other inquiries in any elementary text-book on chemistry.

J. T., of N. Y.—No substance known can be positively asserted to be a simple substance or element. The possibility of discovering elements in the base metals, which will unite to form the precious metals, of course implies the recombination of those elements to form the base metals.

E. M. S., of La.—A splendid blue writing fluid can be made as follows: Take pure Prussian blue six parts, and oxalic acid one part, mix with a little water and rub it into a perfectly smooth paste. Then dilute with rain water to the proper consistency, and add a little gum-arabic to prevent the spreading of the ink.

R. R., of Ohio, writes us that in the discussion relative to the floating of solid on melted iron, the fact that white or chilled iron will sink and gray iron will float has not been mentioned. Reference to this statement may serve to throw some light upon the discrepancies in experiments as hitherto recorded. We would inform this correspondent in reply to his inquiry that, red hot iron has as high a temperature as the flame generated in the combustion of many substances.

H. and Co., of W. Va.—The "proper speed of a mule saw to cut the most lumber" depends on the quality of that lumber. It will vary according to this circumstance from 200 to 300 revolutions, or double strokes per minute. The proper speed of a circular saw is 9,000 feet per minute for the edge; thus in case of your 54-inch circular saw it would be: 14 feet, the circumference, 9,000 feet, the speed, product by division 648, the number of revolutions. If the lumber is soft wood and clear 700, or even 720 revolutions may be advantageously used.

J. H., of N. J., can bronze his gun barrel by diluting either nitric or sulphuric acid with its volume of water and applying it to the barrel with a rag. Be sure the barrel is perfectly clean. This cleanliness can be assured by washing the barrel with lye or soap suds and rubbing dry with cocoanut husk. Several applications of the acid may be required, but one is usually enough. When the tint is obtained wipe off with an oily rag.

U. E., of N. J.—We do not approve of leading the exhaust steam into a brick chimney stack, as it tends to disintegrate the mortar. It will, however, increase the draft. Better build the chimney higher.

B. H., of Mich.—We have already given detailed descriptions, generally illustrated, of all the notable improved firearms in this country and Europe. They are to be found in back volumes from XIV. up. The galvanic or electro-magnetic battery is fully described in almost any work on chemistry or natural philosophy.

W. W. T., of R. I., says he has a gear of 100 teeth, pitch 18 to the inch, what thread shall he cut on a worm to drive it? If the gear teeth are 18 to the inch, of course the worm must be the same pitch—18. one revolution of the worm moves the gear the space of one tooth.

J. N. H., of Canada, asks where the best smoke consuming apparatus, the best paint and putty mill, and the fixtures for using liquid fuel may be obtained.

D. W. H., of Iowa.—Your explanation of the inside and outside crank pins in reply to the inquiry on page 151, current volume, SCIENTIFIC AMERICAN, is correct, but altogether unnecessary.

A. B., of Tenn.—We cannot understand how you can use the condensed steam for a blast or draft after heating your feed water with it. Condensed steam is water. The capacity of a boiler is increased by heating the feed water—we mean the capacity for producing a given amount of steam in a given time. A pipe one-and-a-fourth inches diameter is sufficient to supply a steam cylinder 6x18 inches unless the pipe is very long, crooked, and unfelted.

J. W. H., of Minn., asks if a belt running at a speed of 2,400 feet per minute will transmit more power than the same belt running 1,600 feet per minute. Of course it must; it requires more power to drive it at the greater velocity and that power is not thrown away. Velocity is one of the manifestations, if not an element, of power.

C. H. P., of Ill.—We have lately published recipes on cements and mullages. The bases of them are starch, gum-arabic, dextrine, or gum tragacanth, dissolved in water and preserved by a small addition of alcohol or acid.

E. E. P., of N. Y.—The occurrence of a partial or complete explosion in a kerosene lamp upon the slight turning down of the wick, may be accounted for by supposing the heat to have generated gas in the lamp,

which could not readily escape, until the turning of the screw opened some small aperture. This view is sustained by the sound you describe as of escaping steam. If the wick was drawn in tight, when saturated with oil it would prevent the escape of the gas, until lowered. The orifices by the side of the burners you describe might easily become stopped by concretion of oil. The best kerosene oil will be converted into gas by heat.

J. B., of Pa.—This correspondent asks how many horse powers are required to drive an eight or ten inch circular saw, running entirely in wood. He says he runs an eight inch saw through one inch board, turning with one hand. The question is indefinite. The speed of the saw, its thickness, whether ripping or cross-cut, the sort of wood sawed, etc., should be known before a definite reply could be made.

M. E. H., of Iowa, says he has laid 4,000 feet of two-inch pipe from a spring which is 30 feet higher than the delivery end, but the water rises at that point only 15 feet. The pipe runs in a straight line, having a descent of 18 feet the first 1,000, the remainder level to the upright delivery. In this case there can be no reason why the water will not rise to the level of the head, less the friction, which, however could not retard the water to the amount of 15 feet. The pipe has a leak somewhere in its length.

H. M. S., of Ohio.—We do not remember one instance in which Congress has ever been asked to repeal a patent. It is not likely that any such application would be acted upon, unless very special reasons could be shown.

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notice exceed Four Lines, One Dollar and a Half per line will be charged.

Velocipede Wheels—10,000—Superior to all others. Send for an illustrated circular and price list. G. F. Perkins & Co., Holyoke, Mass.

To watchmakers and dealers in watches—Wanted, agents in every City, County, & State in America, and all parts of the globe for Arthur Wadsworth's patents. Apply to Patentee, Watch Factory, Newark, N. J.

Manufacturers of coil and other heaters for steam boilers send circular and price list to Reading Hardware Works, Reading, Pa.

Portable engine, 10-h. p., 2-hand. A bargain. Agents for Hoagland's patent lock valve. Address Handel Moore & Co., 5 Pine st.

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Letter-copying Brush—water in handle, enough to make 100 copies. Liberal terms to the trade and to canvassers. T. Shriver & Co. No. 1 Spruce st., New York.

Lillingston Paint, pure white, mixed ready for use. The best, cheapest, most durable and convenient paint ever made. All you have to do is to pour it out and go to work with your brush. All the colors and varnishes mix with it. Address Lillingston Paint Co., 530 Water st., N. Y.

Velocipedes cheap.—Specifications and elaborate drawings, by the aid of which any mechanic may construct a velocipede, together with full instructions for learning to ride, sent for fifty cents. Address M. M. Roberts, Box 3481, Boston Postoffice.

Wanted—Superior spring steel, Solingen preferred, 1-8 of an inch thick, 2½ wide, and 7½ or 8 feet long. Also, wanted, the address of manufacturers and dealers of horse powers and threshers. John H. Hafner, Commerce, Mo.

Etching on saw blades—A cheap and rapid process wanted, to take the place of stamping name, etc. Must be small and neat throughout, and duplicate of each other. Woodrough & McParlin, Cincinnati, Ohio.

Inventors' and Manufacturers' Gazette—a journal of new inventions and manufactures. Profusely illustrated. March No. out. \$1 per year. Sample copies sent. Address Sattiel & Co., Postoffice box 448, or 37 Park Row, New York City.

H. C. Sandusky & Co., General Agents for the sale of patents. Rights, territory, and patented articles sold on commission, 12 Mill st. opposite Postoffice, Lexington, Ky.

Peck's patent drop press. For circulars, address the sole manufacturers, Milo Peck & Co., New Haven, Ct.

The manufacture of sheet and cast metal small wares is made a specialty by J. H. White, Newark, N. J.

The Magic Comb will color gray hair a permanent black or brown. Sent by mail for \$1.25. Address Wm. Patton, Treasurer Magic Comb Co., Springfield, Mass.

For coppered iron castings address J. H. White, Newark, N. J.

Patent right agents please address Box 230, New Britain, Conn., for description of valuable patent for sale on commission.

For portable grist mills and mill machinery, address J. T. Phillips, No. 13 Adams st., Brooklyn, N. Y.

For sale at a bargain—a complete barrel factory, nearly new. Address Hartmann, Laist & Co., Cincinnati, Ohio.

Diamonds or Carbon for mill-stone dressing, drilling, and all mechanical purposes. Also, Glaziers' Diamonds. See advertisement on another page.

Brick clay lands for sale. Apply 19 Cliff st., New York, Room 7.

Pickering's Velocipede, 144 Greene st., New York.

Two-set knitting mill for sale—See advertisement back page.

W. J. T.—We think the patent asbestos roofing manufactured by H. W. Johns, of this city, is the best substitute for tin or slate. It is cheap and easily applied.

Tempered steel spiral springs. John Chatillon, 91 and 93 Cliff st., New York.

For solid wrought-iron beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

Punching and shearing machines. Doty Manufacturing Co., Janesville, Wis.

Responsible and practical engineers pronounce the Tupper Grate Bar the best in use. Send for a pamphlet. L. B. Tupper, 120 West st., N. Y.

Iron.—W. D. McGowan, iron broker, 73 Water st., Pittsburgh, Pa.

N. C. Stiles' pat. punching and drop presses, Middletown, Ct. Machinists, boiler makers, tanners, and workers of sheet metals read advertisement of Parker Brothers' Power Presses.

Winans' boiler powder, N. Y., removes and prevents incrustations without injury or foaming; 12 years in use. Beware of imitations.

The paper that meets the eye of all the leading manufacturers throughout the United States—The Boston Bulletin. \$4 a year