

was attached and wound up so as to propel the disk when released. The trigger which released the spring was connected with an electro-magnet so as to be drawn by it on the passage of the same galvanic shock which fired the gun.

BURNING FUEL.—It is a mistaken idea that large results of heat can be obtained with a reduced combustion of fuel. To get heat there must be combustion, and consequently an adequate supply of fuel.

Recent American and Foreign Patents.

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

SEEDING MACHINE.—Henry Barsalon, Saint Anne, Ill.—This invention consists in a novel construction and arrangement of parts, whereby a very desirable seeding machine is obtained.

CAR COUPLING.—C. C. Cady, West Union, Iowa.—This invention relates to a car coupling of that class which are self-coupling, and it consists in having a fixed hook in each drawhead for the link or shackle to catch over, in connection with a link raiser, spring, and lever applied to each drawhead.

CULTIVATOR.—Henry Barsalon, Saint Anne, Ill.—This invention relates to a device for cultivating corn, cotton, and other plants grown in hills or drills, and it consists of a novel construction and arrangement of parts, whereby the device is placed under the complete control of the operator, and the parts rendered capable of being manipulated with the greatest facility.

BRICK MACHINE.—J. T. Carman, Springfield, Ill.—This invention relates to a machine for molding and pressing bricks from untempered or dry clay, and it consists in a novel means for receiving and discharging the molded clay or bricks, and in an improved means for regulating the feeding of the clay to the molds, and also for pulverizing and granulating the clay in order to insure its being properly fed to the molds; and, further, to an improved means for operating the plungers which compress the clay in the molds.

WATER WHEEL.—W. H. Elmer, Fair Water, Wis.—This invention relates to a horizontal water wheel, and it consists in a novel and improved manner of applying the water to the wheel, whereby several important advantages are obtained.

CULTIVATOR AND SULKY PLOW.—John H. Barringer, Hillsborough, Ala.—This invention relates to a combined cultivator and sulky plow, and consists in the arrangement of the parts in such a manner that they may be readily shifted for converting the machine into either a cultivator or a plow, so that the body and running gear of the implement shall serve for both purposes and thus save the farmer the cost of two machines.

PLOW.—J. and E. P. Miles, Bloomington, Ind.—This improvement relates to a device for preventing a plow from being choked and clogged with grass, weeds, etc., in front of the mold board.

STUMP EXTRACTOR.—David Stauffer, Spring Hills, Ohio.—This invention consists in a cheap and powerful machine for extracting stumps vertically from the ground by means of long and strong double-hand levers, with a very short adjustable purchase, the levers being so arranged as to loosen and raise the stump gradually both by depressing and lifting, with alternate changes of the fulcrum in two sets or rows of holes.

INVALID CHAIR.—James B. Wallace, Franklin, Ohio.—This invention relates to improvements in the construction of an extension chair for invalids, and consists in so forming the back of the chair that it shall exactly fit the small of the back and the loins of the patient when placed either in a recumbent or in a sitting position.

LOCK.—Lewis P. Decker, Williamsburg, N. Y.—The object of this invention is to furnish a lock of safe, cheap and simple construction. It consists in the combination of a female screw, male screw, and pivoted bolt with each other, and with the body of the lock.

HAND CORN PLANTER.—W. C. Lewman, Kansas, Ohio.—The object of this invention is to construct a hand corn planter, by means of which four or eight grains are placed in a hill, each grain or two planted three or four inches apart from the others, in a square.

GATE ATTACHMENT.—W. W. Sutliff, Town Line, Pa.—This invention consists in an arrangement for closing gates by a lever and weight, so that with a small weight upon the gate, it is operated with a lever of different powers, thus increasing or diminishing the force required to open it.

DISTILLING APPARATUS.—Lyman Pray, Charlestown, Mass.—This invention relates to a still, the fire chamber or arch of which is provided with two or more shelves, forming separate heating chambers one above the other, each of which connects by a suitable flue with a smoke stack, such flues being provided with dampers in such a manner that by means of said dampers and shelves the heat can be confined to the level of the liquid in the still, or nearly so, and the scorching of the vapors can be avoided without difficulty.

STEERING WHEEL.—Eben S. Coffin, Boston, Mass.—The object of this invention is to so improve the construction of the steering wheel as to overcome the tendency, especially in a rough sea, by its sudden thrusting motion, to take the tiller out of the helmsman's control, and make his labor exceedingly toilsome and dangerous.

COTTON-BALE TIE.—J. C. Lee, Gonzales, Texas.—This bale tie consists of a metallic band having one end bent in such a way that it will be firmly secured upon the bale by inserting the bent extremity between the bale and the encircling portion or main body of the metallic band.

PORTABLE FENCE.—Daniel Unthank, Spiceland, Ind.—This invention relates to a fence of that class which are commonly termed portable fences. It consists in constructing the fence in such a manner that it not only may be erected or put up with the greatest facility, but also be firmly secured in position when erected, and capable of being adjusted to suit the unevenness of the ground on which it may be placed, and also capable of having angles or corners formed without any difficulty whatever, and having any panel used as bars to allow wagons or carts to pass into and out from a field.

SELF-DUMPING MINE CAR.—Joseph W. Bancroft, Philadelphia, Pa.—This invention consists in an improvement in mine cars which are exclusively used in colliery slopes, underlying shafts on the dip of a coal seam, where the angle of descent exceeds twenty-five degrees.

DIES FOR IMITATION OF STRAW GOODS.—J. S. Kendall, New York City.—This invention relates to a method of procuring dies and counter dies for the purpose of embossing fabrics to imitate straw.

FLY TRAP.—Henry H. Potter, Carthage, N. Y.—This invention consists in an arrangement of pans and wires combined with springs, by which an effective trap for the destruction of house flies is made.

HAND SAWING MACHINE.—J. M. Marston and H. R. Huling, Roxbury, Mass.—This invention has for its object to furnish an improved hand sawing machine, by means of which sawing may be done easier, better, faster, and consequently cheaper than by other machines.

DITCHING MACHINE.—George Sullivan, West Liberty, Ohio.—This invention relates to the manner in which spades of a peculiar form are forced into the ground at any desired angle, and the spades being attached to a crane, the earth can be raised and deposited wherever desired.

FEED MECHANISM FOR SAWING MACHINES.—J. L. Beers, McAllisterville, Pa.—This invention relates to an improvement in the feed mechanism of sawing machines, and it consists in the employment of two pawls and gearing, arranged in such a manner that a continuous feed is obtained, and one which may be regulated to suit the speed of the cut of the saw as may be required.

CULTIVATOR.—R. B. Parks and J. R. Parks, Neponset, Ill.—This invention relates to a cultivator of that class designed for cultivating crops which are grown in hills or drills, and it consists in a novel construction and arrangement of parts, whereby the driver will have full control over the plows, so that the latter may be moved or adjusted in a lateral direction to conform to the sinuities of the rows, and also raised and lowered to regulate the depth of their penetration into the earth.

SAW MILL.—Albert Buell, West Leyden, N. Y.—This invention relates to a saw mill, and consists in simple devices for holding the log in place, instead of dogs, and for adjusting the head-blocks against the log in such manner that it can be sawed bevelling, with one edge thick and the other thin, for siding.

LAMP.—Francis Burrows, Troy, N. Y.—This invention relates to a lamp, which is more especially designed for use in the laboratory, and in which highly combustible fluid is burned; the construction of the wick-tube and the provision of a water-chamber, serving to keep the heat from the oil and prevent explosion.

PACKING RINGS FOR BALANCED STEAM VALVES, AND OTHER PURPOSES.—W. B. Robinson, Detroit, Mich.—This invention consists in so constructing the packing rings of balanced steam valves that the bearing surfaces shall be reduced so that a steam joint may be much more easily made when the valve is in motion than formerly.

AMERICAN TRIPOLI.—Thomas J. Platt, Newark, N. J.—This invention relates to certain substances which, when combined together in the manner specified form what is designated American tripoli, an article which has been thoroughly tested by many manufacturers of jewelry and others, and pronounced equal in all respects to the tripoli which has hitherto been imported from foreign countries.

FURNACE.—Virgil W. Blanchard, Bridport, Vt.—This invention relates to a furnace designed for general purposes, and has for its object economy in fuel, simplicity in construction, and an adaptation for the heating of a large volume of air for warming apartments other than that in which the furnace is placed, as well as an adaptation for general use in the arts, such as smelting, wasting, etc.

WATER WHEEL.—Jason Hemenway, Deerfield, Mich.—This invention relates to an improvement in horizontal water wheels, and it consists in a novel application of the buckets, and a mode of adjusting them, whereby the capacity of the issues between the buckets may be varied as desired, and the wheel adapted to work, under the same velocity, with varying degrees of power commensurate with the quantity of water used.

APPARATUS FOR TREATING PETROLEUM.—Alexis Thirault, Williamsburg, N. Y.—This invention relates to an apparatus for treating petroleum, which receives the oil as it leaves the still, and which is composed of a condensing oil from which the oil passes into one or more tanks. These tanks are closed, and they are provided with steam-pipes extending down to different depths so that by letting steam into the oil, an agitation is produced whereby the light parts are carried off and separated from the heavy parts, and at the same time the waste of a portion of the useful constituents of the oil is prevented.

SELF-RENDERING TALLOW CUP.—Thomas Fleetwood, St. Johns, N. B.—This invention is designed to obviate the well-known objection to the use of tallow for lubricating steam cylinders, on account of the gummy matter which accumulates and clogs the action of the piston.

BLACKING-BOX HOLDER.—Amos Wilder, Calais, Me.—This holder is of such a construction that it can be applied to and detached from the blacking box with the utmost facility; and when used prevents soiling the fingers of the hand with the blacking.

COAL SCUTTLE.—Benj. F. Conan (assignor to himself, J. D. Sherrell, and John Sumner), 244 Water street, New York City.—The object of this invention is to produce a coal scuttle or hod whose bottom, by a simple movement of a lever or handle, can be changed from a condition in which it forms a complete, unbroken surface so as to hold coal, ashes, cinders, or refuse matter, which may then be carried in the hod with safety from place to place to the open condition of a grate through which the finer part of the contents of the hod can pass out.

CARPET FOOTSTOOL.—John G. Flagg, Philadelphia, Pa.—This apparatus consists of a disk or plate which is operated by a screw and made to stuff or press the filling tightly into its carpet cover, and retain the same in its compressed state while the carpet is being sewed around it by hand.

STEAM GENERATOR.—Robert Fanes, Maroa, Ill.—This invention consists in constructing a steam generator of a series of pipes provided at each end with transverse openings or eyes, and so securing the whole together that the eyes of one pipe will correspond with the eyes of another pipe of the same kind and size, whereby a communication for water and steam is effected between and through the center series of pipes.

PUNCH.—Richard Hughes, Virginia City, Nevada.—This invention relates to a punch for the punching of sheet metal screens, such as are used in the separation of ores, etc., and the invention consists principally in a novel manner of securing the needles of the punch, in the holder.

NUTMEG GRATER.—L. V. Badger, Chicago, Ill.—This grater is both simple and cheap in construction, and by its use no waste of the nutmegs is occasioned.

SPRING HOLDER FOR WIPING CLOTHS.—Henry Johnson, Chicago, Ill.—This invention consists of an arrangement of spring fingers adapted to be furnished with a wet or dry cloth to be used in cleansing exterior or interior surfaces, dishes, bottles, lamp chimneys, and other hollow articles, especially those difficult to be reached by the hand, and of varying interior diameter.

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: besides, as sometimes happens, we may prefer to address the correspondent 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 put for as advertisements at 50 cents a line, under the head of "Business and Personal."

H. W. H., of N. H.—An enameled surface may be put on soapstone by the process used for enameling iron and copper and probably also by some of the soluble glass preparations. But there are many difficulties in the way of accomplishing all you desire.

G. P. H., of N. J.—For burning oil the ordinary refining process, distillation and treatment with acid and alkali, is very efficient and cheap; we do not expect to see the process supplanted. The natural lubricating oil is, however, materially injured by it, and something new in that line is very much in demand. Filtering through animal charcoal, bleaches this oil without injuring the lubricating quality, but the process is too slow and costs too much.

R. M., of N. Y.—We understand it to be generally conceded that meniscus lenses for spectacles are preferable to other forms.

W. C., of N. Y.—Cascaquilla bark in powder is sometimes put into smoking tobacco. In the form of a fine powder it may be mixed with most of the ordinary fumigating preparations. An infusion of the bark in water or alcohol may be used in the preparation of fumigating paper. . . . Shellac makes an excellent cement for glass, porcelain and earthen ware. The edges to be joined are heated sufficiently to melt the shellac, when it is applied in powder and the edges brought together and closely pressed till the joints are cold. For white or transparent ware, bleached lac should be used.

R. N. L., of Mass.—Plumber's solder is purified and made tougher by stirring into it while melted common sulphur. The foreign matter rises to the surface and may be skimmed off. Lead may be refined in the same way. The sulphur acts mainly by attacking iron and copper; at least that's our theory.

P. H., of N. J.—"If the earth in its orbit [is not passing through a perfect vacuum, why does not the air fall behind it like the tail of a comet? And if a perfect vacuum why does a comet become elongated to many millions of miles in length, as it is well known that all matter in a liquid or gaseous state tends to form itself into a globe by its own attraction?" We believe many of our readers will prefer to cypher out answers to such questions, without any assistance from us. They, the questions, are like conundrums or puzzles which lose their charm, unless there is a pause before the solution is given.

N. L. B., of Me.—There is more demand than ever for a good imitation of ivory. The production of natural ivory has been decreasing while its consumption is increasing, and the market price has been steadily advancing for many years.

S. L., of Wis.—Tin plate is not manufactured in America: we are dependent upon England for what we use. As soon, however, as we shall have found productive tin mines we shall change all that.

J. Q. B., of R. I.—Force, whether exerted as friction or percussion, is a prolific source of heat. Even the compression of gases will produce heat enough to ignite inflammable substances. This may be proved by fitting a piston in a tube having at the lower end a quantity of tinder or light cotton. The pressure of the air in the tube, when the piston is forced rapidly down, will ignite the tinder. So a blacksmith will by percussion heat a piece of nail rod on his anvil red hot and forge a nail from it.

A. B. J., of Pa.—A warped casting may be straightened often by hammering. The convex or rounding side should rest firmly on an anvil, that portion to be struck in immediate contact with the block, and the "pene" of the hammer should be used. This makes a series of narrow indentations and stretches the skin of the iron. But if these indentations are removed by planing, grinding, or filing, the iron assumes its original curvature. Heating nearly red and springing by weights or other mechanical devices will often straighten a crooked casting.

J. H. L., of Mass.—The name copperas comes from copper and that from the island of Cyprus, where first discovered in large quantities by the Greeks. The sulphate of iron commonly known by the term copperas or green vitriol gets its name of copperas from the fact that a solution of it gives a copper color to iron and steel. It can be obtained by dissolving iron in dilute sulphuric acid and evaporating to crystallization.

C. F. B., of Minn., desires to know whether there is any method or mechanism known by which the piston of a steam engine, or any reciprocating device, can be made to have a uniform velocity throughout its stroke. We know of nothing of the sort. It is against the fundamental laws of mechanics. Even the shot in a gun, when it receives the impact of the exploded gases, requires time before its inertia is overcome. You cannot bring a body to rest when in motion without a gradual retardation of its velocity, and to give it a reciprocating motion back requires a gradual acceleration of velocity.

Sundry Answers.—W. W.—Stone Filters are very old. See back numbers of SCIENTIFIC AMERICAN for illustrations and notices of the best.—W. G. S.—Apply at the railroad office in your place.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

A. S. Rager, Jr., New Albany, Ind., asks where he can have metallic checks with numbers, manufactured.

P. Spaw & Co., 58 State street, Albany, N. Y., wish to hear from parties having improved machinery for making paper bags for sale. "Where can I get the best machine for re-cutting a 60-inch circular saw?" A. N. Osgood, Hancock, N. H.

J. A. Wilshire & Co., Memphis, Tenn., desire to know where Griffin's Air Light can be obtained.

R. W. Shriver, Woodland, Barry county, Mich., wishes to communicate with parties who will make churn castings.

N. Spencer, Mound City, Ill., inquires where he can procure a teacher's clock which strikes every five minutes.

Makers of machines for producing straw rope for cores, please address Homer Hamilton & Co., Youngstown, Ohio.

We want a hand belt cutter for blacksmith shop. Keen & McKay, Rock Island, Ill.

Where can a machine for sawing wood with a horizontal saw by horse-power be purchased? Wm. Brown, Jr., Lawrence, Ill.

T. C. T. address J. B. Aiken, Franklin, N. H., for stocking-knitting machines.

Manufacturer, Box 1440, Norwich, Conn., wants to obtain a paper-bag machine.

NEW PUBLICATIONS.

MEMORANDA ON THE STRENGTH OF MATERIALS USED IN ENGINEERING CONSTRUCTION. Compiled and edited by J. K. Whildin, C.E. D. Van Nostrand, 192 Broadway, New York.

In this volume we have, conveniently arranged for reference and accompanied by explanatory plates, the results of authoritative experiments on the strength of materials used in the arts, under varying forms and conditions. Much of the knowledge of the properties of such substances has been the product of recent investigations and is scattered through books, periodicals, and treatises. Here it is all brought together in a form convenient for the practical man. Only five hundred copies have been printed, which is to be the extent of the issue. The book is sold at \$2 per copy. Those who desire to secure it should apply at once.

MODERN MARINE ENGINEERING APPLIED TO PADDLE AND SCREW PROPULSION. By N. P. Burgh, Engineer. D. Van Nostrand, 192 Broadway, New York.

We have received from the American publisher twelve numbers of this work, each number a monthly part, containing two plates, tinted to represent the materials, and twenty pages of descriptions. Typographically the work is beautiful, the letter press clear and distinct, and the engravings fac simile of real engineering drawings properly colored. It is not a mere theoretical treatise, of value mainly as a curiosity, but a practical work by which the engineer and mechanic may correct their errors, or, at least, understand by the example of others the reasons of failure. Although from a slight examination of the work we may be compelled to differ with the author in some of his statements, we think his deductions from actual experiments and his illustrations of practice are mainly sound and eminently instructive. We consider the publication one of real value to the marine engineer, and of great use to the mechanic desirous of understanding the progress made of late years in the steam engine.

EXTENSION NOTICES.

Thomas J. Sloan, of New York City, having petitioned for the extension of a patent granted to him the 26th day of April, 1853, for an improvement in machine for pointing and threading screw blanks, for seven years from the expiration of said patent, which takes place on the 26th day of April, 1867, it is ordered that the said petition be heard at the Patent Office on Monday the 8th day of April next.

Christopher Duckworth, of Mount Carmel, Conn., having petitioned for the extension of a patent granted to him the 28th day of June, 1853, for an improvement in shuttle-box motion in looms, for seven years from the expiration of said patent, which takes place on the 28th day of June, 1867, it is ordered that the said petition be heard at the Patent Office on Monday the 3d day of June next, at 12 o'clock, M.

Improved Steam Leach.

It is well known to tanners and persons employed in extracting essences of vegetable substances by decoction, that the processes usually made use of are not effective in eliminating the full strength of the material. The best spent bark—oak and hemlock—still contains more or less of the principle called tannin, which is thus wasted. To effect a more perfect extract and to facilitate the operation is the object of the improvement represented in the engravings. The leach tub may be of metal, or of wood strengthened with hoops and braces, like that shown in the engravings. It is suspended through a floor or a frame, A, at a sufficient height to allow the bottom to swing open for discharging the mass after the leaching is completed. The bottom is hinged, as at B, and held in place when closed by the catch, C. It is also secured to the top by rods with nuts, and both top and bottom are packed on their rims by suitable flanges of elastic material. The true bottom is furnished with a false bottom of copper or other suitable material perforated with minute holes, as at D, and raised slightly from the inside of the main bottom. This forms a sieve to retain the bark, while the liquid extract finds its way through the fine holes and is discharged at the center through the pipe, E, the bottom being slightly concave, or furnished with radial grooves for channels, converging to the pipe in the center. The top of the tub may be readily raised by means of the line, pulleys and weight as shown.

Figs. 1 and 2 represents the leach in two positions, and Fig. 3 is a sectional view with boiler attached. By this figure the operation of the apparatus is easily comprehended. The tub is nearly filled with the bark, or other material to be treated, and the top and bottom secured, when steam is admitted through the pipe, F, and rapidly softens the mass. Water is then introduced from near the bottom of the boiler by the pipe, G, and distributed by means of the rose sprinkler over the surface. This combined water and steam quickly permeates the mass; and the decoction filtering through the perforated false bottom is discharged at E. By keeping the steam on continuously and introducing the water at short intervals the best results are obtained, the mass being constantly heated and saturated with steam and hot water. The apparatus appears to be also well adapted for cooking food for cattle, as the work can be done quickly and effectively.

Patented through the Scientific American Patent Agency Aug. 14, 1866, by N. Spencer Thomas, of Painted Post, N. Y., whom address for additional particulars.

Improved Steel-headed Rail.

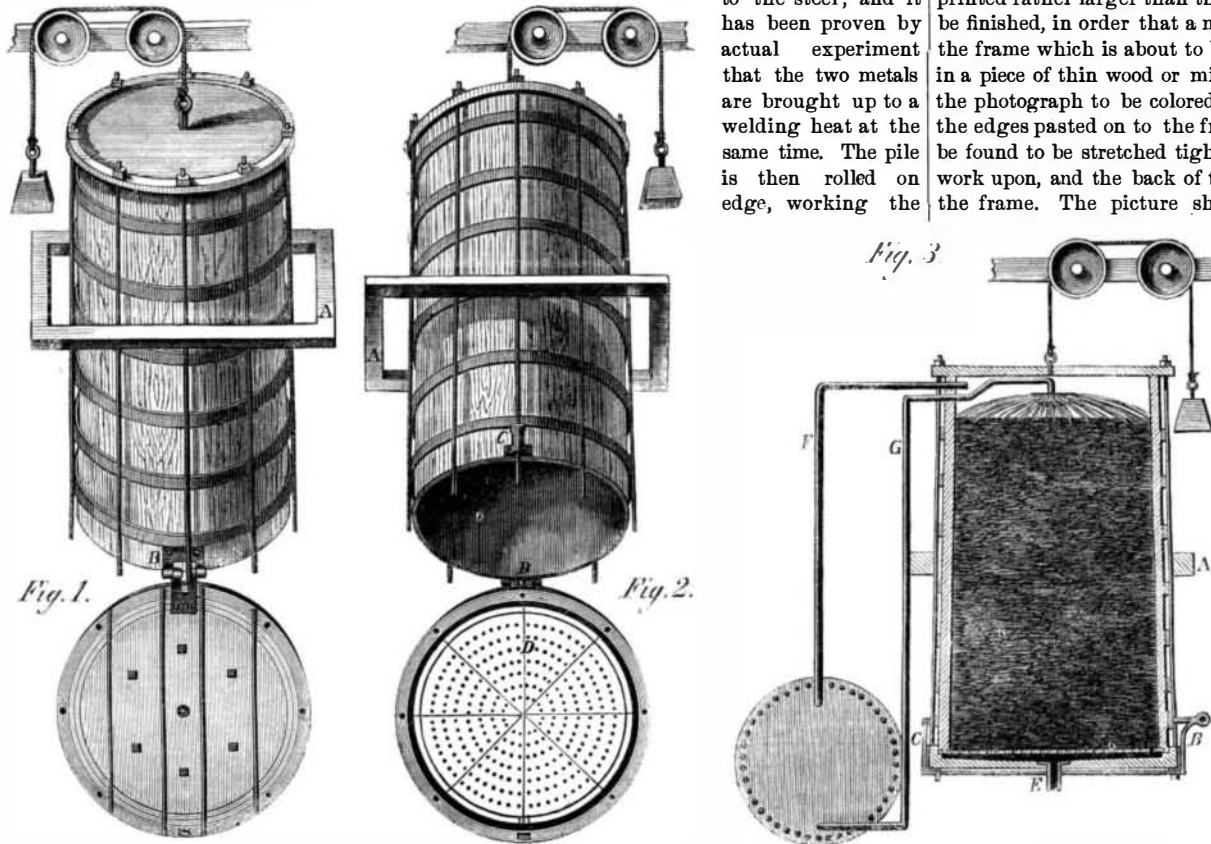
It is generally conceded by railway engineers that Bessemer steel rails will wear about sixteen times as long as common iron rails. If such be the fact, it is a matter of the utmost importance that railway companies renew their roads with steel rails or steel-headed rails as soon as those already in their tracks are worn out. Some of the first engineers in the country have expressed themselves in favor of steel-headed rails, provided the steel head could be welded perfectly to the iron; as in this country the weather is so intensely cold in winter that rails made entirely of steel are very liable to break. It is well known to all that until quite recently steel-headed rails have proved a failure, for the reason that it is such a difficult matter

to heat a rail pile composed of iron and steel according to the usual mode of piling; as the iron requires about double the heat to bring it to a welding state that steel does: consequently either the iron is not heated sufficiently to weld, or the steel is over-heated, which destroys its properties altogether: in either case the rail is unfit for use. As a general thing, the iron is not heated hot enough to weld to the steel, and the result is, that in a few weeks the steel cap separates from the iron, and the rail is rendered worthless.

S. L. Potter, Superintendent of the Wyandotte Rolling Mills, claims to have discovered a plan by which a pile can be made

of iron and steel, and disposed in such a manner that their iron will receive twice as much heat in the furnace as the steel, consequently, they are both brought up to a welding heat at the same time, without injuring the properties of either, and a perfect weld is secured.

By referring to Fig. 1, a section of the pile, it will be seen that a billet of Bessemer or other steel, A, about five inches by four inches—having been previously rolled or hammered from ingots seven or eight inches square—is introduced into the side of an ordinary rail pile, and charged into the furnace with the steel toward the flue, thus protecting the steel with the iron from the extreme heat. As it passes over the bridge from the fire chamber, the heat passes through the iron to the steel; and it has been proven by actual experiment that the two metals are brought up to a welding heat at the same time. The pile is then rolled on edge, working the

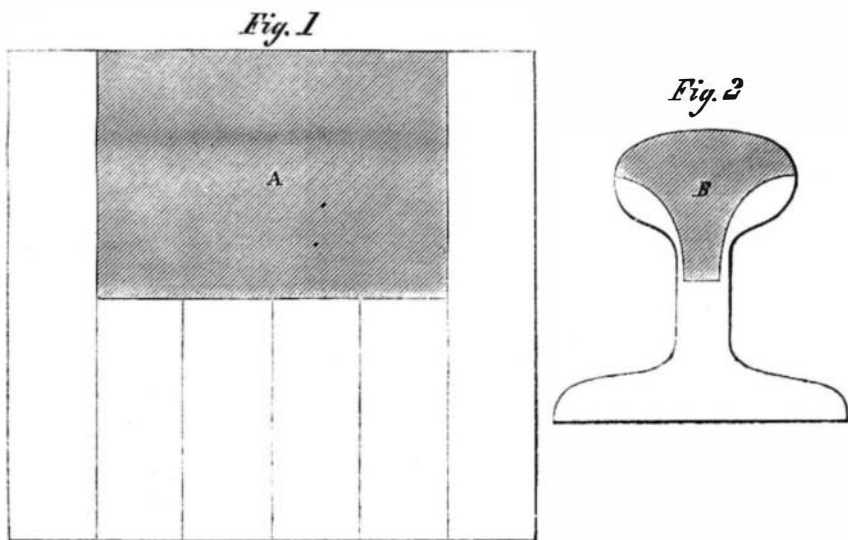


THOMAS'S PATENT STEAM LEACH.

steel in the head. In the first passages through the roughing rolls, a portion of the iron on either side of the steel is worked down in the lower part of the head, allowing the steel to form the head, as shown at B, Fig. 2.

More than fifty different pieces of rails made after this plan, have been subjected to one hundred blows from a two-thousand-pound steam hammer, literally crushing them, without impairing the weld in the least degree. Some of these rails are now in the track of the Michigan Southern and Northern Indiana Railroad, Michigan Central Railroad, and Detroit and Milwaukee Railroad, and have thus far given entire satisfaction. This plan is peculiarly adapted to re-rolling, as the old rails can be rolled into flat bars, then formed into a pile of the iron and steel as shown in Fig. 1. The old rails can at a very moderate cost be converted into a steel-headed rail, one-third of which being steel, and two-thirds iron that will be as durable and much less liable to break in cold weather than an entire steel rail. If it be preferred, a T-shaped piece of steel can be used instead of the square piece, and the same result obtained.

This invention is patented in the United States, England,



PATENTED STEEL-HEADED RAIL.

France, Prussia, and Belgium, all of which patents were procured through the Scientific American Patent Agency. For further information address S. L. Potter, Supt. Wyandotte Rolling Mills, Wyandotte, Wayne County, Mich.

THE differences in metals is surprising. Although copper alloyed so as to come under the term bronze, has been made hard enough to receive and retain an edge, so as to be used for cutting instruments, yet it is softened by being heated and plunged in cold water, while iron and steel is hardened by precisely the same process.

Imitation Ivory Miniatures, Photo-Chromographs, Etc.

A method of coloring photographs intended to be set as brooches or in lockets, in imitation of ivory miniatures, has recently excited great admiration, and has been extensively employed by a few photographers, but, having been kept as a secret by those who have attained a knowledge of the method, it is not known to the general body of photographic colorists. The effect produced is so exactly like that obtained on ivory, that it is only by those who have had great experience in colored miniatures that the difference can be detected.

The method of proceeding is as follows:—The photograph to be colored, which must be on plain salted paper, must be printed rather larger than that part of it which is required to be finished, in order that a margin might be left to paste on the frame which is about to be described. An aperture is cut in a piece of thin wood or mill-board larger than the part of the photograph to be colored; the print is now damped, and the edges pasted on to the frame. When dry, the paper will be found to be stretched tight, exhibiting a smooth surface to work upon, and the back of the part required will be clear of the frame. The picture should now be painted in water

colors, as described in a former part of this work, with the exception that the colors must be more forcible, and the face of the portrait darker than will be necessary in the finished result; the after operation making the picture paler than before the wax is applied.

When the picture is quite finished—and it is well to avoid any further alteration or corrections—melt a little pure white wax in a porcelain capsule, and, holding the picture before a fire, apply the wax to the back with a brush. The picture will appear to darken all over, but will regain its color on cooling. It should now be cut out of the frame and backed with a piece of warm tinted or cream-colored paper. If any alterations are absolutely necessary, they may be made by mixing a little soap with the colors employed, which will prove effective.

Another method on the same principle, but requiring less artistic skill, consists in coloring very forcibly and rudely one print which is mounted on cardboard. Another print from the same negative, printed somewhat lightly on thin, fine paper, and not toned too black, is made transparent either with wax or varnish made with Canada balsam and turpentine. This is stretched tight upon the face of a good piece of colorless glass, to which it is attached throughout with the varnish. It is then fitted so as to superpose accurately upon the roughly painted copy: the transparent print has the effect of softening and blending all the harsh coloring in the original, and giving a good effect with very little expenditure of skill or time. Care must be taken, however, that while the glass and transparent print superpose accurately, they must not be quite in contact with the roughly colored print: a strip of card must be pasted at the edges of the latter, the thickness of which strip divides the transparent print from the colored one, and gives a great appearance of relief and softness.

Another method on the same principle consists in first making the print transparent with wax or varnish, and then coloring at the back in oil colors forcibly but roughly. The print is then mounted and varnished with mastic varnish, and has the effect of a picture colored in oil.

Another method on the same principle yields, with skill and care, very pretty results, resembling enamel. A print on glass, by the Simpsontype or colloio-chloride of silver process, is produced, and, when dry, is coated with a solution of gelatine with which a little Chinese white from a tube has been mixed. When this is dry, the picture is colored at the back, on this gelatine surface, with either water or powder colors. If with the former, the gelatine surface should be first coated with collodion, to prevent it working up: if with powder, the instructions in the chapter on "Non-inverted Colored Positives" should be followed. A little practice will be necessary to ascertain the depth and tint to be applied, as the result can only be guessed at in course of coloring. When done, a piece of gelatinized paper is pressed into perfect contact with the picture, avoiding air bubbles; this is left to dry, and then the whole is removed from the glass by running a penknife around the edge, and a brilliantly-colored miniature, with an enamel-like surface, is obtained. The glass may be prepared with an almost imperceptible coating of wax dissolved in ether, before it is coated with colloio-chloride, in order to facilitate the whole readily leaving the glass when finished.—Newman's Harmonious Coloring.

STEREOCHROMY.—We have given in the SCIENTIFIC AMERICAN (page 22, present volume) a full account of the process of monumental painting employed by Kaulbach at Munich. We observe that Dr. A. Hill of Norwalk, Conn., has recently patented a process for painting on marble, by which it is claimed that the colors are rendered as durable as those of stained glass; the process being at the same time simple and quickly performed.