

he insists that "the crystallization in iron or any other metal can never take place in a cold state. To form crystals at all, the metal must be highly heated, or nearly in a molten state."

The opinion is quite prevalent among engineers and men devoted to science, that tough metals in a cold condition do become crystalline and very brittle, when subjected a considerable period of time to tension and vibrations. The breaking of the axles of railroad cars, the piston rods of engines, and the iron stringers of bridges, is oftentimes attributed to the metal becoming crystalline. But, while Mr. Roebing is a disbeliever in the crystalline theory of vibrations, he admits that tension and vibrations impair the strength of iron while it retains its fibrous character. This, he considers, is due to a separation of the threads of the pure iron, and the *cinder* with which it is combined, by the vibrations, thus destroying the cohesion of the particles. This is a most interesting question, and the opinion of Mr. Roebing is of great weight in the matter. He asserts that the cables of the Niagara bridge are made of a superior quality of metal; that they possess an abundance of strength; are free from vibration; that they are well-preserved, and may be safely trusted for a long series of years. As iron, in large structures, has been applied only in very recent years, long experience on a large scale has not yet been obtained; but, so far as that experience goes, Mr. Roebing is of opinion that "good iron, not overtaxed by tension and vibration, and otherwise preserved, will prove one of the most durable building materials at our disposal."

CREOSOTING RAILROAD TIMBER

The facility with which timber can be worked into almost every variety of form, the fibrous and elastic character which it possesses, combined with great strength in proportion to its weight, renders it unrivaled as a material for many purposes. With its many good qualities, however, it has a number of inherent defects, such as combustibility when exposed to high temperatures, and proneness to early decay when exposed to moisture and the atmosphere. In bridges, ships, and other structures, it commences to decay from the very moment it is exposed. When placed in dry situations it endures for quite a long period, but when situated, like railroad timbers, partly above and partly under ground, exposed to air, heat and rain, its life is of very brief duration. The vast expenditures incurred for railroad timber—the sleepers of which have to be renewed every few years—have naturally drawn much attention towards the discovery of some process to render it more enduring. The *Kyanizing*, *Payenizing* and *Burnettizing* processes, for infusing the chlorides of zinc and mercury and the sulphate of copper into the pores of wood, so as to coagulate its sap and render it insoluble, have all been tried with more or less success, but recent experiments in England with creosote seem to give it the palm as a preservative agent over all other substances which have been heretofore used. On the Buckinghamshire Railway about ninety thousand sleepers that had been treated by the above-named three processes, and about thirty thousand prepared with creosote were laid down, and it was found that the latter were far more durable than the others. Timber which had absorbed about eight pounds of liquid creosote to the cubic foot was apparently as sound at the end of five years as when first treated. It has also been stated that this peculiar substance not only prevents the decay of timber that has been treated when in a sound condition, but it also arrests decay after it has commenced in timber. This is a most valuable condition, and its reliability has been tested on quite a large scale on the Great Northern and the Lancashire and Yorkshire Railroads (England), on which roads creosoted timbers, that have been down for ten years, appear to be as good as when first laid.

This is an important question for our railroad companies; they may have their timbers creosoted on the very spots where the trees are cut down in the forests. Creosote is a product of the distillation of wood in retorts, and it receives its name from its well-known power to preserve animal substances by coagulating the albumen. It is a liquid which may be made from the refuse or useless parts of the very trees that are chosen to make railroad timbers. It can be kept in wooden tanks into which the timbers may be placed and sunk by weights so as to steep them for several days under the

liquor. Creosote has a pungent odor, but this is not very objectionable; it is the same as that which flavors smoked ham, and to many persons it is far from being disagreeable. All timbers for bridges, the sills of buildings, and the sleepers of railroad tracks should be treated with this substance or some other equally as good, if there is any. The refuse creosotic compounds of coal oil—those which are obtained from distilled coal as well as from the natural oil wells—may be as powerfully antiseptic in their nature as creosote distilled from wood. Experiments should be made to determine this, because such products are now thrown away as waste, whereas they may be usefully applied to render exposed timber ten times more enduring than it now is, and thus save millions of dollars to our country annually.

CONTRACT FOR A STEAM FIRE ENGINE.

We take the following common-sense, practical suggestions from the *New York Times*. There is one very great and unquestionable advantage of free institutions and a free press; they furnish the government with the whole combined knowledge and wisdom of the community:—

To the Editor of the *New York Times*:

I see by your paper of last Friday that there was no bid for the building of a steam fire engine for Hose Company No. 5. I believe the reasons are, that the advertisement was not conspicuous, being mixed up with street contracts; that the time was too short, and that, so far as one builder is concerned, the specification of a cylinder not less than 6½ inches bore by 8½ inches stroke, deterred him from bidding, his engine being rotary. I know one establishment that was disposed to bid for the contract, but had only five days notice, which was not sufficient to make an estimate, unless the design had been already made. A month would be but a moderate time for a shop not already in the business, to propose a plan and estimate upon it; and I respectfully suggest that the authorities should allow this time, and more, if they can spare more.

I further suggest that the printed forms should be sent to all the fire engine builders and to the principal machinists, and that the proposal should be advertised and also noticed in the *SCIENTIFIC AMERICAN*, and other papers that go to machine shops. I do not believe that two out of twelve or more shops that build steam fire engines knew that this matter was open to them, or could have been able to make their bids in time. The reference to a particular New York engine, as to size and style, would make it necessary to see that engine in order to estimate properly.

I would further suggest that the specification should be revised, the work to be done fully stated, and no reference should be made to the engines now in use, to render a journey to New York necessary as a condition of being able to make an intelligent estimate.

Yours, respectfully,

AN ENGINEER.

THE FAIRS OF 1860.

We take the following full list of the agricultural and mechanics' fairs of this Fall from *The Country Gentleman*, omitting those which have already been held:

NATIONAL.	
American Institute.....	New York, open Sept. 27.
STATE.	
Alabama.....	Montgomery, Oct. 29, Nov. 2.
Canada, Upper.....	Hamilton, Sept. —
Connecticut.....	No exhibition on account of cattle disease.
Georgia.....	Atlanta, Oct. 23, 26.
Georgia, Pleasants.....	Macon, Dec. 3, 5, 9.
Georgia, Lower.....	Savannah, Nov. 22, 24.
Illinois.....	Indianapolis, Oct. 15, 21.
Iowa.....	Iowa City, Oct. 2, 5.
Kentucky.....	Bowling Green, Sept. 18, 22.
Kentucky, North Eastern.....	Ashland, Sept. 18, 20.
Maine.....	Portland, Sept. 25, 28.
Maryland.....	Baltimore, Oct. 30, Nov. 3.
Michigan.....	Detroit, Oct. 2, 5.
Minnesota.....	Fort Snelling, Sept. 27, 30.
Mississippi.....	Holly Springs, Oct. 15, 20.
Nebraska.....	Omaha, Sept. 19, 21.
New Hampshire.....	Manchester, Oct. 3, 6.
New York.....	Albany, Oct. 2, 5.
North Carolina.....	Dayton, Sept. 25, 28.
Ohio.....	Dayton, Sept. 25, 28.
Oregon.....	Oct. 2.
Pennsylvania.....	Wilkesbarre, Sept. 24, 27.
St. Louis Ag. and Mech. Association.....	St. Louis, Sept. 24, 30.
South Carolina.....	Columbia, Nov. 12, 14.
Tennessee, Mid. Div.....	Franklin, Sept. 24, 27.
Virginia.....	Richmond, Oct. 22, 28.
Wisconsin.....	Madison, Sept. 24, 27.

HERMETICAL MASTIC OF GRAPHITE.—The preparation of this cement is very simple. A mixture is made of 6 pounds of plumbago, 3 pounds of fine chalk, 8 pounds of the sulphate of baryta, and 3 pounds of linseed oil, well boiled. The black lead, chalk and baryta must be reduced to a very fine powder, and well-mixed with the oil. A cement is thus obtained which, as shown by experiments, is much superior to that made with red lead, and which may be employed with great advantage in luting the joints of steam boilers, water pipes, gas pipes, &c.—*Journal de L'Eclairage au Gas.*

APPLICATION FOR THE EXTENSION OF A PATENT.

Improvement in Drawing Frames.—Eliza Pray, administratrix of Joseph Pray, deceased, and Christopher Stafford, of Plainfield, Conn., has applied for the extension of a patent granted to the said Joseph Pray and C. Stafford on the 12th of November, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 20th of October next; and the petition will be heard at the Patent Office on the 12th of November, 1860.

DR. BRADLEY'S IMPROVEMENTS IN TELEGRAPHING.

On page 274 of Vol. I. (new series), *SCIENTIFIC AMERICAN*, we noticed an improvement in telegraphing, invented by Dr. L. Bradley, now of this city, by which from 10,000 to 15,000 words per hour could be transmitted, in place of 1,500 or 2,000, which had been the previous limit. On applying this apparatus to long circuits, however, Dr. B. found a limit to the rapidity in the action of the relay magnet, and he has since been engaged in improving this part of telegraphic apparatus. He has now a relay which will enable him to transmit 10,000 words per hour. He has also connected this relay with an improved sounding apparatus which enables him to dispense with the local circuits for those who read by sounds. A full illustration of this great invention will appear in our next issue.

MACHINE SHOP ARCHITECTURE.

The illustrated article, published in another part of this paper, on Iron Works—their arrangement, location and construction, will be found worthy of the attention of such of our readers as take an interest in the subject. It is written with intelligence and ability, and will commend itself to a large class of our readers, as the subject is an important one, and has never before been presented in any journal so far as we know. The article, with accompanying plans, will be completed in our next number.

McCORMICK AND THE PRESS.

In our issue of the 25th ult., we noticed the peculiar manner in which the famous inventor of the reaper, Mr. McCormick, became connected with the newspaper press of Chicago. It seems according to the *Times* and *Herald* of that city, that Mr. McCormick did not get the control of the *Times* by the summary process of enforcing certain claims which he is alleged to have purchased against it. The transaction, as it is detailed, shows, that he acted all the while like a straight-forward man.

RECENT AMERICAN INVENTIONS

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

MAGNETO-ELECTRIC MACHINES.

These improvements are for the most part applicable to either of the two common forms of magneto-electric machines heretofore constructed, namely, that which consists of one or more series of helices composed of covered copper wire coiled round cores of soft iron, applied to rotate between or near the poles of a series of stationary permanent magnets, and that which is composed of one or more series of permanent magnets, applied to rotate near one or more series of stationary helices, but all the improvements are applicable to machines of the first-mentioned form. The first improvement consists in the employment of a number of helices in each wheel or circular series proportioned to the number of magnetic poles in each circular series of magnets as three to two, for the purpose of making the attractive force of the magnets always counterbalance the retarding or holding back force. A second improvement consists in the arrangement of the helices of two or more wheels or circular series in a spiral relation to each other, that is to say, so that in a machine having two wheels or circular series of helices each helix of either wheel or circular series is in a line midway between the lines of the two helices of the other wheel, and that in a machine, having more than two wheels or series of helices, the helices of the several wheels are arranged in regular succession at a distance in advance of each other equal to the distance between those of each wheel or series divided by the number of wheels or series in the machine, the object of such arrangement being to bring the helices of the several series alternat-

ely or successively within the influence of the magnets, and to make the influence of the magnets more nearly continuous, or less interrupted. A third improvement consists in the construction of the helices with flat cores arranged radially to the center of the wheel or circular series; and a fourth improvement consists in making the ends or poles of the magnets of such taper form, that their edges are radial to the center of motion, or so nearly so as to be always parallel with the edges of the cores of the helices at the time of their passing. The object of these third and fourth improvements is to make the change of polarity in the core of each helix more sudden and complete, and the electric impulse consequently stronger. A fifth improvement consists in an intensity regulator of novel character by which the quality of the current can be readily varied from high to low intensity, to adapt it to the particular duty required. The credit of these improvements is due to H. N. Baker, of Binghamton, N. Y.

BALANCING MILLSTONES.

The object of this invention is to obtain a ready means by which the revolving stone may be balanced while both in motion and at rest, and the parallelism of the faces of a pair of millstones always preserved. The "runner" or revolving millstone of a pair, when hung on its spindle, after completion, will be found in an unbalanced state, and the plan has usually been to balance the stone by inserting a piece of lead into its top at the light side of it. This plan of course, would balance the stone while at rest, but, when made to rotate the centrifugal force generated by its rotation and the position of the lead, which is above the point of suspension of the stone, causes the latter to be out of a state of equipoise, and hence the parallelism of the stones when at work is not preserved. Again, if the stone be balanced while in motion, but out of balance or state of equipoise when at rest, the unequal density or disposition of weight relatively with the point of suspension, will subject the spindle to considerable lateral strain, and it would be liable to heat and be injured by wear. In order to obviate these difficulties the inventor employs a band or strap, which encircles the "runner" circumferentially with a weight interposed between it and the side of the stone, the band and weight being in or about in a horizontal plane with the point of suspension of the stone, and the desired end is thereby obtained. This device has been patented to D. Fellenbaum, of Lancaster, Pa.

COTTON GINS.

This invention relates to an improved mode of feeding or presenting the seed-cotton to the action of the saws, rollers or other means employed for separating the staple from the seed. The object of this invention is to produce a uniform motion of the roll of cotton within the hopper throughout the entire length and circumference of the roll, and to support or so sustain the roll, that the portion in immediate contact with the saws or other lint-separating device will not be deflected by gravity, or other causes, so as to press upon said device, a contingency which is injurious, especially where saws are employed, as a "cutting" and "napping" of the lint is the result. The invention consists in the employment of a cylinder constructed of light wood or other suitable material studded with radial spikes or teeth, and placed longitudinally within the hopper, whereby the desired end is obtained. The patentee of this invention is H. L. Emery, of Albany, N. Y.

SELF-ACTING WASTE GATE.

This invention has for its object the preventing of the washing away of mill dams by freshets, and by such a means that it will be automatic in its operations, that is to say, self-acting, requiring no special manipulation, and therefore performing at any moment when required its proper function. To this end there is inserted in the mill dam, a gate frame, provided with a gate or gates of suitable dimensions to allow when open the full volume of water to pass through unobstructed, or nearly so, the gates being arranged in such a way that the water within the dam when reaching a certain height, will by its pressure open the gate or gates and pass through, thereby relieving the dam of any undue pressure. This improvement was patented by Sidney Hudson, of Milford, Mich.

THINNING BOARDS.

This invention is an improved machine for planing boards to render them thinner, it is intended more

especially for carriage makers for reducing the thickness of boards to form panels for carriages. The invention consists in combining with a guide and gage box which may be made light and portable, a plane stock carrying a curved plane iron, a feed roller for carrying the stuff up to the cutter, and an adjustable board by which the stuff may be nicely gaged so as to be cut as thin as desirable. The credit of this invention is due to Sharon Case, of Lumpkin, Ga.

ATMOSPHERIC PILE DRIVER.

This invention consists in furnishing the air-lock which is employed to form the cap of the pile in driving, with a supplementary air-lock so applied as to permit the discharge through it of solid matters which may have been taken from within the pile, while the water is excluded by an artificial pressure of air within the main air-lock and pile, without the necessity of opening the main air-lock to the external atmosphere. The inventor of this improvement is W. S. Smith, of Trenton, N. J.

TUCK AND PLAIT FOLDER.

This invention consists in a certain construction and arrangement of the parts of a tuck and plait folder, which provides for its adjustment in a very simple manner to perform the folding of tucks and plaits of various widths and at various distances apart, and for the easy introduction of the fabric to be folded. This improvement was designed by Reuben Brady, of this city.

VEHICLES.

The object of this invention is to make a buggy easy of access from the rear, to avoid the wheels, in case of muddy weather, or an accident by falling under them, should the horse suddenly start. It consists in dividing the seat and box vertically through the middle, and hinging one or both to the floor of the buggy at the back end, said seat being furnished on its under side, with suitable steps which, when the seat is thrown back will serve for an entrance up into, or as a passage out of the buggy, when the seat may be returned to its former position. E. S. Wicklin and J. D. Weaver, of Carlinville, Ill., are the inventors.



ISSUED FROM THE UNITED STATES PATENT OFFICE FOR THE WEEK ENDING SEPTEMBER 4, 1860.

(Reported Officially for the SCIENTIFIC AMERICAN.)

* Pamphlets giving full particulars of the mode of applying for patents, 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.

29,850.—H. N. Baker, of Binghamton, N. Y., for an Improved Magneto-electric Apparatus:

I claim, first, The employment, in a magneto-electric machine, of a number of helices in each wheel or circular series, proportioned to the number of magnetic poles in each circular series of magnets, as described, for the purpose specified.
Second, The arrangement of the helices of two or more wheels in spiral relation to each other, as and for the purpose set forth.
Third, The construction of the helices with their flat cores, arranged radially to the center of motion, substantially as and for the purpose specified.
Fourth, The intensity regulator, consisting of the wheel, F, plates, G, G, coupling straps, m, m, and screws, J, J, or their equivalents, combined substantially as described.
Fifth, Arranging the terminal wires of the helices to pass through the hollow rotary main shaft on their way to the intensity regulator and pole changer, substantially as described.

29,851.—Jonathan Ball, of Elmira, N. Y., for an Improvement in Mode of Preparing Wood for Umbrella Sticks:

I claim, first, The process of curing, consisting of the operations of curing, drying, digesting in hot water, drying again, soaking in hot oil, and drying in hot air, performed in the order specified.
Second, I claim, in combination with the described process of curing, the drying of the wood simultaneously with or by the same operation as the removal of the sap, substantially as described.

29,852.—I. S. Barber, of New York City, for an Improvement in Machines for Turning Ovals:

I claim, first, Supporting the cutter shafts in radial self-adjusting arms in combination with the pattern, arranged substantially as shown, and this I claim whether the driving pulley have the same axis with the said arms or not.
Second, I claim the movable and adjustable pattern guides, whereby various sizes, shapes and widths can be cut from one and the same pattern.

29,853.—W. H. Barber, of Wolcottville, Conn., for an Improvement in Seed Planters:

I claim the arrangement of the wheel, B, ratchets, F, G, clicks, f, g, shaft, C, rockshaft, c, spring, e, hopper, H, spring, h, slide, E, and shares, I, J, as and for the purpose shown and described.
[This invention consists in arranging on the driving shaft two or more ratchet wheels with teeth of different fineness, so that the number and length of strokes of the seed slide can be regulated according to the nature of the seed to be sown and according to the

ground in which the seed is to be deposit d. It consists also in combining the seed slide with a vertical flat spring passing through the center of the hopper in such a manner that by the action of said spring, the seed is stirred, and the filling of the seed cells facilitated.]

29,854.—Thos. Beach, of Freeport, Pa., for an Improvement in Steam Hammers:

I claim so constructing and arranging the piston rod and hammer shaft of steam and atmospheric hammers, as that the hammer shaft shall pass into or through the piston rod made hollow to receive it, in order that the length of the hammer shaft, below the cylinder, may thereby be capable of adjustment, without interfering with the length of stroke of the piston, substantially in the manner and for the purposes set forth.

29,855.—Benjamin Bogue, of Trenton, Iowa, for an Improvement in Horsepowers:

I claim the arrangement of the frame, A, and the wheel, B, the internal lead bars, a, a, and the external lead and division bars, d, and e, substantially in the manner specified, for the purpose of applying horsepower internally and externally to the wheel, as is set forth.

29,856.—Reuben Brady, of New York City, for an Improvement in Tuck and Plait Folders:

I claim the construction of the confining plate, H, when hinged to the lower plate, A, for the purpose and in the manner shown and described.
I also claim the ledge, i, on the plate, P, when arranged to operate as and for the purpose set forth.
I also claim the arrangement of the plate, A, with the plates, F, H, in the manner shown and described, whereby the said plate, A, serves to furnish an even bearing for the tuck being sewed, and also serves as a guide to the tuck last sewed, all as set forth.

29,857.—C. D. Brewer, of Lewisburg, Pa., for an Improvement in Machines for Dressing Millstones:

I claim the use of the plate, N, when the same is made adjustable on the pick carrier, D, by means of the slot, u, and screw bolt, V, or their equivalents, as described, and to operate in combination with the adjustable pawl, I, and lever arm, l, to enable the operator to vary the force of the pick, without varying the feed of the carriage, B, as set forth and described.

29,858.—T. E. C. Brinly, of Louisville, Ky., for an Improvement in Plows:

I claim the arrangement on the standard, D, and beam, A, of the ledges, a, b, and shoulder, h, to admit of the attaching of the standard to the landside moldboard and beam, as shown, in connection with the brace or rod, E, applied, substantially as and for the purpose set forth.

[This invention consists in a novel and improved way of attaching the standard of the plow to the moldboard and landside, whereby a very firm and durable attachment is obtained, and one that will admit of the standard being readily detached, if broken, and a new one adjusted in its place. The invention further consists in a novel arrangement of a cutter and the method of attaching the same to the plow, whereby a firm and stiff cutter is obtained and the durability of the plow increased.]

29,859.—Thos. Byrne, of Baton Rouge, La., for an Improvement in the Preparation of Flour:

I claim the bringing of flour of wheat and other grains in contact with carbonic acid gas, artificially manufactured.

29,860.—Thos. Byrne, of Baton Rouge, La., for an Improvement in Mode of Applying Sulphurous Acid to Cane Juice:

I claim a method by which I treat cane juices with sulphurous acid gas and lime, or sulphurous acid gas and either of the earths, viz., barytes, magnesia, or strontia, so that no sulphite of lime, or sulphite of any of the above mentioned bases shall be formed in said cane juices, as set forth.

29,861.—Sharon Case, of Lumpkin, Ga., for an Improved Machine for Thinning Boards:

I claim the combination with a box, D, having an adjustable bottom operated by set screws, a, a, a, of the feed roller, G, arranged and made to operate as set forth, plane, A, J, and pressure roller, G, the whole being combined and arranged substantially as and for the purposes set forth.

29,862.—C. T. Chester, of New York City, for an Improvement in Electro-Magnets:

I claim, first, In combination with cores confined, so as to prevent the action of the current through a surrounding helix from imparting motion to them, Helices wound on spools of hard rubber or other suitable material surrounding the cores, and so arranged that the cores may be removed from them when requisite, substantially for the purposes set forth.
Second, I claim holding, moving and adjusting the cores by means of the screws and springs, substantially as described.
Third, Coupling and supporting the helical spools by the double rings, substantially as described.

29,863.—L. S. Chichester, of New York City, for an Improved Sad Iron:

I claim a smoothing iron having a hollow spiral self-ventilating handle, and the edges of its rubbing surface provided with a groove, and otherwise constructed or shown and described.

[The object of this invention is to render the smoothing iron or goose much more efficient than those of usual construction, by facilitating the rubbing and pressing operation to which the fabric is subjected, and at the same time preserve all the facilities of the old iron in smoothing or ironing out the small folds in the fabric.]

29,864.—J. M. Crooper, of Pittsburg, Pa., for an Improvement in Revolving Fire-arms:

I claim the use of a locking bolt, such as described, operated by the trigger spring, and trigger working on a collar on the trigger around the trigger pin, so as to prevent its action being interfered with by the pressure of the sides of the lock frame.
The use of a projection at the front end of the trigger, projecting through the lock frame, and pressing against the circumference of the rotating breech, in combination with suitable recesses in the circumference of the rotating cylinder, whereby when the trigger is not drawn back, and the parts are at rest, the cylinder will be secured from rotation in such a position that the end of the hammer will be situated between two of the nipples, and not upon or in front of any of them, thus avoiding in a great measure the danger of a premature or accidental discharge.
Also the arrangement of the trigger, hammer, and vibrating tooth constructed as described for the purposes described.

29,865.—A. B. Crawford, of Piqua, Ohio, for an Improvement in Threshing Machines:

I claim the cellular belt, H, as arranged, in combination with the vibrating belt, I, with the projections or fingers, f, teeth, g, and pins, h, and arms, I', and stacker, E, all operating as set forth and for the purposes described.

29,866.—G. W. Efner and S. A. Sperry, of Ann Arbor, Mich., for an Improvement in Carriages:

We claim the hollow axle, B, in combination with the double spring catch, D, and the manner of operating the same by turning the spring wheel, in the elliptical opening at the outer end of the axle, as a mode of attaching and detaching the wheel.
We also claim the hollow axle, B, in combination with spiral spring, K, spring lever, I, and through brace, M, operating together in the manner described, as a carriage spring.