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Parchment Paper.

The last number of the London *Mechanics' Magazine* contains the abstract of a lecture delivered on the above at the Royal Institution by the Vice President, Rev. J. Barlow. We will give the substance of the lecture in as few words as possible, leaving out no essential particular.

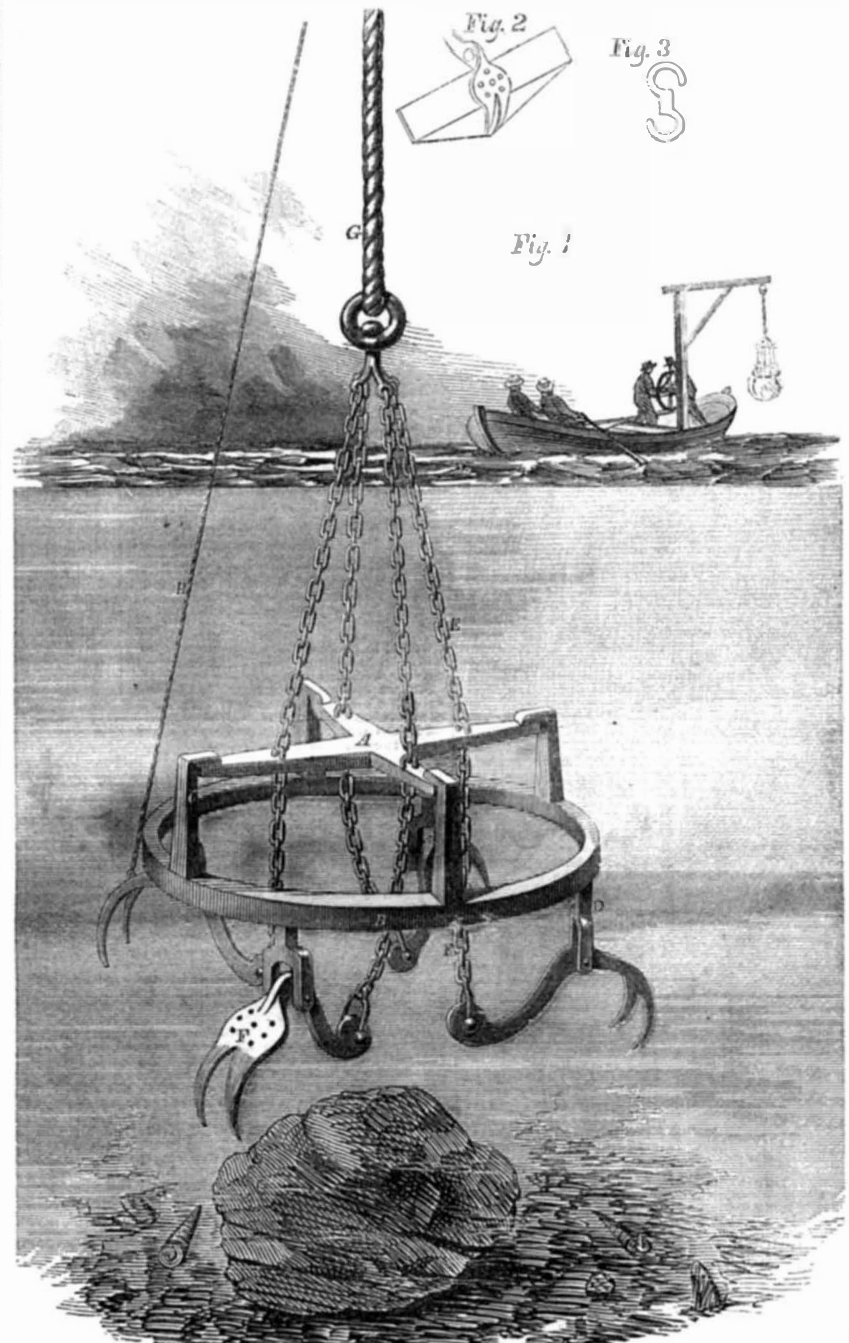
The parchment paper is the invention of W. E. Gaine, C. E., and it is about to be manufactured and brought into public use. This inventor instituted a series of experiments to discover the effects of acids of different degrees of strength upon vegetable fibre; and he succeeded in discovering that when paper is exposed to a mixture of two parts of concentrated sulphuric acid of the specific gravity of 1·854, with one part of water, for a short period—simply drawing it through the liquid —it is immediately converted into a strong, tough, skin-like material. All traces of the sulphuric acid must be instantly removed by careful washing in water. If the strength of the acid much exceeds or falls short of that already stated, the paper is either charred or converted into dextrine, or if it is allowed to remain for many minutes in the sulphuric acid after the change in its texture has been effected. It was stated by Mr. Barlow that in a little more than a second of time, a piece of porous, weak, and unsized paper is converted into *parchment paper*—a substance so strong that a ring of it, seven-eighths of an inch in width, and weighing no more than 23 grains, sustained a weight of 92 lbs., and a strip of parchment of the same dimensions, supported 56 lbs. Like parchment, it absorbs some water, but it does not percolate through it, and it is even indestructible by water.—Printed paper is capable, by this process, of being converted into parchment paper without obliterating the printing. Beautiful photographic pictures were taken on this paper, and exhibited at the Institution.

The process for making this paper is very cheap and simple, but requires great care. It appears to be a most valuable invention. Great quantities of vellum are now required for bookbinding, and much parchment is used for valuable legal documents. It will probably replace these, and perhaps paper for school and other books exposed to constant wear.

More American Pearls.

The Pearl Mussel, as it is now called, is found in the Schuylkill, and, indeed, in all the creeks, rivers and streams of this section of the country; but for the production of pearls, it is said to be indispensable that the water should be impregnated with some such mineral substance as iron, copper or lead. If this be so, Pennsylvania ought to yield an inexhaustible supply of pearls, for her soil is incomparably rich in iron, and there are also mines of copper and lead in the interior. It might be worth while for some of our rural folks to investigate the matter. There is no longer any doubt respecting the genuineness or value of the pearls found in the waters of New Jersey.—*U. S. Gazette.*

STONER'S GRAPPLER AND DREDGER.



The accompanying figures illustrate an ingenious device invented by Augustus Stoner, of Mount Joy, Pa., and secured by Letters Patent granted on March 24th of the present year, the design being to grapple at will by the simple act of lowering upon any object and again hoisting, and also to be capable, by simple means, of releasing its grasp whenever it seizes on an absolutely immovable object. It may also, by changing certain parts, be transformed into a dredger instead of a grappler, and be capable of holding with tolerable tightness a large amount of loose earth.

Four hooks, F, heavier at the shank than toward the point, are jointed as represented to a stout ring, B, so that when B is suspended and the hooks allowed to hang freely, they naturally assume by gravity the positions represented in fig. 1. To the shank of each is attached a chain, E which leads up, and unites above to the stout rope, G, as shown. At an intermediate level on these chains, between F and G, is suspended the iron cross, A, the chains, F, passing through A by the intervention of peculiar links shown separately in fig. 3, so that A is supported without affecting the continuity of the chains. From four points on B, not coinciding with those to which the F hooks are jointed, arise rigid arms, C, bent as represented, so that when the machine is to be lowered the weight of the ring, B, and its dependencies rests on the cross, A, which is carefully placed under the overhanging extremities of C for the purpose, and as the chain is of sufficient length below A, the hooks readily drop into their expanded position as represented. When B rests on the bottom or on any object, a very slight additional slacking of the rope, G, by lowering A frees it from contact with CC, and on being again hoisted A is quite certain to be turned one-eighth of a revolution horizontally, and thus to miss of contact with C, in which case the lift is transferred to the butt ends of the stout hooks, F, compelling them to describe a partial revolution on their jointed points, D, and to firmly grasp or embrace the object within. The boat shown on a smaller scale in the same figure is represented as having lifted an object by this means above the surface.

As any such grappler is liable to seize portions of a large wreck or of a firm ledge which it is impossible to lift, it is of the utmost importance to provide means for unhooking or releasing its hold when necessary. This is done by the aid of a separate line, H, attached to each hook in such a manner that by slackening the main rope, G, and pulling on A the hooks will be compelled to expand. It must, of course, be understood that there is either an independent line, H, extending from each hook quite to the surface, or one main line, H, with attachments, extending to each hook, the intent being to lift or release all the hooks, although to avoid confusion in the illustration, only one of the hooks is represented as capable of being thus moved.

Fig. 2 shows a form of scoop to be substituted for the hooks when the invention is to be employed for the purpose of dredging. These are so proportioned that their points are presented downward and readily enter the soft earth or mud when the apparatus is lowered, and close together into an almost water-tight box when the machine is lifted. By thus changing the parts, the same device makes a very efficient dredger as well as a strong, very tenacious and easily releasable grappler, for all the ordinary purposes to which scoops or tongs of any kind are applied under water.

For further information address Messrs. Stauffer, Stoner & Co., Mount Joy, Pa.

Strychnine and Whiskey.

An Ohio correspondent, who is a distiller, writes to us in reference to the short paragraph on page 286 of this volume, in which it is stated that "the use of strychnine in the manufacture of whiskey is henceforth to be punished as felony in Ohio." It is also stated in the article that by means of tobacco and strychnine "some distillers were making five gallons of whiskey from a bushel of grain, whereas by the old plan they only made two and a half gallons from the same quantity." We gave the article, not on our authority, but in such a manner as to draw out the truth from some of our correspondents. In the New York *Tribune*, and a number of other papers, the above statements were given for facts. Our correspondent denies their correctness. He has never used strychnine, and he denies that it has any effect in producing a greater yield of whiskey. He has the lives of six thousand hogs at stake, in feeding them with distillery refuse, and as all distillers keep hogs in proportion to their business, it would not be to their interest to kill them with strychnine. Certainly not.

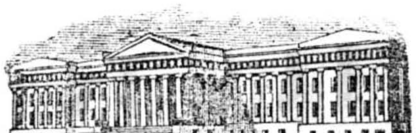
American Nickel.

The Philadelphia *Daily News*, in giving room to the circular of Col. James Ross Snowden, Director of the Mint, appends these editorial remarks on nickel :—

"As appropriate to the issue of the new cent, which, as the reader is aware, is composed partly of nickel, we notice that a new method of concentrating the nickel and cobalt ores has been recently discovered by Theophilus Meny. It is claimed for the new discovery that, whereas it now takes several weeks to concentrate a hundred tuns of ore, producing 30 to 35 per cent, by it the same percentage may be realized in the same time from a thousand tuns. This is, without doubt, a most important discovery, and if found to be really practicable, will add immensely to the works, as well as the stock, of the Gap Mining Company, from the mines of which the supply of nickel now being used at the Mint is derived. The Gap mines produce both copper and nickel in large quantities, and being located within about fifty to sixty miles of our city, they possess a value far beyond any others known to us."

Cultivation of the Sugar Millet.

The Washington correspondent of the Baltimore *Sun* says: "Mr. Wray has commenced a plantation of one hundred acres of his new variety of the sugar millet, called by him Imphee, in South Carolina, on the estate of Governor Hammond." He obtained the seed from South Africa, where it is native.



NEW AND IMPORTANT ARRANGEMENTS.

The rapid growth of our Patent Agency Business, during the past three years, has required a great addition to our ordinary facilities for its performance, and we are now able to announce the completion of a system which cannot fail to arrest the attention of all who have business of this kind to transact.

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will be, as usual, at No. 128 Fulton street, New York. There is no other city in the Union so easy of access from every quarter as this, consequently there are greater advantages in regard to the transmission of models, funds, &c, through the various channels that center in New York. Two of the partners of our firm reside here, and during the hours of business are always at hand to counsel and advise with inventors. They are assisted by a corps of skillful Examiners, who have had many years of active experience in the preparation of cases for the Patent Office.

To render our Patent Agency Department complete in every respect, we have established a

BRANCH OFFICE IN THE CITY OF WASHINGTON,

on the corner of F and Seventh streets, opposite the United States Patent Office. This office is under the general care of one of the firm, assisted by experienced Examiners. The Branch Office is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington having business at the Patent Office are cordially invited to call at our office.

A SPECIAL REQUEST.

Our facilities for the speedy preparation of cases previous to the application for the patent being much more extensive in New York than at Washington, we especially require that all letters, models and remittances should be made to our address here.

EXAMINATION OF INVENTIONS.

We have been accustomed from the commencement of our business—twelve years since—to examine sketches and descriptions, and give advice in regard to the novelty of new inventions, *without charge*. We also furnish a printed circular of information to all who may wish it, giving instructions as to the proper method which should be adopted in making applications. This practice we shall still continue, and it is our purpose at all times to give such advice freely and candidly to all who apply to us. *In no case will we advise an inventor to make application unless we have confidence in his success before the Patent Office.*

Our extensive experience in mechanical and chemical improvements enables us to decide adversely to nearly one half of the cases presented to us for our opinion, before any expense has occurred in the preparation of the case for a patent.

When doubt exists in regard to the novelty of an invention, we advise in such cases a

PRELIMINARY EXAMINATION

to be made at the Patent Office. We are prepared to conduct such examinations at the Patent Office through our "Branch Agency," upon being furnished with a sketch and discription of the improvement. Our fee for this service will be $5.

After sufficient experience under this system, we confidently recommend it as a safe precautionary step in all cases before application is made for a patent—not that there will be no rejections under the system It is impossible to avoid such results in many cases, owing to the exceedingly wide range taken by the Examiners in the examination of cases; but, nevertheless, many applicants will be saved the expense of an application by adopting this course. Applicants who expect answers by mail must enclose stamps to pay return postage.

THE COSTS ATTENDING AN APPLICATION

for a Patent through our Agency are very moderate, and great care is exercised in their preparation. No cases are lost for want of care on our part in drawing up the papers, and if the claims are rejected, we enter upon a speedy examination of the reasons assigned by the Commissioner of Patents for the refusal, and make a report to our clients as to the prospects of success by further prosecution.

A circular containing fuller information respecting the method of applying for Patents can be had gratis at either of our offices.

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We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of their case, enclosing the official letters, &c.

FOREIGN PATENTS.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard Saint Martin, Paris, and 3 Rue Therrsienne, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our agency.

Inventors will do well to bear in mind that the English law does not limit the issue of Patents to inventors. Any one can take a Patent there.

Circulars of information sent free on application.

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[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MAY 19, 1857.

CORDAGE MACHINES—James P. Arnold, of Louisville, Ky: I do not claim giving motion of rotation to the flyers on their own axes by means of a friction band, or by pulleys covered with leather in connection with a circular track, these being old and well known devices, and referred to as such in this specification.

Neither do I claim the circle or ring composed of a series of segments described in the patent granted to Milton Wallwork, April 7th, 1857.

But I claim the combination of a series of two or more pulleys, each pulley arranged to rotate on its own axis, and to revolve around a center common to all, with a ring concentric to said circle of revolution, whose surface adjacent to the pulleys, is elastic, and forms a track for the pulleys to roll on, substantially in the manner and for the purpose set forth.

PORTFOLIOS—Robert Arthur, of Philadelphia, Pa.: I am aware that a letter file is made of a broad band of india rubber, which is used to keep together, by means of its elasticity, a bundle of folded letters.

I am also aware that a file has been made by confining together two stiff boards by means of an elastic cord or band passing entirely around them, or fastened to one board, the papers being put in at one end by drawing the boards apart

I am also aware that a file has been made by confining together two stiff boards, by means of an elastic cord or band passing entirely around them, or fastened to one board, the papers being put in at one end by drawing the boards apart.

I am also aware that an elastic clasp for pocket books, and probably other articles, has been made: these I disclaim.

I claim, first, A portfolio made with an elastic back or hinge, combined with an elastic fastening.

Second, I also claim making the hinge and fastening adjustable for the purpose specified.

PROJECTILES—Christopher C. Brand, of Norwich, Conn.: I do not claim the employment of metal or metallic plugs, or the equivalents thereof made to closely encompass the fuse rope after it has been inserted in the fuse tube or plug.

I do not claim the application of wings to a projectile whether said wings be stationary or movable.

But I claim the improved fuse tube or plug, C, as constructed with two plug chambers, k l, separated by a breech or partition, N, the same being for the purpose as specified.

I also claim the improvement of making said tube, C, with an encircling chamber or recess, o o, arranged substantially in the manner and for the purpose set forth.

DRESSING PIECES OF LUMBER—Harvey Brown, of New York city: I do not claim the saws, planer or jointers separately considered, as they are not new and may be substituted in my invention by other forms of saws, planers and jointers.

I claim the movable, frame E, or its equivalent as supporting the planer, B, and the jointer, C', which by means of the set screws, F F, connect it with the frame, D, by which arrangement pieces for barrel heading or other purposes can be sawed, planed and jointed simultaneously of any desired thickness or width within the compass of the machine, substantially in the manner and for the purposes set forth.

HAND TRUCK—Ze Butt, of Lincolnton, N. C.: I claim the manner described of constructing, arranging, combining, and operating the dumping truck, or any other manner or method essentially the same.

DOGGING LUMBER IN PLANING MACHINES—David N. B Coffin, Jr., of Newton, Mass., and Henry D. Stover, of Boston, Mass.: First, We claim the bar, b, constructed and arranged substantially as set forth, in combination with the rack, c, or its equivalent.

Also the device for the rear end of the platen, so constructed and arranged that the dogging bars are clamped firmly to the platen, at the same time that they adjust themselves to the form and position of the end of the lumber by the operation of a single screw substantially as described.

MACHINE FOR GATHERING AND DEPOSITING DIPPED MATCHES—Thomas Cook, of New York city: I claim in packing matches into boxes automatically, the method of feeding the "dipping board" in connection with the operation of the discharging pins specifically as specified.

I also claim the receiving table, with its gathering and delivering blocks, in combination with the aforesaid means for conveying and discharging the matches from the "dipping board," the whole being constructed and operating specifically as set forth.

GAS REGULATORS—Robert Cornelius, of Philadelphia, Pa.: I claim the employment of the auxiliary spring box, 5 6, communicating directly with the main chamber G, in combination with the valve, 10 11, communicating with the middle chamber for the purpose of preserving the uniform action of my regulator under considerable variation in the main pressure.

TREATING STRAW BRAID FOR HATS, &c.—George Cornwall, 2nd, of Milford, Conn.: I am aware that it is common to smooth braid by passing it between plain rollers, I do not claim such rollers.

Nor do I claim broadly the employment of conical rollers for curving materials of all descriptions, since they have been heretofore used. An example is seen in E. Caiver's patent, 1838, for making circular saws.

But I claim the method of simultaneously beveling, curving, stretching, and smoothing the braid as described.

[Straw braid, according to the common practice, is stretched by the fingers while being sewed together, to form hats. This involves the loss of considerable time, and besides the necessary bevel is not thus given to the braid. The method embraced in the foregoing claim for treating straw braid, gives it the necessary bevel and curve, and stretches it ready to be sewed with greater facility and regularity, producing thereby handsomer straw hats.]

PIANOFORTE ACTIONS—Spencer B. Driggs, of New York city: I do not confine myself to either of the modes of balancing or supporting the centers of motion of the keys represented, or to any other mode of doing it.

But I claim balancing or placing the centers of motion of the keys at, above, or near the top thereof, instead of at the bottom or centre for the purpose specified.

[By placing the centers of motion of the keys in the position stated, the jack acts more directly and more forcibly on the key hammer, especially in the upper portion of its movement. By this arrangement the hammer is also enabled to escape more rapidly, and can also be checked in a higher position, thereby admitting of a quicker repeat

GUNPOWDER—Lammot Dupont, of Wilmington, Del.; I do not desire to claim generally the glazing of gunpowder, or the employment of nitrate of soda in the manufacture of gunpowder, except in combination with the glazing of the powder so made, as aforesaid.

But I claim the manufacture of gunpowder by the use of nitrate of soda, and the glazing of the powder so made, in the manner and for the purpose described.

BLANKET FOR CALICO PRINTING MACHINES—John Fallow, of Lawrence, Mass.: I claim the combination of the short India rubber blanket with the multiple fold of "greys" passing once through the machine, and operating in the manner substantially as set forth.

VIOLINS—Bradley Fitts, of Charlton, Mass.: I claim the application of bells within the interior of or behind the sounding-board of a violin, or other stringed musical instrument, substantially as and for the purpose set forth.

[The bells thus placed behind the sounding-board of a stringed instrument vibrate in harmony with the strings, and thus produce a peculiar and pleasing combination of sounds.]

JOINERS' PLANE—James Lashbrooks, of Owensborough, Ky.: I claim the curved plane iron, C, and cap, F, in combination with the curved back rest and slotted plate, D, operating as described, and for the purpose set forth.

SHUTTLE MOTION FOR LOOMS—Levi Ferguson, of Lowell, Mass.: I do not claim generally the employment of curved guides near the bottom of the picker staves, to direct the upper ends of the staves in straight lines parallel with the warps, as I am aware that plates with curved slots to receive and form guides to studs on the picker staves have been employed, which device is less simple and more expensive in its construction, and does not work with so little friction as mine.

Nor do I claim, of itself, enclosing the retracting spring in a box carried by the rocker shaft.

But I claim the combination, substantially as described, of the rest, e, carried by the rock shaft, the curved sliding guide rod, b, connected with the picker staff, and the box, g, attached to the rock shaft, the latter serving not only to guide the sliding guide rod, but to contain the spring by which the picker staff is thrown back after throwing the shuttle, the whole operating substantially as set forth.

[The top of the picker staff requires to move parallel with the shuttle, in order to throw the latter in a straight line across the race-way. Many devices have been employed (and some of them very complicated) to effect this object. The above parallel motion is accomplished by very simple devices.]

CLEANING GRAIN—J. R. Gates, of Eckmansville, O.: I claim the box, H, divided into two compartments by the partition, d, the fan box, E, and scouring box, A, provided with the stones, B, and rotating beaters, a, when the parts are arranged relatively with each other, as shown.

It being understood that I do not claim separately either of the parts specified, but all the said parts, when arranged and combined so as to operate conjointly, as shown, for the purpose set forth.

[The blast spout, the screen, and the scouring box containing rubbing stones and rotating beaters, are so arranged in this machine as to clean grain in a most perfect manner, and fit it ready for milling.]

RE-DRESSING MILLSTONES—W. Y. Gill, of Henderson, Ky.: I claim the combination of two or more picks, E E, with the guiding and operating screw shaft, B, and lifting cams, h h, when said parts are constructed and arranged and operated in manner and for the purpose set forth.

[With this machine any person capable of turning a crank can redress the lands and furrows of a millstone in a very accurate and expeditious manner. The novelty or invention consists of a number of picks guided and fed back and forth from eye to circumference of the stone by means of a screw shaft, and as they traverse are caused to rise and fall successively, by means of a cam shaft. The chisels, or blades of picks, are so confined that the liability of their being broken, owing to their high temper and concussion with stone, is completely avoided.]

PUMPS—Silas Hewit, of Seneca Falls, N. Y.: I claim the arrangement of tubes, E E, piston head, R, and valves, F' and F², constructed and operated in the manner and for the purposes set forth.

GRAIN AND GRASS HARVESTERS—John H. Heyser & Edward M. Mobley, of Hagerstown, Md.: We do not claim operating the fork, B, by means of cams on the driving wheel.

But we claim operating the cutter bar, O, from the driving wheel, A, by means of fork, B, and arm, E, in combination with rocker, G, and slotted arm, H, when said parts are constructed and arranged to operate in relation to each other, as described.

WASHBOARDS—Edward and Britain Holmes, of Buffalo, N. Y.: First, We claim increasing both stiles of the washboard at the same time, and also entering the zinc into the incision in both stiles at the same time, when the same is done by means substantially as set forth.

Second, We claim raising and lowering the end of the sliding arm, a, at its connection with the vibrating lever, b, for the purpose of controlling the number of blows to be given by the drivers, and the force thereof, when the same is accomplished by means and used for the purpose substantially as described.

Third, We claim the combination of the expanding iron frames, with the wedge and cutters, for the purpose as set forth.

Fourth, We claim the combination and arrangement of the series of levers, g h g h h j k h y and r n, with the pin, g m, and spiral spring, r n s, and hook, l m, or their equivalents, for the purposes substantially as set forth.

Fifth, We claim the combination of the spiral spring K, or its equivalent, with the lever, l, and rod, m, for the purpose of continuing the movement of the lever, l, after the incision is made in the stiles and the cutters withdrawn, so that the stiles will be carried to the zinc, and the zinc entered in the incision made by the cutters, substantially as described.

Sixth, We claim the application of the eccentric, n, in connection with the lever, l, and its arrangements, or equivalents, for the purpose of applying power to make the incision in both stiles of the washboard at the same time, and also to facilitate the entrance of the zinc into both stiles at the same time, substantially as set forth.

REMOVING PHOTOGRAPHS FROM GLASS TO PAPER—Edward Howell, of Ashtabula, O.: I claim the mode of transferring a positive impression from glass plate to paper, or other desired substance, by means of a coating of beeswax upon the glass plate, as described.

FASTENING SHEET METAL ON ROOFS, &c.—Asa Johnson, of Cairo, N. Y., (assignor to himself, William Higbie, and Henry Link, of Little Falls, N. Y.): I claim the self-adjusting fastener, as described, for the purpose of attaching metallic coverings to buildings, and accommodating itself to the contraction and expansion of the metal, and for fastening metals in any and all other places where the contraction and expansion demand accommodation, substantially as set forth, or any mechanical device equivalent thereto.

ROLLERS FOR JOURNALS OF SHAFTS, AXLES, &c.—Wm. H. Main, of Litchfield, O.: I claim arranging the two series of friction wheels at any suitable angle with the line of the journal, so that when they (the said wheels) are placed in a suitable box or wheel, the journal of said shaft may be supported and braced in all directions—the friction wheels having their journals supported by a series of embracing rings, which thus form their rolling bearings, in the manner described

DRESSING SEWING THREAD, &c.—J. D. Minder, of Killingly, Conn.: I do not claim the employment of revolving brushes for dressing sewing thread or yarn.

But I claim the employment for dressing sewing thread and yarns, of a series of straight brushes arranged in pairs, and having a crank motion towards and from each other, so that the several pairs engage and move together along the thread or yarn, substantially as described.

[This manner of arranging and operating brushes for dressing thread and yarn after it is sized, is designed to obviate the use of a blower for this purpose, and to finish the thread in a superior manner to that now done by revolving brushes.]

APPROACH OPENING GATE—Geo. W. McGill, of Buffalo, N. Y.: I claim the combination of levers, G H I K, rack, B, and cog wheel, A, as set forth and described, for operating a gate.

REDUCING ZINC ORES—Alfred Monnier, of Camden, N. J.: I claim the combination of the gas generator and the reducing furnace, H, arranged and operating as described.

RAISING WATER—Andrew Nicol, of Carbondale, Pa.: I claim the rods, F G, provided with the valves, q q, and operated as shown, in combination with the chambers or vessels, A A' B B', suction pipe, D, and branch pipe, j, and the tube, c a b e f, provided with the valves, e d g h, the whole being arranged as described, for the purpose specified.

[This ingenious method of raising water is specially intended for mines. The water is elevated through several chambers having valves, and placed at certain distances above one another. Two sets of conducting pipes and chambers are employed, whereby a continuous stream of water is discharged at the top of the mine.]

GEAR OF CARRIAGES—Richard Murdock, of Baltimore, Md.: I disclaim the short axles and the manner of turning them about their attachment.

I also disclaim supporting the extremities during their movement on stationary train ways.

I also disclaim the swivel bar, c, and boxes, b b, in combination with the short axles, a a, connected with the extremities of the cross bar, as described, this having been secured to me by Letters Patent of the United States, bearing date the 24th day of June, 1856.

I disclaim also all devices in which the fore wheels remain parallel to each other while the vehicle is turning.

I disclaim projecting the brace levers backwards and inwards from the short axles, as that has been done before, and is inferior to my plan, inasmuch as it has a more limited range of motion, and gives less control over the wheels when turning, and greater irregularity in their motion, and increased strain upon the tongue.

But I claim giving to the brace levers, f f, a forward and outward projection from the short axles, substantially in the manner and for the purpose specified.

BASIN FAUCET—Erastus Stebbins, of Chicopee, Mass.: I claim combining and arranging the tubular bearer, K, with the spindle, the valve case, and adjusting screw, substantially in manner and for the purpose specified.

I claim the combination and arrangement of the elevating and depressing cams, or their equivalents, h i k l, and the plane or bearing surfaces, m n, the same being applied to the spindle and valve, and made to operate together, essentially in manner as explained.

ROTARY PLANING CUTTER—Henry D. Stover, of Boston, Mass.: I claim the described method, or its mechanical equivalent, for securing double or single cutting irons to cutter heads, to hold them secure when in use, essentially in the manner and for the purposes set forth.

LIFTING JACK—Wm. Thomas, of Hingham, Mass: I claim the retaining pawl, F, provided with the weighted arm, F', attached to the standard, A, arranged relatively with the pawl, E, and catch, G, substantially as shown, for the purpose set forth.

[In this lifting jack there is an extension bar attached to a lever in such a manner that the jack can be readily adjusted to raise bodies to varying hights without blocking up the standard, as required in operating the common jacks. By an arrangement of a sector with the lifting bars and chains, a nearly equal power is applied to the lifting bars at all points of their movement—a good improvement.]

SHIRT STUD—W. Vogt and J. J. Klink, of Louisville, Ky.: We claim shirt studs or buttons, sleeve buttons, breastpins, or any other article of jewelry or ornament, made with the bar, B, and the hook, C, for the purpose, and in the manner substantially as described.

ALLOWING PLAY TO THE ARBORS OF CIRCULAR SAWS—Harvey R. Wolfe, of Louisville, Ky.: I am aware that springs have been applied to saw mandrels or arbors in various ways, for the purpose of allowing the saw to have a lateral movement or play, and I therefore do not claim such movement in the abstract, or irrespective of the peculiar arrangement of the parts shown and described.

But I claim the bar or lever, F, having an elastic and a stiff or rigid portion, and pivoted to the bar, G, as shown, the elastic end, e, of the bar or lever, F, being connected with the saw arbor or shaft, C, and the stiff or rigid part with the sliding guide, h, through the medium of the rod, H, and lever, I, the above parts being arranged substantially as shown, whereby the bar or lever, F, performs the double function of spring and lever, the saw and guide being both moved laterally when necessary, by actuating the bar or lever, and when the outer end of the bar or lever is secured or made permanent the inner end or part serving as a spring to allow the saw an independent lateral play or movement.

[It is positively necessary for correct sawing that the saw arbor should have some end play. The devices embraced in this claim provide for the proper lateral play of the saw arbor, and for bringing it back to its proper relative position with the log at the commencement of each cut.]

CENTRIFUGAL BATTERY—Albert Potts, of Philadelphia, Pa.: I claim the combination substantially as described and for the purposes specified.

STENCIL PLATE PRINTING—Samuel F. Sanford, of Fall River, Mass.: In the London Mechanics' Magazine, Vol. 57, page 393, 1852, may be found a description of a stencil press, which consists in the use of flat or curved stencil plates, in combination with color rollers, composed of flexible materials, for depositing colors on fabrics through the plates; I therefore disclaim the invention of said device.

But to the best of my knowledge and belief it is new to have the stencil plate made in the form of an endless belt, as set forth.

I claim having the stencil plate made in the form of an endless belt, H, as and for the purposes set forth.

[This method of forming the stencil printing plates in one continuous apron, gives to them something of the character of rotary printing presses, thus rendering them more rapid in operating, and capable of being driven by steam power. Stencil printing is now all performed by hand labor.]

COMPRESSING THE ENDS OF BLIND SLATS—Luther T. Smart, of Manchester, N. H.: I claim the machine substantially as set forth, or its equivalent, for crimping shades to blinds, consisting essentially of the sliding dies, f f, in combination with the cams, j j and m, the rods, p p, the slide, l', and the pressure studs, n n, with the rack, k k, connected together, and operating in the manner substantially as set forth.

SAFETY VALVES WITHIN STEAM BOILERS—George P. Clark, (assignor to himself and Wm. M. Little,) of Newark, N. J.: I claim the arrangement of the inverted valve, c, in globe, A, pressed to its seat by the spring, D, from below the clevis, K, and the escape pipe, I, extending through the boiler, all constructed and arranged within the boiler as described, and for the purpose set forth.

INDICATING THE SPEED OF VESSELS AND DEPTH OF WATER—David Hinman and F. B. Fournier, of Berea, O., (assignor to themselves and R. I. Parker, of Ogdensburgh, N. Y.): We claim the arrangement of the movable wing, D, with its joint, d, the rod, E, and rack, F, combined with the dial or indicator, substantially as described for the purpose set forth.

PRINTING IN COLORS—Wm. Croome, of Brooklyn, N. Y.: I claim the movable tablets for the separate colors, in combination with the guided roller, or equivalent surface, for taking up the inks, operating substantially as described.

I also claim, in combination with the printing surface and with the inking surface, the corresponding guides for insuring the uniform action of the inking surface upon the printing surface, as set forth.

MOWING MACHINES—Thomas Harding, (assignor to Warden, Brokaw & Child,) of Springfield, O.: I claim the combination with a mowing machine of the culiarly constructed truck, A B, when both are arranged to operate in relation to each other, in the manner and for the purposes set forth.

LANTERN AND OIL CAN—Wm. G. Russell, (assignor to himself and Wm. Sewell,) of New York City: I do not claim either a lamp or an oil can.

But in view of the new and useful result obtained, and the security for life and limb by my illuminated oil can, I claim, as a new article of manufacture, the attachment of a lamp or light to an oil can or feeder for illuminating the place to be oiled, substantially as and for the purposes specified.

FOLDING PAPER—Edward N Smith, of Springfield, Mass., (assignor to Steuben T. Bacon, of Boston, Mass.): I claim first, The employment of points or register pins, or their equivalents, for the purpose of correctly presenting sheets of paper to a folding apparatus, substantially in the manner and for the purpose set forth.

Second, I also claim the manner of adjusting the register pins, and their peculiar movement, as described, for the purposes specified.

Third, I also claim combining with the knives or straight edges, or their equivalents, the points projecting beyond the edge thereof, for steadying the sheet while being folded, as specified.

Fourth, I also claim reducing the speed of the succeeding sets of rollers, from first to last, so as to proportion the distance traversed by the sheet at each succeeding fold to the reduction of its size, so that the time the sheets are moving from point to point shall be equal, or nearly so.

Fifth, I also claim the adjustable stop for determining the prop r position of the sheet to receive its second and succeeding folds, as specified.

Sixth, I also claim the combination of the fly with the folding apparatus, for laying off the folded sheets, as described.

Looms—N. B. Carney, (assignor to J. B. Livingston, C. H. Haswell and R. C. Root,) of New York City: I claim, first, the weaving of fabrics within and upon a circular frame, or looms, arranged about a common center, producing the fabric at the central part, the shuttle being carried in a circle round the frame or loom in a continuous movement, the warps, shuttles and filling being placed at the top of the loom and the machinery for operating acting underneath, the weaving being effected by machinery as described.

Second, I claim the combination and arrangement of the machinery described, acted upon and driven by the spur wheel, Q, and its eccentric grooves and their connections by which the sliding frames holding the warp wires or heddles are caused to reciprocate in opposite directions in equal times and regular succession, and the shuttles are made to rotate about the circumference of the loom in a plane perpendicular to the planes of motion of the sliding frames, and in equal times so as to pass between the upper and lower sets of warp threads when apart, thus producing a fabric at the central point.

Third, I claim the combination of the roller covers and barrels, operating together as described.

Fourth, I claim the combination and arrangement or mechanism of the flat wheels or disks with their grooves with ecentrics, cams and connecting rods and slides, the rollers covers the levers, bolts and slides, the levers carrying a motion from the rollers and covers to the warp wires, so as to hold them fast or set them free to move with the frames, the whole operating in conformity with Q and its connections, thereby regulating the pattern, shape or figure of the fabric to be woven.

Fifth, I claim the giving to the shuttle the same continuous line of motion, without any divergence, thus avoiding the danger of injuring the operator or the fabric from an accidental false direction of the shuttle.

Sixth, I claim the form and construction of the shuttle Q', r, as described, having its teeth on the underside or outside of its arc, and also the shuttle, Q, s, constructed so as to adapt itself to the increasing growth of the fabric, and pressing up the filling as described.

Spring Hinge—Dr. Jos. S Smith, of New York City. Anti-dated May 12, 1857: I claim the use ot the center pin, screw pin and capped springs, constructed, secured and operated within the tubular knuckle, having a double lapped joint, in the manner and for the purpose specified.

Electro-Magnetic Fire Alarm Telegraph for Cities—Wm. F. Channing, of Boston, Mass., and M. G. Farmer, of Salem. Mass., assignors to Wm. F. Channing, aforesaid: We claim, first, the signal system described, consisting of a series of signal stations, scattered at intervals through a whole city or town, or any part thereof, and telegraphically connected with a common center or point, or with each other, by one or more signal circuits, by which means a constant communication may be established and maintained between all parts of a city or town, however extended and with the center or centers at which the signal circuit or circuits converge or meet, so that the moment a fire occurs, its existence and locality may at once be known at the center of the system, and efforts for subduing it properly directed.

Second, We claim the alarm system described, consisting of a series of alarm stations, suitably distributed throughout a whole city or town, or any part thereof, and telegraphically connected with a central station, by one or more alarm circuits, by which means a public alarm of the existence and locality of a fire may be given at different points.

Third, We claim, in combination with the alarm system, for striking the number of the district upon the alarm bells, the signal system, for communicating the number of the station at which the fire occurs to all the signalstations, as well as for communicating an alarm to the central station.

Shingle Machine—C. M. Young, of Sinclearville, N. Y.: I do not claim the movement of the bolt, or the manner in which it (the bolt) is presented to the knife, irrespective of the means employed for effecting the purpose.

But I claim operating or giving the necessary feed motion to the block H and bolt L, by means of the laterally reciprocating bar G, actuated by the eccentric grooves, n', in the wheels (f) the bar G, vibrating the block H, through the medium of the bar, I, the block H being provided with pawls (p') which catch into the racks (p) in the frame A, and the whole arranged as described.

I also claim the saws, N N, placed in the frame of sash M, which is secured at the back of the gate B, and operated from the bar G, as described, for the purpose specified.

I further claim the bar, G, when arranged as shown, so as to be driven or operated from the gate B, whereby the several parts of the machine are all made to work automatically as described.

[In this shingle machine saws are fitted in a frame attached to the gate of the riving knife, and they are operated automatically to cut a kerf in the butt of each shingle so as to prevent it from checking as it is riven from the bolt. The knife which rives the shingles is so connected with the bolt feed motion that the latter operates automatically by the reciprocating knife gate.]

RE-ISSUE.

Drying and Pressing Paper—John North, of Middletown, Ct. Patented April 14, 1857: I claim, first, the encasing of the cylinders in part, and attaching of brushes inside of said cases, and the application of saw dust, or other proper substance for the purpose of cleaning the outer surface of the pressing cylinders as specified.

Second, I claim combining two or more hollow steam or heated chests at proper distances apart, so as to admit of the sheets of paper to pass between said chest free and unobstructed by means of endless belts, or their equivalents, for the purpose specified.

Third, I claim encasing the outer surface of the heated chests as combined by non-conducting substances for the purpose of retaining the heat as specified.

Fourth, I claim, in combination with the pressing cylinders as herein described, the drying apparatus consisting of heated chests, between which the sheets of paper are passed on tapes or their equivalents, without touching or dragging thereon as specified.

DESIGNS.

Cooking Stoves—Jacob Beesley and E. J. Delaney, (assignors to Cresson, Stuart and Peterson,) of Philadelphia, Pa.

Stoves—Russel Wheeler and Stephen A. Bailey, of Utica, N. Y.

Churns, Egg Beaters, &c.—J. S. Gallaher, Jr., of Washington, D. C.

Pennsylvania Mechanics.

The mechanics of Lancaster, Pa., have lately given an entertainment to old Martin Shreiner, (ninety years of age,) of that place, a much respected mechanic and fire engine builder. J. F. Reigart, Esq., made an eloquent speech on the occasion. Lancaster has produced quite a number of ingenious and skillful mechanics. In 1776 the first American auger was made in that place by William Henry; Abraham Witmer, of that place, built the first large stone bridge in the United States in 1790, and it yet stands a monument of good masonry.

Railroad Farms.

Messrs. Editors—Returning recently from Washington to Baltimore, I took my seat in the last car. It was a warm afternoon, and there were five cars between the one I was in and the tender. In a half hour after starting the dust began to fill the car, and it finally became so thick that it was with difficulty I could recognize passengers across it; it became so oppressive that I was obliged to leave, and go forward into the next car; in it the dust was not so thick, in the one before it there was still less, and in the car second from the tender there was not enough to make it unpleasant. But in getting rid of the dust I was obliged to increase the risk of damage, in case of accident, by getting nearer to the locomotive. This state of things led me to reflect over the matter for a remedy; and I wish to propose to the railroad companies through the country the following plan:—

I believe the width of the roadway belonging to railroad companies generally is sixty feet, consequently, every 726 feet in length of road gives an acre of ground, less the width of the rails, which is immaterial; or we will say that every mile of roadway contains, say seven acres of land; or, in other words, the 25,000 miles of railroad in the United States contain within their roadway 175,000 acres of land, making 3,571 farms of 49 acres each. Now suppose our railroad companies should put up houses at every 7 miles along the line of the road, and employ a farmer for each, whose duty it shall be to put this soil into proper order, and sow it down in timothy. The extremes of each farm would be but 3 1-2 miles from the dwelling, it being placed in the middle, so that it would not be too long a distance for him to walk to take care of it. When he was not employed in farming he could be employed in the duties of leveling, or repairing the roadway, or anything else the company might have for him to do. In many places railroads have a running stream along the roadway, and by managing this stream so as to afford irrigation to the whole roadway, a crop of at least 2 1-2 tuns of hay ought to be raised per acre. The sloping sides of embankments and cuts should be sown with orchard grass, which would not require mowing, and the tillable parts with timothy. Supposing that three-fourths of the roadway only should be tillable, and that it should yield two tuns of hay only per acre, we have as the product 262,500 tuns of hay, worth at least $10 per tun, or the handsome sum of $2,625,000 as the annual agricultural produce of the now useless, idle roadways. A competent person as a farmer could be employed at say, $300 per year, and the hay crop raised by him would bring $720; thus, besides the value of his services along the line of the road, the companies would receive a revenue of $420 for each farm, less the cost of seed and manure. The facilities of taking manure to the sterile portions of the road, and of transporting the hay to market would not be felt in the daily transactions of road transportation, as advantage could be taken of light trains to carry it. The most important advantage, however, is yet to be mentioned. The roadway being covered with grass, all except the rails, there would be no dust to suffocate passengers, the rails would wear longer, and also the wheels and axles, and last, but not least, persons would not be obliged, whilst traveling, to go from a comparatively safe to an unsafe position, in order to breathe.

Having thus sketched the outlines which I wish to bring, through the medium of your wide-spread journal, up to the view of railroad companies generally, let us see which Board of Directors shall be the first to act, if not for their own, at least for the good of the traveling public. James H. Stimpson.

Baltimore, May, 1857.

[The views of our correspondent deserve attention, not so much as they relate to the profits pointed out as derivable from the hay that may be raised on the farms, as the specific means described for preventing dust on railroads. We have heard of some railroads having been laid with sods to prevent dust, but have not been informed with what results. Persons appointed to take care of the farms could also act the part of guards, and would be very useful in many ways for the protection of the track from the intrusion of animals, &c. The presence of grass on the sloping sides would also do much to preserve the earth from being washed down by the action of rains—an evil very severely felt, especially in such loose alluvial soils as that referred to between Baltimore and Washington.

Post Office Remittances.

Messrs. Editors—I have long felt the want, common I presume to almost everybody, of some easy method of making remittances for newspapers in different parts of the country, and I think the want might very easily be supplied through the Post Office in this way: Let the Postmaster General issue to the various Postmasters check-books suitable for the purpose, and each Postmaster be authorized to draw upon any Postmaster in the United States for the purpose intended to be accomplished, making it payable to the publishers of the paper which is to be obtained. The amount which would thus be paid to any one Postmaster would be too small to merit any apprehension of loss from embezzlement, and besides, one office would always be a check upon the other.

Don't you think the plan a good one, and quite capable of being carried out? If so, I know of no paper so likely to cause attention to be directed to it as yours.

Jas. P. McKinney.

Austin, Texas, May, 1857.

[The plan which our correspondent suggests for remitting drafts for small sums through the Post Office could be carried out without any difficulty, but it would require an amendment of our Post Office law for the purpose. The Money Order system, which is carried out so efficiently in Great Britain, and with such manifest advantages to all classes, besides yielding to the Post Office department an immense income, has been frequently brought under the notice of our Government. Whenever our people squeeze up their Representatives in Congress to make a law for carrying out such a useful reform in our Post Office system, it will be done. This affords us a favorable opportunity of recommending the attention of our correspondent and all concerned to the articles on this subject, pages 229 and 234 of this volume.

Maple Sugar Regions.

Messrs. Editors—I observed a paragraph in the Scientific American of May 23d, on the subject of maple sugar, in which you allude to having received a keg of superior quality from John Oliphant, Esq., of Cumberland co., Md., and remark that you were not aware it could be produced "so far south." I have seen the article (of good quality) manufactured in Alabama; it is quite common in the Southern States for the negroes to make it for their own use. I am satisfied it can be made in any State in the Union where the maple grows, the only difference being in the season or time when the sap begins to flow, which is during the months of January and February in the Southern States, and as early as December. Cold cloudy weather checks the flow, and if the temperature falls to 32° it ceases entirely, but resumes it as soon as the weather is warm enough to thaw. The season of white frosts and warm, clear sunshine is the proper time for making maple sugar. The sap will flow until the leaves begin to put out; but the syrup will not crystalize from sap procured late in the season, although it will make good molasses. I have assisted when a boy in the sugar camp, and know from experience what I have stated to be correct. A. F. Ward.

Violins.

Messrs. Editors—Why is it that violins cannot be made now that will sound as well as the Cremonians? Was there any secret art used in their construction which is not known now? Would not a violin made of the same kind of timber as the Cremona, and all its parts constructed exactly similar (which, I suppose, could be done by a skillful workman) not sound like the Cremona?

Avon, N. Y., May, 1857. S. W.

[We cannot answer a single question of our correspondent. We have heard the same statements from others respecting the superiority of the Cremona violins, and the opinion is common that no such instruments can now be made. This, however, may be wrong. Perhaps there are better violins made at the present day than were ever made at Cremona, in Italy, in the last century, from which circumstance they have derived their name. Some of our correspondents may be able to give us positive information on this musical subject.

A Great Discovery—The Philosopher's Stone.

Those which men in the "olden time" considered to be beautiful dreams have become realities in our day. Diamonds have been imitated, but with less perfection than pearls, therefore the natural ones are still without rivals. The German chemist Woehler, of Gottingen, however, has succeeded in giving to the world a gem which compares most favorably with the natural diamond. This is —"Bor," the elementary substance of boric acid. Heretofore no chemical means had been found capable of reducing it to its natural state. This new substance—Bor—is equal to the diamond in resisting chemical agents, and is even harder. Mr. Woehler anticipates that means will yet be found to make it colorless, its prevailing tints being reddish and yellow. In connection with M. Deville, Woehler made the discovery of reducing aluminum from its oxyd to a metal; this new discovery in reducing boric acid and extracting Bor, increases his celebrity.

L. R. Breisach.

Triplicity of the Year 1857.

The following are some curiosities of the figure 3, in relation to the figures of the present year:—

First, add all the figures and divide the sum obtained by the last in the year—$1+8+5+7=21\div7=3$. Second, add the second and fourth figures, and divide the sum by the third—$8+7=15\div5=3$. Third, add the second and fourth, then subtract therefrom the sums of the first and third, $(8+7)-(1+5)$, and the quotient will be 9—the second power of 3. Fourth, multiply the first and second figures, 1×8, and subtract this sum from $5\times7=35$—the quotient is 27, the third power of 3.

For duplicity we must look forward to the year 1861, which by the mere addition of all its figures, gives the fourth power of 2 (16).

L. R. Breisach.

Volcanoes.

Volcanoes sometimes transact business on quite a large scale. Mount Etna, we think it was, at one eruption vomited lava to an amount fifteen times greater than the whole mountain. The discovery of volcanoes in the central portion of China goes far to disprove that a communication with the sea is essential to their formation.

Chair for the President.

The San Francisco *Herald* notices the arrival in that city of Seth Kinman, a hunter, from the northern part of Humboldt county, *en route* to Washington, with a great curiosity in the shape of a chair made entirely of elk antlers, and designed as a present to Mr. Buchanan. The chair is very ingeniously and handsomely put together.

The New York Free Exhibition.

We have tried several times to visit the "Hall of Patents" in this city, alluded to some time ago as an experimental concern, intending to exhibit inventions at an annual rent for the space occupied, but can never find it open. It was to have been opened on the 4th of May. What is the matter?

Experiments have proved the interesting fact that fine silver exposed to the air in a state of fusion absorbs oxygen gas, and gives it out again in the act of consolidation. The quantity of oxygen thus absorbed may amount to twenty-two times the volume of the silver.

The Elizabethtown (N. J.) *Tribune* states that a pearl has been found by W. Cree, of that place, which is as large as a walnut, and of an oval form. It is perfectly white, and the largest Jersey pearl yet discovered.

New Inventions.

Flue and Tubular Marine Boilers.

A correspondent of the *Franklin Journal* gives the results of the use of the above named different boilers in the U. S. steamer Susquehanna. Taking the estimate of a period extending a few hours over 337 days with the old rising flue boilers, the Susquehanna averaged a speed of 7·25 knots an hour, and consumed 3,362 lbs. of coal hourly. With the new boilers (Martin's patent) in use for 44 days, the vessel averaged 8·3 knots per hour, and consumed only 2,752 lbs. of coal. The gain by the new boilers, he states, has been 45 per cent.

A California Circular Saw.

A friend writing to us from Oroville, Cal., states that a mill in that place has a circular saw driven by steam power that cuts daily, in ten hours, from 13,000 to 16,000 feet of 1-inch boards. The mechanic who constructed the mill will undertake to cut 30,000 feet of 1-4 inch boards with it every twenty-four hours for a whole week. The timber is what is called sugar pine, which is similar to our white pine. The saw mill belongs to A. S. Hart & Bro., and contains planing and tongueing and grooving machines. California is certainly a fast country, not even excepting *saws*.

The Martien or Bessemer Process Applied to Copper.

William Keates, of Liverpool, has patented an invention, the object of which is to desulphurise copper by blowing a hot or cold blast through or upon the molten metal. The regulus being introduced into the furnace by any of the usual modes, the apertures are closed, and it is subjected to the action of the fire until near fusing point. The blast is then turned on, and the heat increased to effect perfect fusion of the regulus whilst subject to the blast. This process is continued (occasionally removing the slag) until the copper becomes entirely metallic, when it is lapped out into molds. By preference, he laps out when the contents are only partially desulphurized, and again submits it to this or the ordinary refining process.

Improved Mowing and Reaping Machine.

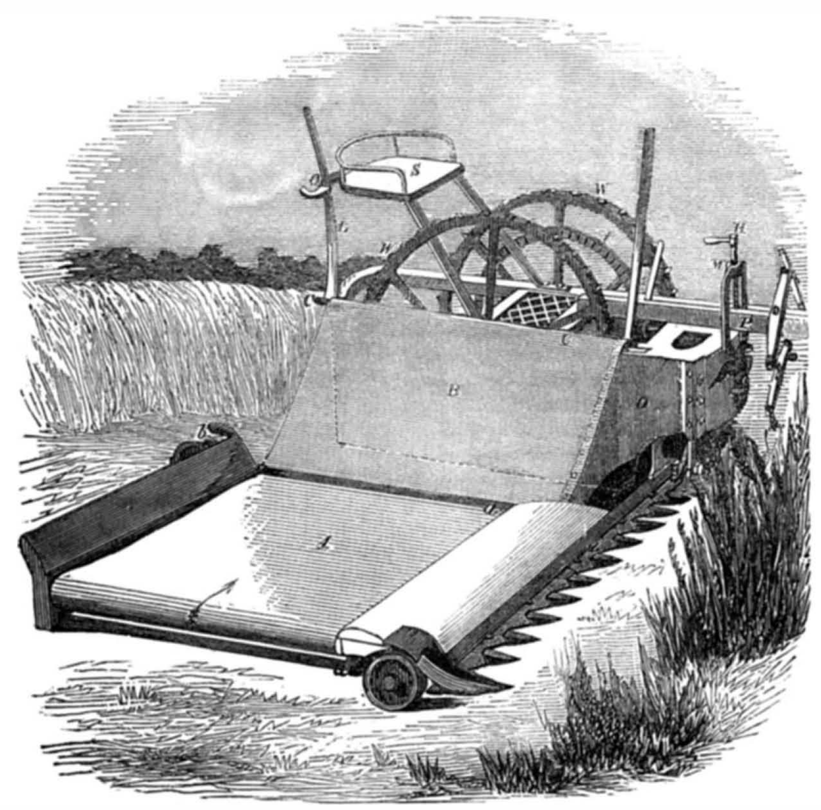
The accompanying figure is a perspective view of the combined mowing and reaping machine for which two patents for improvements have been granted to David Watson, of Newark, N. J.,—one issued on the 13th of last January, and the other subsequently—on the 3d of March.

The improvement in the first patent embraces the use of an adjustable curved plate spring applied to the upper surface of the finger bar when attached to the stirrup that is secured to the main frame. The finger bar rises and falls to accommodate the cutters to inequalities of the ground; the curved spring prevents the cutter bar from rising casually. The second patent, which is fully illustrated in the figure, embraces an endless revolving apron, on which the cut grain falls, and is carried in the direction of the arrow to an inclined tilting gate, where it is gathered until a full gavel or sheaf has accumulated, when it is tilted gently on the ground, ready for binding.

A is an endless apron or platform revolving around a long narrow roller, *a a*, at each side. A bevel pinion, *b*, on the back wheel of the apron frame gears into another bevel pinion on the end of the inside roller, *a*, moving the platform, A, towards the inclined gate or sheaf board, B. This latter is secured at the top to a vibrating bar, C, but is free and unattached at the bottom. At its sides it is secured to leather or flexible flaps, D, connected to the main frame. The bar, C, is attached to a lever, L, which is represented as held in its catch, *c*, at the right hand of S, the driver's seat. W W are the two traction wheels; Z are the cutters. The cutter bar has a crank end, which receives motion in the usual manner, through a rod and bevel gearing connected with the main axle. The pole, P, to which the whiffletrees are attached, is held in place by a screw bolt working in an arched socket, which forms a nut to the bolt. The screw of the pole is operated by the handle, R, which can release the pole, and allow it to be taken out in a second, and it is as convenient for securing it in place. Other parts of the machine are similar to those in common use.

Operation.—If we suppose the machine to be now drawn along, and a full sheaf or gavel of cut grain to be accumulated against, and on, the gate, B, by the revolving platform, A, the driver then detaches the spring lever, L, from its catch, and throws it outward at the top, when its lower end falls back to the

WATSON'S REAPING AND MOWING MACHINE.

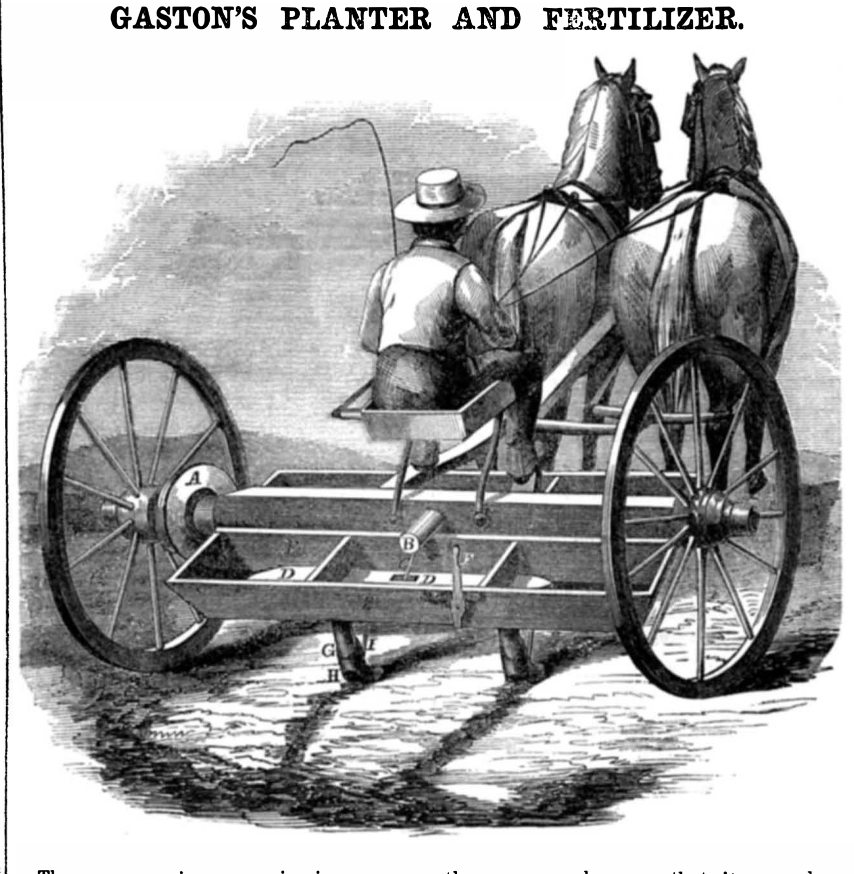


position shown by the dotted lines, leaving an open space between it and the revolving platform, and the gavel of grain then drops gently down on the ground. The lever, L, is then brought back into its catch, *c*, and the gate is set to receive another gavel, and so on continually. In cutting grass, the sheaf or gavel gate is not required to be used; the revolving platform lays the cut grass in rows on the ground.

Very complicated devices have been and are now employed on some reaping machines for raking and delivering cut grain in gavels. The revolving platform, A, and the tilting gate, B, in this machine, appear to be the most simple devices we have seen for accomplishing these objects, and they appear to be as efficient as they are simple.

More information may be obtained by letter addressed to Mr. Watson, as above.

GASTON'S PLANTER AND FERTILIZER.



The accompanying engraving is a perspective view of a machine patented February 3d, of the present year, by Mr. J. C. Gaston, of Oxford, Ohio.

The machine is designed to sow in drills by the aid of one or more animals, and to accompany the seed, if desired, by a quantity of compost, guano, plaster, or any similar fine fertilizer. The novel feature of the invention lies chiefly in the arrangement of reciprocating feed bars for the purpose of regulating the quantity of grain or compost supplied to the escape valves, so that it may always be the same, and in arranging on the under side of such feed bars, cut-offs or agitators to regulate the discharge of grain or fertilizer being sown, or permit a continuous supply to pass through the apertures if desired.

The reciprocating motion is obtained from the rotation of one of the wheels by means of an obliquely mounted disk or cam, A, fixed on the hub. The periphery of this disk runs in a notch, or between suitable pins or rollers, on a horizontal bar, not visible, which plays transversely across the carriage parallel to and under the axle, and by connecting to an arm, not visible, on the rock shaft, B, imparts thereto a suitable semi-rotatory or rocking motion. This by means of arms, C, gives a regular reciprocating motion to bars, D, which latter are mounted and guided in the boxes or hoppers, E. It must be premised that there are two of these hoppers, E, one forward and the other behind the axle, each fitted with a reciprocating bar. There are two or more holes in the bottom of each of these hoppers according to the number of drills or rows to be planted at one operation, or if it is desired to distribute the seed broadcast, a large number of such holes, each of small size is provided. The seed being placed in one hopper, and the fertilizing material (if any is employed) in the other, both tend to flow through their respective holes, either to be scattered on the surface or to be led through the tubes, G, into the scores or furrows excavated by the shoe, H, which is maintained in position by the rod or spring, I.

The bars, D, do not lie upon and over the holes, but are supported upon metallic feet of greater or less breadth, which are projected from their under surfaces. These feet serve as agitators to keep the loose material in active motion so as to ensure a flow through the holes whenever such holes are open, but if it is not desired to make the flow continuous they are constructed of such area on their lower faces as entirely to cover the holes and prevent the flow during some portions of each motion.

Below the bottom of the hoppers, E, are valves or slides, not actively reciprocating, but capable of being set more or less open by means of the hand lever, F. The latter may be almost closed in sowing small seeds, or may be set wide open for sowing larger ones, and by providing separate means of moving each slide the quantity of fertilizer may be uniform whatever the variations in the quantity of seed, or the flow through either or both may be increased or diminished in various parts of the field, according to the strength of the land or the fancy of the operator. These valves also afford very convenient means for shutting off the flow altogether in traversing the highway, or the like.

For further information the inventor may be addressed as above.

The Flickering of Gas Light.

One of the most useful inventions positively wanted by the gas light using community, is some method of positively preventing the gas jets from flickering. Gas regulators have been invented to graduate the quantity passing through the tubes under varying pressures of the gas, but none that we have seen provides for a steady flow to the burners. Those who read and write much by gas light soon injure their eyes. Many persons have spoken to us on this subject, and their testimony is uniform in reference to the evil effects of flickering gas lights. The vibrations of the gas light produce similar vibrations in the retina of the eye, and thereby unduly excite it. According to the computations of Dr. Young, there are as many as 535,000,000 of undulations in yellow light—the ray which prevails in gas jets—produced in a single second. It is very evident, therefore, that the disturbed vibrations by flickering gas lights must effect the eye injuriously. It has been found that a person can study and write a great deal longer, and with greater ease, by the light of a sperm candle or an oil lamp than with gas; but this would not be the case were gas lights remedied of the evil of flickering. Here is a field for invention. We are positive that a remedy can be provided for this evil, and it will be one of no small importance and benefit.

The Emperor of Austria has conferred on Mr. Paul Pretsh, the inventor of photo-galvanography, the grand gold medal for arts and sciences.

A correspondent of the London *Family Herald* states, that when glycerine is applied to boils in an incipient stage, it soon brings them to a favorable condition, and heals them.

Scientific American.

NEW YORK, MAY 30, 1857.

The Conservation of Force.

This is the title of a paper read in the month of February last, by the world-renowned Professor Michael Faraday, before the Royal Institution, and recently published from a corrected copy by himself. It has created considerable sensation among British philosophers, and has not only been made the subject of editorial criticism by every English periodical devoted to science, but numerous correspondents—some under their own and others under fictitious signatures—have through these periodicals been wrangling and jangling over the subject ever since. The meaning of the term "conservation of force" is simply the indestructibility of force. In other words, there is a certain quantity of force in the universe which can no more be destroyed nor increased than matter itself. With this idea of force in the universe, the common idea of gravity, according to Professor Faraday, is at variance. The received idea of gravity is, that an attractive force is exerted between any two or all the masses of matter, at every sensible distance, but with a strength varying inversely as the square of the distance. He points out where apparently this contradiction lies in the following very clear and specific manner:—

"Assume two particles of matter A and B in free space, and a force in each or in both by which they gravitate towards each other, the force being unalterable for an unchanging distance, but varying inversely as the square of the distance when the latter varies Then, at the distance of 10 the force may be estimated as 1; whilst at the distance of 1, that is, one-tenth of the former, the force will be 100; and if we suppose an elastic spring to be introduced between the two as a measure of the attractive force, the power compressing it will be a hundred times as much in the latter case as in the former. But from whence can this enormous increase of the power come? If we say that it is the character of the force, and content ourselves with that as a sufficient answer, then it appears to me we admit a *creation* of power, and that to an enormous amount; yet by a change of condition so small and simple as to fail in leading the least instructed mind to think that it can be a sufficient cause:—we should admit a result which would equal the highest act our minds can appreciate of the working of infinite power upon matter; we should let loose the highest law in physical science which our faculties permit us to perceive, namely, the *conservation of force*. Suppose the two particles A and B removed back to the greater distance of 10, then the force of attraction would be only a hundredth part of that they previously possessed; this, according to the statement that the force varies inversely as the square of the distance would double the strangeness of the above results; it would be an *annihilation* of force; an effect equal in its infinity and its consequences with *creation*, and only within the power of Him who has created."

This extract clearly shows the difficulty under which Professor Faraday labors in reconciling the common idea of gravity with the "conservation of force." Is the doctrine of "conservation of force" true in mechanical philosophy? This is not denied; it is admitted. Is the doctrine of gravitation, as expressed, true also? It is. But both cannot be true and contradictory. How, then, has the idea of a contradiction between these arisen in Professor Faraday's mind? To us it appears that he has simply been confounding a cause with an effect. He has supposed an impossible case to explain his views of the contradiction referred to, and this never should be done in discussing a scientific question. All we know about gravity is simply the operation of matter. When we see a body of water falling down a precipice, we say it falls by gravity, but we do not know what gravity is. We know it is a force, but we do not know what force is. At the same time, when we say "this body of water falls by gravity," we know that the power of the water is as the hight of the fall, and that it moves faster and faster every second—so that of a fall, like Niagara, of 144 feet, the water would leap from the top to the bottom in three seconds—whereas, if it were only 64 feet, (not the half,) it would take two seconds to descend to the bottom; and if it were 257 feet, it would leap that distance in four seconds—that is, 113 feet the fourth second. These are the varying velocities of falling bodies; but, then, there is no contradiction between this method of their operation (gravitation) and the "conservation of force." To account for the cause of this operation of moving bodies is an entirely different question, and here is the point where, in our opinion, Professor Faraday mingles an effect with a cause, and hence the apparent contradiction between the two doctrines mentioned as belonging to mechanical philosophy.

There is no creation of force by a body of water falling down a precipice in the manner described, with varying velocities, nor would there be an annihilation of force if the same body of water were lifted back from the pool to the top of the fall. It would just require as much force to lift it up as it exerted in falling, and it would produce the same effect over again. The weight employed to give motion to clockwork, by falling, is a familiar example of this kind. There is no force lost, and none gained, by the raising and falling of the weight.

In the London *Mechanics' Magazine*, sneers and ridicule have been directed against the Professor for discussing such a subject. It is said "he is no mathematician, and he cannot discuss it." But ridicule is not argument, and mathematicians are not immaculate. The most eminent mathematicians of Europe disputed for thirty years over the question "how to measure force," without agreeing, and, at last, "sheathed their swords for lack of argument." The mathematicians of England appear to have got into a like snarl with Professor Faraday's paper.

Madame Rumor on Duty—The Rumored Changes in the Patent Office.

The *Daily Times* of Monday the 18th, contained a telegraphic announcement that Dr. Gale had resigned as examiner in the Patent Office, and that four other examiners were to be removed for political cause. This was followed the next day by the fuller statement through the same channel, that "Dr. Gale, who yesterday resigned his office as examiner in the Patent Office, has held the office for some years with reputation. It was alleged against him that he was in some way concerned in the establishment of a school here for the education of female colored teachers. He was, I believe, appointed a Director of this intended institution, which ex-Mayor Lenox recently demolished. He tendered his resignation when he found that he would be removed. Mr. Moss, another examiner, who resigned yesterday, was to have been removed. Three others are to be removed from the Patent Office on account of alleged political reasons. One of them was complained of by the Vice President, who demanded his removal. Judge Mason, the Commissioner of Patents, is said to be indignant at this interference with his assistants, without consulting him. But whether he has remonstrated against it I have not heard."

At the time of our going to press Dr. Gale has not resigned, nor does he intend to, but report says that he and also Messrs. Lane and Schaeffer will be removed, which is doubtful. There are no indications that Judge Mason is indignant or objectionably interfered with. He is actively engaged at his post, and all business goes on precisely as usual throughout the office.

Mr. Moss, late assistant examiner in the civil engineering and mill-work department, has resigned, but for no political reasons as far as we can learn.

Dr. Breed, late assistant, and acting chief examiner in the chemical department, has resigned, and established a laboratory at Washington, where he proposes to devote himself to the procuring of chemical patents, new processes, etc. Dr. Breed studied in Germany, under the famous Liebig, and is an experienced chemist. The series of articles lately published in our paper, presenting the features of all the chemical patents granted for two or three years past, were from Dr. B.'s pen. His resignation will be a loss to the Patent Office.

Tapioca.

Many persons are familiar with this as an article of diet, who do not know how it is obtained, or really what it is. It is the product of the Cassava root. There are two varieties of the cassava plant, both natives of South America; the one is the bitter and the other is the sweet cassava, but both are used for food. The first in its natural state is highly poisonous, and the Indians use its juice for poisoning their arrows. It is from this cassava that *tapioca* is made, but with all the poison removed. The poisonous principle has been found to be very volatile, hence by submitting the roots to the action of heat, it is all driven off; it is only when eaten raw that it is highly dangerous. The roots are first washed, then reduced to pulp, and the juice allowed to drain out. The pulp is then heated in a pan until it becomes slightly roasted; when in this state it forms cassava bread, the principal food of the natives. The juice which has been allowed to filter from the pulp is of a milky color, and is allowed to settle for some time in wooden dishes. A deposit of starch then falls to the bottom; the poisonous juice is now run off, the starch washed, and all the moisture driven off by putting it on hot plates until it is dry. It is afterwards granulated in sieves, and in that state forms the *tapioca* of which very excellent puddings are made. The heating of this starch on the hot plates drives off all the poison.

Recent experiments have been made in France by distilling the cassava root and condensing the vapors, for the purpose of ascertaining the nature of its poisonous properties. A very small quantity of prussic acid was thus obtained, about 0·004 per cent of the vapor, but the roots employed in the experiments were not fresh, hence it is reasonable to suppose that they contain more of this volatile poison when fresh dug from the ground, as cows have instantly dropped down dead from eating them. No other poisonous substance was found. Cassava contains a great amount of starch, no less than 23 per cent, and 5 per cent of sugary matter.

Pure Air and Sleep.

Dr. Arnott, in his Physics, states that a canary bird suspended near the top of a curtained bedstead where persons are sleeping, will generally be found dead in the morning from the effects of carbonic acid gas, generated in respiration. He set forth this as a fact, to show the necessity of breathing pure air in sleeping apartments, and a sweeping argument against the old fashioned high-curtained bedsteads. A healthy man respires about twenty times in a minute, and inhales in that period about seven hundred cubic inches of air; this he exhales again in the form of carbonic acid gas and water, which vitiates the atmosphere. Three and one-half per cent of carbonic acid gas in the air renders it unfit for the support of life; this shows how necessary it is to provide a supply of pure air for the support of respiration.

There are also certain facts which go to prove that more danger exists—that there is a greater proneness to disease—during sleep than in the waking state. In Turkey and Hindostan, if a person falls asleep in the neighborhood of a poppy field, over which the wind is blowing towards him, he is liable to "sleep the sleep which knows no waking." The peasants of Italy who fall asleep in the neighborhood of the Pontine marshes are invariably smitten with fever. Even travelers who pass the night in the Compagna du Roma inevitably become more or less affected with the noxious air, while those who pass through without stopping escape the marsh fever. Those who have traveled in tropical climes, and who have been attacked with bilious fevers, uniformly ascribe the cause of their sufferings to night exposure in the open air.

An English traveler in Abyssynia has asserted that he could live in health in that sickly climate, by a proper selection of the situation where he slept every night. There is abundant evidence, it would appear, which goes to prove that by proper attention to the place where, and the circumstances under which persons sleep, many diseases may be avoided.

Expansion of Cast Iron.

In a letter from P. D. Beckwith, of Dowagiac, Mich., a practical iron moulder, he states that "iron castings invariably shrink and become smaller in solidifying." In another letter received from W. B. Seward, of Bloomington, Ind., he says "cast iron shrinks about one-eighth of an inch to the foot in becoming solid." He has had many years' experience in the foundry business. Allowance is made in making patterns for this amount of shrinkage. Both of these letters refer to the statement on page 285 regarding the adaptability of iron for receiving exact impressions of the mold. Mr. Seward states that iron does take the impression of the mold with great exactness. On page 33, in the last edition of Graham's *Elements of Chemistry*, volume 2, there occurs this expression, "cast iron expands in becoming solid." Our practical correspondents are no doubt correct in this matter.

English India Rubber Goods.

We have received from Mr. H. H. Day a copy of the decision of Judge Grier, of Philadelphia, in the case of an application for an injunction by the Congress Rubber Company, to restrain the sale of india rubber goods of English manufacture, alluded to in the SCIENTIFIC AMERICAN of the 16th inst. In this decision the defendants are enjoined from making, selling, using or causing others to use india rubber shirred goods of English manufacture as a violation of Goodyear's patent. In Great Britain the sale of American vulcanized india rubber goods has been prohibited as an infringement of Hancock's patent; and it is perfectly just and right that the sale of English india rubber goods should not be allowed here, Goodyear being the original inventor. There is a defective term in the decision—it is the word "English" manufacture, which should have been "British" manufacture.

Anti-Divining Rod.

Several letters have been given in our columns from correspondents who believe in the efficacy of the divining rod, asserting that in the hands of certain persons it never fails to indicate the presence of water under the surface of the ground. We have received a letter from L. P. Summers, of Cobalt, Conn., in which he states that he has seen the divining rod used by a person who believed in its efficacy, and who had confidence that in his hands it really would divine where water was, but which utterly failed to do so. He asserts that the motions of the rod are produced by the strain upon the muscles of the arms, owing to the manner in which it is held. To prove that he is right he says:—"Let any person procure a divining rod which has grown in the form in which it has to be held when used, so that there will be no strain upon it, and consequently no tendency to spring back, and he will find that it will not work, thus proving that the strain of the muscles upon the common divining rod is the cause of its movements."

Shipbuilding.

The total number of vessels built in the United States during the past year was 1,703, the total tunnage of which was 469,393. Maine, Massachusetts, and New York are by far the greatest shipbuilding States, more especially the first, no less than 316 of the vessels, amounting to 149,907 tuns burden, having been constructed in Maine ports.

Sugar and Molasses.

No less than $22,400.353 were expended for imported brown sugars last year, and $4,334,-668 for molasses. This, however, is only equal to about one dollar for each inhabitant.

A little dilute liquid ammonia poured upon a hot iron plate in a greenhouse has a wonderful effect in developing flowers and leaves.

Gas from Wood.

Most of our readers are well aware that illuminating gas can be made from wood, by the use of retorts differing somewhat from those for coal, and that in several localities—the city of Philadelphia for one—such retorts have been used, under a patent, for a considerable period, actually manufacturing gas for use. One objection which has been urged against the use of wood gas is the separation of its constituents by their different specific gravities. On this and other points relating to this great experiment, the following extract from the Engineer's report for 1856 will be found of value:—

"Another year's trial of the cellular retort, for the production of gas from vegetable substances, has confirmed the results heretofore reported with respect to the quantity and illuminating quality of the gas thus obtained. As there seemed to be some doubt as to the permanency of this gas, it was thought worth while to test it in such way as would bring the question to a satisfactory solution. A considerable quantity of it (30,000 cubic feet) was stored in a gas holder by itself, and after remaining thus isolated several weeks was tested photometrically. It had not changed perceptibly, having retained its illuminating power as completely as coal gas under similar trial. With the present relative prices of wood and coal in the Philadelphia market, the cost of making gas from the former is somewhat the least, but the difference is not sufficient to justify the immediate abandonment of the latter. Should a commercial change occur, by which the price of coal should be again advanced to the high point reached two or three years ago, there might arise important advantages to these works and its customers from the ability to make the substitution of wood for coal. It will therefore be consistent with good policy to continue, as heretofore, the use of such number of wood retorts as can be supplied with that material without sensibly affecting its market price, particularly as their use is accompanied by some immediate profit and entails no extra cost for the contingent advantages it presents."

A very careful and accurate analysis and photometric examination of gas from pine and also from second growth oak, lately made by Professor W. Gibbs, of New York, and Dr. F. A. Genth, of Philadelphia, indicated the specific gravity of pine gas to be 0·663, and of oak gas to be 0·580. The specific gravity of gas from coal, according to Dr. Ure, ranges between 0 508 and 0·659, and that from oil between 0.818 and 1.175, the illuminating power being somewhat proportional to the density. The analysis by Messrs. Gibbs and Genth, is presented in a tabular form in the report of the Engineer, and gives results as follows:—

Of free hydrogen (a gas highly combustible and of great value for heating purposes, but yielding little light) pine gas contained 33 per cent, and oak gas 30 per cent. According to the experiments of Henry, an English chemist, who published a careful analysis of gas from the Wigan cannel coal, the quantity of free hydrogen in coal gas varies from 0 to as high as 60 per cent, depending on the length of time it is exposed to heat. As one of the principal features in the wood gas retorts, (Pettenkoffer's patent,) employed at Philadelphia, consists in circulating the gas for a considerable time through red-hot flues to complete the permanent union of its elements, the result deprecated by Henry, decomposition into its ultimate elements may take place to some extent.

Of light carburetted hydrogen, (a valuable illuminating constituent,) the pine gas contained 21 per cent, and oak gas 33. According to Henry, the quantity of this constituent in coal gas varies from 20 to 83 per cent, being least in that longest heated.

Of olefiant gas (the most valuable constituent in any illuminating gas,) pine gas contained 11 per cent, and oak gas 6 per cent. In the coal gas experiments referred to, this varied from 0 to 13 per cent, being least in that longest heated.

Of carbonic oxyd, (a kind of half-burned gas of little or no value as an illuminator, and quite poisonous if it is taken into the lungs,) pine gas contained 27 and oak gas 26 per cent. Henry's analysis showed coal gas to contain from 0 to 12 per cent, increasing with the time it was exposed to heat.

Of carbonic acid, (familiar to everybody,) pine gas contained 5 per cent, and oak gas none, while oxygen and nitrogen were present in too small quantities to be worth noticing. Henry makes coal gas contain none of the three last named.

The Engineer remarks that these gases were collected at the Ninth Ward works, and taken to New York for analysis, and that the results furnish a highly satisfactory explanation of certain curious phenomena which accompany the combustion of this gas.

The illuminating power as tested by these chemists was found to be over 26 candles for a five feet burner, but a subsequent series of photometric trials of wood gas, previously passed through a long pipe cooled to 15° Fah., gave an average of 18.3 candles from a burner consuming 4·3 feet per hour.

The conclusion at which these gentlemen arrive from their elaborate examination is, "that wood gas, in illuminating power, is fully equal to the average of coal gas." Our readers versed in the subject will be able to deduce their own conclusions from the figures given by these chemists, but we do not find them as favorable for the extension of wood gas as we had hoped. The subject is one of great importance, as there are many cities and factories where wood is far cheaper and bituminous coal much dearer than in Philadelphia. It is quite possible that a greater attempt has been made to give a good character to wood gas than to throw light upon the question of economy as to coal or wood being the cheapest gas producing agents. There is such a difference in the quality of coals for making gas. that some kinds yield as much as one-third more gas to the tun than others, and yet the expense of making the gas is greater for the poor than the rich coal. Perhaps the Philadelphia gas works may be endeavoring to economise in the use of inferior coal, an extreme to which our gas makers are very liable.

Mechanics' Institutes.

Such institutions have done, and are now doing, much good in all the cities where they have been established and managed with spirit and discretion. Quite a number of these institutions are now in successful operation in the United States and England. In the latter country, at Blackburn, a famous manufacturing place, the members of the Mechanics' Institute lately gave a grand soiree, at which Sir Robert Peel presided, and made a speech, some parts of which are so good that we take pleasure in presenting them. He said:—

"This institution which we are now celebrating is called a scientific institution. It has what is called an engineering class—a noble effort those men are making in the right direction. The plan they adopt is the way in which they may be confident that they will succeed in their exertions. We are told that it is from mechanical skill and scientific invention that the great progress of our country has resulted. Let me observe that the present age in which we live is eminently practical. We have now done away with all the fine theories of the school of Voltaire and Diderot. Science is everywhere. When we want to travel rapidly by locomotion, it is the steam that carries us; when we want to send our communications of thought, it is the electric telegraph that gives wings to our ideas. Then recollect that this study of the sciences is only in its infancy. All these great advantages which we are reaping are matters which have only just been developed to the world. How ought we to exclaim when we see these benefits thrown upon us? We may justly exclaim 'O God! how glorious are thy works, thy thoughts are very deep. An unwise man doth not well consider this, and a fool doth not understand it.' (Applause.) Let us hope that this generation may know, as far as lies in their power, to understand and profit by these advantages, and we shall not fail to reap the manifold benefits of our knowledge.—Science is present with us in every branch of industry."

Stellar Distances.

For a long period astronomers unsuccessfully endeavored to determine the distance between the stars and the earth, and it is only within a comparatively short time that the interesting problem can be said to have been solved. The distance which separates us from the nearest stars is, according to M. Arago, about 206,000 times the distance of the sun from the earth—more than 206,000 times 95,000,000 of miles. Alpha, in the constellation of Centaur, is the star nearest to the earth; its light takes more than three years to reach us, so that, were the star annihilated, we should still see it for three years after its destruction. If the sun were transported to the place of this, the nearest star, the vast circular disk, which in the morning rises majestically above the horizon, and in the evening occupies a considerable time in descending entirely below the same line, would have dimensions almost imperceptible, even with the aid of the most powerful telescopes, and its brilliancy would range among the stars of the third magnitude only.

Fundamental Forms of Crystals.

The forms of crystalized minerals are various, and to the eye there often seems to be no relation between different crystals of the mineral. All their shapes, however, are but modifications of a few fundamental forms. There is perhaps no mineral which presents a greater variety of form than calc spar. *Dog-tooth* spar is one of its forms, and *nail-head* spar is another. The one is a tapering pyramidal crystal well described by its name; the other is broad and thin, and shaped much like the head of a wrought nail. Yet both of these crystals, and many others, are derived from the same primary forms. Crystals may be readily chipped off from this mineral in three directions, and these are found to be identical in their angles. They consequently have the same nucleus or essential external appearance.

Iron Wire for Baling Cotton.

An Alabama correspondent of the *Charleston Courier* argues warmly in favor of this mode of baling cotton. The principal advantage is that wire will not burn like rope. Cotton bound with wire can scarcely be made to blaze; and if a bale takes fire, combustion is to be carried on at all, must be in a smouldering condition. The wire holds the cotton more firmly than rope, in a compact mass, so that air can scarcely reach the parts on fire. The danger from the devouring element being less, the insurance in store or on shipboard ought to be reduced. Wire also is cheaper and lighter than rope, and could afterwards be used in baling up goods, or for other purposes. It should be malleable and galvanized, to prevent the possibility of its rusting. Like rope, it can be adjusted to any sized bale, both in packing and compressing.

Bones as a Manure.

A late number of the *Country Gentleman* has an elaborate article by Levi Bartlett, of New Hampshire, on bone manure. He concludes that there is no other manure whose effects are so lasting as an application of ground bones. Besides the increase of crops he says it supplies phosphate, which the grasses generally lack, on old and long grazed fields in New England, and the want of which, cause what is called "bone disease" in cattle. Mr. W. recommends that the bones be pounded, and thus broken to pieces, boiled or ground, and then spread evenly over the soil, and mixed with it. He has a field that was thus dressed years ago, and the effect is yet very perceptible on clover.

Cure for Hydrophobia.

Receipt.—First dose, 1 oz. of elecampane root, boiled in 1 pint milk until reduced to a half pint. Second dose (to be taken two days after the first,) 1 1-2 oz. of elecampane root boiled in 1 pint of milk, boiled as the first. Third dose, the same as the second (to be taken two days after); in all three doses.

The above was sent to the New York *Tribune* by J. W. Woolston, of Philadelphia, as a cure for the above terrible disease, and he states that he has known it to be perfectly successful in effecting a cure in twenty cases.

Notes on Science and Foreign Inventions.

High Farming.—Mr. F. Mechi, whose name is associated with the first triumphs of American reaping machines in England, which occurred on his farm at Tiptree, has recently written a little work called "How to Farm Profitably," in which he disposes, in a good humored manner, of all those who have taken grounds against *high farming.* He says:—

"I have often been much amused by the compassionate look and manner in which my friends inquired after my doings at Tiptree. The translation of these sentiments is this: 'Mr. Mechi, you are kindly losing money by your experiments to oblige the country, and we ought to feel grateful to you.' But I sternly ejaculate that what does not pay in agriculture is not an improvement. The fact is, for several years I have been deriving a most gratifying return for my expenditure, and it is of a very enduring and continuous character, but the world does not believe it."

Agriculture Improving Climates.—The London *Engineer* says:—"Drainage and shelter are the principal works which have hitherto been instrumental in improving the climate of this country; and the change which has been effected by them in some districts is such, that vegetation is now further advanced in April than it formerly was on the 1st of May. In other words, the climate throughout the year is not only greatly improved, but vegetation in spring is from fourteen days to a month earlier, while results in harvest are still more favorable for the husbandman."

To Cure Egg-eating Hens.—The following method was once adopted with success by a correspondent of the London *Cottage Gardener*:—He took a partially-eaten egg from the nest, and substituted in place of the yolk mustard mixed with water of a similar consistence. He then replaced the egg in the nest, and supposes the bird did not approve of the flavor, as he has not lost an egg since.

Pearl Fishery in the Persian Gulf.—Since our recent notice of successful pearl hunting near Paterson, N. J., new discoveries of pearls have been made in other creeks. The fishing of such pearls is an easy task, in comparison with that of the Arabian pearl divers at Bahren, on the Persian Gulf. The creek pearl fisher performs no diving operations. Provided with a pair of long india rubber boots, a spade, and a knife, he hunts his pearl without danger of drowning or ducking. The Arabian pearl fisher, on the other hand, has to dive down into the deep sea in order to secure the much prized baubles. In a nude state, with his feet resting on a huge stone attached to a rope fastened to a boat, his nostrils compressed with wooden pincers, and a basket slung around his neck, he is rapidly lowered by his companions; his feet barely touch the bottom ere he is off the stone, which is rapidly hauled up, and another diver occupies it, while the one who first went down is fast filling his basket with pearl oysters. Up he comes, empties his basket, takes three or four deep inspirations, and down he goes again, continuing this for several hours daily. It is a fast life and a wet one. The poor Arab diver, racked with rheumatism, finds an early grave. The pearls of the Persian Gulf are the most beautiful in the world; and it is something remarkable, that springs of fresh water are generally found at the bottom of the sea, where the pearl oyster is obtained.

Prize for an Essay on Marine Engineering.—The Paris Academy of Sciences offers the extraordinary handsome prize of 6,000 francs for the best essay "On the application of Steam to the Navy." The essays must all be sent in prior to the 1st of November next. This prize ought to be sufficient to tempt the most able marine engineers to make an effort to gain it.

Gas Works.—From the yearly return of gas works in England, we learn that the average price per 1,000 cubic feet is 4*s.* 9*d.* sterling, or a little more than one dollar. The average amount of gas obtained for a tun of coal is 7,980 cubic feet. Every five cubic feet of gas consumed per hour gave a light equal to 9·62 sperm candles weighing six to the pound; in other words, 1,000 cubic feet of gas, at the low price stated, gives a light equal to 1,924 sperm candles

A. W. A.—Correspondents who expect answers to their letters must furnish us with their full address. We cannot undertake to preserve letters among our files without knowing the writer's name.

D. H., of Conn.—We perceive no novelty in your forceps whatever. Watchmakers and surgeons are all provided with such instruments, and the use of them to pull out corns is no more novel than it would be to use a lancet for cutting them instead of a knife. The combination of several instruments in one handle is not patentable.

R. P., of Conn.—As soon as your case is acted upon at the Patent Office we will advise you by mail. It is no reason because another party has received a Patent whose papers were filed since yours that you are being neglected at the Patent Office. It is probable the invention to which you allude came under another department in examination, who had not so many cases in hand as the examiner who has your matter in charge. In some of the examiner's rooms, the work is kept so closely up, that an applicant has to wait but a few days to have his case examined, while others are months behind.

M. B., of N. Y.—You are quite right regarding the practibility of collecting a small column of water from springs on a hill two hundred feet high, and employing it to drive a grist mill. In a factory at St. Blasier, in Baden, there is a turbine wheel only 14 1-4 inches in diameter, under a column of 354 feet high, conveyed in a pipe 16 inches diameter. It drives 8,000 spindles, roving frames, carding engines, &c. Under 100 feet head, a wheel discharging only one cubic foot per second is equal to 6 72-100 horse power; this allows for 25 per cent of loss by friction, &c. You cannot decompose water by an electric current, and use the gases profitably for generating motive power.

C. J. H., of N. Y.—We are not able to tell you what increase of power you may obtain in your engine by adopting the Wethered system of mixed common and superheated steam. A strong solution of isinglass is a good cement for leather belts; a better, is a cement composed of equal parts of india rubber and asphalt dissolved in turpentine.

S. F. M., of S. C.—If you were to isolate your house by glass from the earth, instead of preventing danger from disruptive discharges of lightning, you would increase the danger.

F. S., of Phila.—You should try an experiment in heating the leaches in your tannery with the exhaust steam of the engine. The expense would not be great. It is our opinion that the increased resistance to the exhaust will not counterbalance the saving of fuel you would effect.

A. R. D., of Mass.—Glycerine is sold at a high price by druggists in this city—why, we cannot tell—as it is not much used, and is generally suffered to go to waste in soap works. If it were sold cheap, great quantities of it would be used.

F. G. R., of Va.—Brass and copper are superior to iron in drills for sowing guano with the seed. These metals will not oxydize so rapidly with the ammonia of the guano as iron. An alloy of lead, tin and copper, we believe, would be excellent for the purpose. Charcoal dust mixed with the guano would scour the iron if it were used, and keep it free of rust.

N. A. M., of Ala.—A force pump is the best apparatus you can use for supplying your boiler with water from a pond or well sixty yards distant, and eighteen feet below the boiler. Employ a cast iron pipe for conveying the water.

J. M. & Co., of Ohio.—A hydraulic ram can be made of sufficient capacity to discharge the water flowing through a 12-inch pipe under a fall of eight feet. We do not know what would be its cost. We do not advise you to get such a ram. The water, with the fall you have, might be employed on a small turbine wheel to work a pump that would raise more than could be elevated by a ram.

J. G. E., of N. C.—A pressure of 4 1-11 pounds on each square inch, with a velocity of 24 feet per second, will certainly give over a horse power for every 10 square inches of water exit. This allows the deduction of one-third for loss. We have made the calculation in the same manner as for a steam engine—that is, multiplying the pressure upon the 10 inches, that into the speed per minute, and divided by 33,000.

H. W. & Co., of N. Y.—The mere purchase of a machine from a patentee does not necessarily include the right to use it at all. There must be an agreement in regard to the right to use. If you purchased machines without any specific understanding with the patentee in regard to the right, he could undoubtedly restrict you in their sale to the territory which you own.

D. A. B., of Ala.—As far as we are capable of judging from the sketch and description you send of your sewing machine, it contains no feature of patentability. The two-pointed shuttle for making a stitch by its movement in each direction, is included in the first patent of A. B. Wilson, granted, we believe, in 1850.

C. H. D., of N. Y.—The barrels of guns are browned by forming an oxyd on their surface with a weak acid. Take a little nitric acid, and dilute it with ten times its measure of water, rub the gun barrel over with this by a sponge, then set it aside for 24 hours to rust, now rub off the rust with a scratch brush, and put on the acid a second time, and set it past for 24 hours longer. After this, it is steeped for a short time in lime water, and then allowed to dry; the rust brushed off again, when the barrel is then oiled and dried. Nitrate of copper and muriate of iron, in equal quantities, are sometimes employed in place of the dilute nitric acid.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, May 23, 1857:—

J. W. C., of Ky., $12; N. T., of Me., $25; J. L. S., of N. C., $26; J. B., of Texas, $30; P. N. W., of Ohio, $30; R. H. T., of N. Y., $135; E. A. S., of Pa., $81; A. Van D. of N.Y., $30; J. J. O., of Miss., $25; D. W. H., of Mo., $30; W. H. G., of N. H., $30; L. S. C., of N. Y., $30; I. H. W., of N. Y., $100; A. T., of Mich, $25; J. M., of Ind., $250: E. T. M., of Mass., $25; J. N. C., of O., $100; J. W., of O., $30; J. A. D., of N. Y., $25; R. G. Jr., of Mass., $30; T. E. S., of Pa., $30; C. H. T., of L. I., $25; D. C., of Pa., $25; J. P. C., of N. Y., $30; J. F. H., of N. Y., $10; S. G., of N. Y., $50; S. G. McM., of Ill., $55; J. C. T., of Ill., $30; S. A. B., of L. I., $25; C. B. S., of Mass., $27; S. I., of L. I., $25; I. H. P., of N. J., $25; F. S., of N. Y., $55.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, May 23, 1857:

J. W. C, of Ky.,; N. T., of Me.; J. B., of Texas; S. A B., of L. I.; E. A. S., of Pa., (3 cases); A. T., of Mich.; J. L. S., of N. C.; C. B. S., of Mass.; E. T. M., of Mass.; I. H. C., of Ill.; C. H. T., of L I.; D, C., of Pa.; J. A. D., of N. Y.; W. A. J., of La.; S. I., of L. I.; T. S., of Pa.; F. S., of N. Y.

Important Items.

☞ Complete Sets of Volume XII Exhausted.—We regret that we are no longer able to furnish complete sets of the present volume. All the back numbers previous to No. 27 are entirely exhausted.

Give Intelligible Directions—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

Subscribers to the Scientific American who fail to get their papers regularly will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can usually have them supplied by addressing a note to the office of publication.

Terms of Advertising.

Twenty-five cents a line each insertion. We respectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

☞ All advertisements must be paid for before inserting.

Science and Art.

To Polish Stones and Shells.

The art of cutting and polishing stones is very ancient. It was common in Hindostan and China long before the Christian era. Engraving is a modification of stone cutting. All the hardest gems, such as rubies, sapphires, topazes, &c., are cut with powdered diamond, and afterwards polished with a wheel dressed with tripoli. Many of the common pebbles on the sea beach and the river courses, when polished, are exceedingly beautiful.

There are many very pretty stones picked up by mere chance, and which are treasured by some persons for the recollections they bring to mind of places and friends, as much as the brightest jewel that adorns a diadem. These "lucky stones," "milk stones," "plum pudding stones," &c., become really ornamental for the mantel-shelf when brought to a surface and polished. If the stones are large enough to be held in the hand, the first operation is to grind them on a piece of flat brass or iron, which is coated over with coarse emery, and kept constantly wet; this requires both time and patience, depending upon the relative hardness of the same. When a flat surface is obtained, the process of polishing may begin. For this purpose fine emery is used, to remove the marks of the coarse; this is followed by tripoli, and, finally, putty of tin. The last material does not require water, but is merely dusted over the brass or iron plate, and the stone rubbed upon it till at length a beautiful polish is obtained.

The process of grinding the Brazil pebble for spectacle lenses is precisely the above, only that in place of a flat plate the worker uses a convex or concave tool. If the stones are too small to be conveniently held in the hand they must be fixed into a body of cement, and a handle made of it. Common sealing-wax will do for cement, but if a little pitch is added it is all the better. The stones have merely to be warmed to make them adhere to the cement.

For polishing shells a piece of woolen cloth dredged with emery, wetted, and rubbed upon their surface, brings them to a smooth face; they are then polished with a cloth and putty of tin, like a stone.

Shells of a very uneven surface may be varnished; they then assume a brightness as if polished. This trick is often practiced by those who sell shells. This kind of polish does not remain like that done by hand.

When a stone or shell is polished it exhibits its colors and grain by the reflection of the light. Half the stones worn in rings and seals are of no earthly value beyond the labor bestowed in cutting and polishing.

SEPTIMUS PIESSE.

Improved Porte-Monnaies.

The peculiarity of the porte-monnaie patented by Mr. John L. Mason, of Germantown, Philadelphia, Pa., October 16, 1856, and which forms the subject of the present notice, lies in the construction of the compartments. The muslin is so folded that the sides and ends of the compartments, whether they be more or less in number, are all formed from one piece of material instead of, as usual, making the sides of one piece and each of the ends of another piece, secured by stitching or pasting.

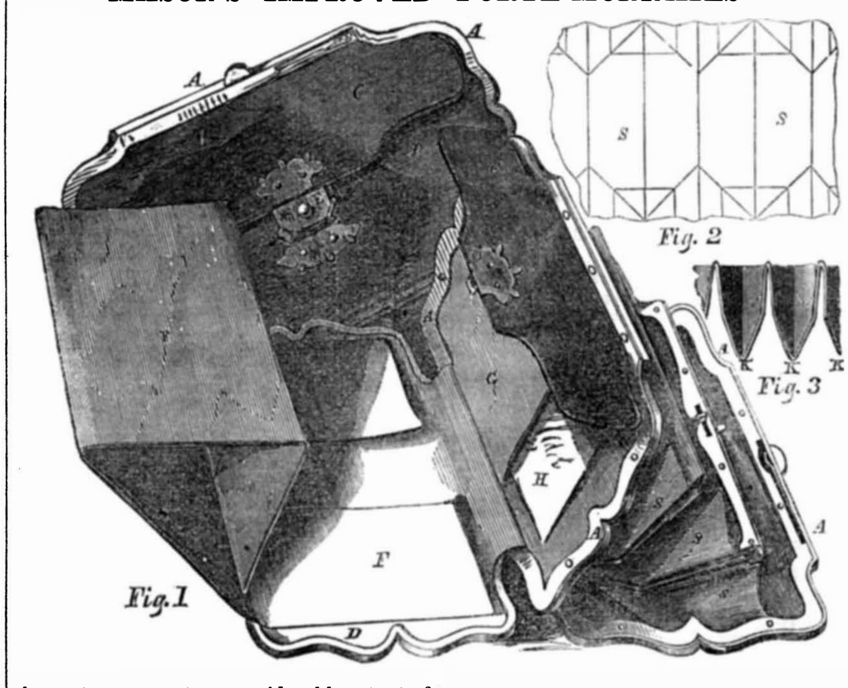
The article is very tastefully and conveniently got up in other respects, as shown by the engraving, in which fig. 1 is a general perspective view of the device in two situations. The front one is open, and displays its interior, while immediately behind it is another in a shut condition. Fig. 2 is a piece of suitable material—muslin or silk usually—spread out to show on a smaller scale, the locations of the lines along which the folds are made. Fig. 3 is an edge view of the compartments or pockets, fully completed from one piece, and ready to be secured in the frame of the porte-monnaie.

The metallic frame, A A, is first fitted as usual with the sides, which may be of leather, mother of pearl, papier mache, or any other material. In the specimens represented, the face or side nearest the eye is provided with an extra attachment, C D, in two parts, joined by the clasp, E, and enclosing suitable means, F, for enclosing bank notes. An additional provision is also made by the pocket G for the retention of cards, H.

S represents the material which forms the regular pockets. The lines along which the folds are made are shown very distinctly in fig. 2, and the form of the slanted corners produced at the lower part of the edges is shown in fig. 1. The side view in fig. 3 shows that the construction allows of as wide a stretch or opening as any of the methods in common use, although it will readily be seen that, like all other pockets in porte-monnaies, the lower angles are necessarily crowded very nearly together, as they are very near the hinge of the frame, A.

The superiority of this invention lies in the greater strength and durability of the pockets, and in avoiding the necessity for stitching

MASON'S IMPROVED PORTE-MONNAIES.



the parts, or even to a considerable extent of pasting. The pockets are made to come up into the top of the clasp instead of joining them to the clasp in the bottom and sides, as is done in the old porte-monnaies; and by this method they are independent of the outsides at the bottom, so that if the outsides should be worn through at the hinge, no change could get out there, and from their closeness to the top, the smallest coin cannot get over. From the nature of the folding, the spaces between the pockets are elastic, and give to the parts joined to the outsides when the clasp is pressed back, and when closed, the pockets being almost independent of the clasp on the inside, follow the outsides as they are pressed out.

Further information concerning it may be obtained by addressing the inventor, J. L Mason, Germantown, Philadelphia, Pa.

New Method of Printing.

The following method of printing is described in the last number of Newton's *London Journal*, and secured by patent in England as the invention of J. B. D. Chevalier and N. R. O'Sullivan, of Paris. It has for its object to obtain printing surfaces as a substitute for lithography, over which it claims to have advantages, not only in cheapness, but in printing a number of colors at once, whereas in lithography each color has to be worked off separately. It is described as follows:—

"In carrying out the invention, the patentees take any suitable permeable substance or fabric, such as linen, calico, cloth, canvas, or other woven or suitable material, or, it may be, a reticulated metal surface, or metallic plate or sheet, perforated with minute holes, to impart the required degree of permeability, and on this surface they draw or write the characters in an ink composed of lampblack, Indian ink, gum, sugar, and salt.

A coating of this ink being applied to the permeable surface in the form of the design or character or characters required, they next coat the permeable substance, on the side drawn upon, with a thin coating or film of gutta percha, or of gelatinous material, covering the drawing as well as the other part of the permeable material. When the coating of gutta percha or other gelatinous material is dry, the fabric, or other surface so coated, is washed. The gutta percha, or gelatinous material, at that part where it comes in direct contact with the permeable material, adheres firmly thereto; but at those parts covered by the ink it has no such adhesion, and simply holds to the ink design. The ink, being readily soluble in water, is removed in the washing, and carries away the gutta percha covering it; thus the design drawn upon the permeable material is now the only pervious part remaining on the surface.

The back part of the pervious substance or fabric is now to be coated with the ink or color or colors required to be printed, and the ink or color having been applied, the impression is taken from the face of the fabric or substance by pressure in a suitable press, the paper or surface to be printed being placed in contact with the face of the fabric or printing surface, the ink or color passes through the pervious part, and is thus applied and printed on the paper.

Instead of applying the ink or color to the back of the pervious material the design in that material may be placed on a pad containing a reservoir of ink or color, by which the ink or color is supplied, by pressing it upon such pad, from which it passes through the pervious parts of the material constituting the design to the paper or substance placed on the face of the printing surface to receive the impression."

The Hot Springs of Arkansas.

A writer to the New Orleans *Picayune* gives a graphic account of these springs. They are situated in a steep, rocky glen, between almost perpendicular, thinly wooded mountain, having for accessories a pretty brawling stream, a considerable village strewed on one side of the brook, and one little mill busily at work. The main hot springs gush out of the face of the mountain about eighty or one hundred feet above the base. The water is pure and limpid, and its entire body would fill a pipe of sixteen or eighteen inches diameter, if all issued at one spot. The temperature varies from 105° to 153° of Fahrenheit. The water, although apparently pure to the eye and palate, deposits a mixture of silex and carbonate of lime, forming a lava-like stone. Baths are arranged where hot vapor issues from the foot of the mountain, to which the water is carried from the springs above, so that the bather may have either a vapor or a hot water bath.

Sowing Flower Seeds.

Small seeds are apt to be buried too deep, or they are left on the surface, and a burning sun scorches them, or the soil is stiff, and, when wet, wraps them round so tightly that no air can get at them. The soil should be made very fine before sowing. If the soil is the least adhesive, a little fine, sandy soil should be used for covering, and then success will be more certain.

A Locomotive Log Splitter.

In number 23, this volume, SCIENTIFIC AMERICAN, a California correspondent, J. C. Gore, inquired if there were any machines in use for splitting logs. We answered "there were not," but that the thing could be done, only it would require a very powerful engine to effect the object. Mr. Gideon Davis, of Lloydsville, Ohio, has sent us the description of a method to do the job in locomotive style. It consists in having a huge horizontal railroad ram on a truck, which is to dash up and bunt a huge wedge into the log, (firmly fastened on a bed) and thus split it open in a twinkling. The plan is perfectly feasible.

Literary Notices.

CONSTRUCTING, HEATING, VENTILATING AND MANAGING GREENHOUSE GRAPERIES.—This is the title of a handsome volume, illustrated with numerous woodcuts, edited by Robert B. Leuchars, of Boston, Mass., and published by C. M. Saxton & Co., No. 140 Fulton street, this city. The author is a garden architect, and appears to understand his business. The object of the treatise is to spread abroad practical information on the points indicated in the above caption. It is a work which supplies a want long felt in scientific gardening, and will no doubt be hailed with delight not only by gardeners, but all those who possess greenhouses. Price $1·25.

ZILLAH: THE CHILD MEDIUM. A Tale of Spiritualism. By the Author of "My Confession," "The Story of a Woman's Life," &c. The writer of this book professes to be an unbeliever in modern spiritualism, and yet she thinks, after all, that the phenomena in connection with it are destined to affect very materially at some future day this good, free land. A somewhat interesting story is manufactured out of the crude materials which this system has developed. Messrs. Dix, Edwards & Co., publishers, 321 Broadway, N. Y.

WESTMINSTER REVIEW—The number just issued of this able quarterly contains eight powerful essays. "The Effect of Gunpowder on Civilization," and "Glaciers and Glacier Theories," two of the essays, have interested us deeply—the first is of general interest, and full of instructive information. Published by Leonard Scott & Co., No. 54 Gold street, this city.

THE EDINBURGH REVIEW—The present number of this, the oldest of the Quarterlies, is one of the best ever issued. Its leading essay is a review of Grotes' History of Greece, especially the life of Alexander the Great—it is an able criticism. The Physical Geography of the Sea is an article reviewing Prof. Maury's work on this subject, and is very interesting. It also contains eight other excellent essays besides these two. Published by Leonard Scott & Co.