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## poctry.

THE MIDNIGHT WIND

## BY WM. MOTHERWELL

Mournfully! O, mournfully
The midnight wind doth sigh,
Like some sweet plaintive melody Of ages long gone by
It speaks a tale of other yearsOf hopes that bloomed to dieOf sunny smiles that set in tears And loves that mouldering lie!

Mournfully! O, mournfully This midnight wind doth moan; It stirs some chord of memory In each dull heavy tone : The voices of the much loved dead Seem floating thereuponAll, all my fond heart cherished Ere death hath made it lone.

Mournfully! O, mournfully This midnight wind doth swell With its quaint pensive minstrelsy, Hope's passionate farewell To the dreamy joys of early years, Ere yet grief's canker fell On the heart's bloom-ay ! well may tears Start at the parting knell

## THE STAR OF LOVH.

Now darkness veils the gilded skies, And shrouds a slumb'ring world; And night looks down with thousand eyes, Her banner wide unfurl'd.

Still as the silent halls of death, Tired nature takes her rest,
Hush'd is each lingering zephyr's breath That fann'd her peaceful breast.

Amid the radiant orbs that deck And concave as they roll, Not one has light enough to break The gloom that haunts my soul.

Shine on my soul thou star of love, While that revolves round thee, And wheresoever thou dost moveThera shall its orbit be.

Though darkness veil the gilded skies, Yet still there's light from thee; Night darkens not thy jeaming evesThy smile is day to me.

The Paths of Life.
Two paths hath life, and well the theme
May mournful thoughts inspire, For ah, the past is but a dreamThe future a desire.

## True Pollteness.

Never ridicule, or point the finger of scorn at a person because he is less wealthy than yourself. Many a great man and brilliant genius have been the victims of poverty, while accident has raised simpletons and even idiots to stations of affluence and power. The true principle is to treat every person with proper respect, no matter whether he be rich or poor.

The Flemington, N. J. Copper Company have, it is said, recently struck a rich vein of ore, yielding 58 per cent of pure copper.

## ELECTRIC IMPROVEMENTS

Figure 1


Figure 3.


Figure 2.


This is an invention of Mr. C. Hill, of London, for improvements in the Electric Telegraph apparatus, and relates to enclosing the conducting wires in tubes of lead and drawing the tubes with the wires in them to an extreme fineness. The wires are dipped in rosin before they are enclosed in the tube. The tube is then filled with hot rosin, pitch and tar, and while these materials are hot the leaden tube is passed through a series of rollers, represented by Fig. 1. The pipe is run through a chamber, A, full of hot water to keep the non-conducting materials hot. The tube 0 , passes through the centre and then enters between rollers $c$, an end view of which is seen Fig. 4. $f$, is the frame, and $g$, the handle. These rollers have semi-circular grooves in their peripheries which by their junction form a circle about one eighth of an inch less than that of the external diameter of the tube These tubes, or tube, being made to pass between the rollers by their being driven by hand or otherwise, the lead pipe is reduced in diameter, but increased in length, and then goes through another set of rollers $d$, to reduce the tube still more until it is drawn closely round the wires, when it is received on $e$, a drum. (The tubes might be drawn through draw plates and would answer the same purpose as between the rollers.) The whole is then covered with coarse yarn. Fig. 2, represents the wire at different parts during the different stages. The tube $b$, is exhibited as being wrapped round with the cord $c$, after which it is plunged in a bath of hot pitch and while the pitch is hot it is rolled in sand and rubbed with the hand, filling up all the interstices between the strands of the rope as seen at $d$, and the whole is then further protected by laying it in a cast iron pipe $e$, so that it can carry wires across rivers, lakes or seas. Fig. 3, represents an improvement in steadying the needles used in telegraphs and the means of bringing them to a state of rest, after having been moved to the right or the left. $a b$, are the needles supported on a bent

## An Antique.

A plaingold ring was found by workmen who were digging a culvert on Ferry wharf, Boston, a short time since, which had on it the following inscription: " J. Fitch, ob’t. Oct. 26, 1739, Æ 27."
axle $c$, and kept in a vertical position by the lower end being heavier than the upper. The axie is supported by two pins or points $d e$ one of which rests in a conical hole formed in a piece of agate $e$, or other hard substance in serted in the brass frame work $f$, the othe point resting in a groove cut in the othe piece of agate $k$, in the direction of the length of the axle. The needles vibrating freely from the points $d e$, are prevented from be ing jerked out of their position from any sud den impulse of the electric fluid by forked arms- $g$, represents a correct view of these arms. These arms $g$, receive the crank axle the same being in a line with the centre of motion The foregoing is a plan for suspend ing the needles which are brought to a stat of rest by a small cup of oil placed in a po sition so that when the needle is perfectly vertical, the point of it just dips in the oil, the friction of the point passing through the oil when it vibrates and its vibration thus ar rested. This object, however, may be effect ed by filling the cup with filings, the point of the needle coming in contact with them, or a small block of iron will answer just as wel as tne cup of oil.
As the science of Electro Telegraphing is but young and now engages much attention, there is something in every new patent to in terest electro scientific men. Mr. Hill constructs his magnets by winding his wire round a thin cylinder reel, then he introduces his soft ba: of iron into the reel and applies his electrical current in such a manner as will tend to draw the soft oar through the centre of the reel. The usual way to make these mag nets, is to wrap a coil of covered wire round a core of soft iron, which is magnetised by transmitting a current of electricity through it, the perfect filling of which depends upon the purity of the core. It will be uncerstood that the magnet must be somewhat less in diameter than the cylinder or reel, in which it is to be enclosed.

Opposition to the Telegraph
The news of the Revolution in France w carried by an express locomotive from London to Glasgow, 472 miles in 10 hours. The hour.

## RAIL ROAD NEWS.

The legislature of this State has passed a general Railroad law, under which capitalists may associate to construct railroads, without the right of eminent domain, however.
The Northern Rallroad Company have lately applied to the Legislature for a bill authorising them to bridge the outlet of Lake Champlain. It is highly probable that the request will be granted, and that the work will bs immediately put under contract. The proposed bridge, when constructed, will establish a perfect connection between that road and the roads in Vermont.

## Atlantic and Paclic Rallroad

Should the treaty with Mexico be ratified, we predict that not many years will pass, before the two oceans will be connected by steam power, via the Rio Grande Nature has done her part towards the improvement, and art will yet do hers. There are no great physical obstacles to be overcome, as is the case further south, whether at the Isthmus of Te huantepec or that of Darien.

From the Paso del Norte to the mouth ot the Gila, on a direct line, is about 600 miles. The best practicable route for a road from the most accurate information we have been able to obtain, will not exceed 800 miles-making the whole distance from the Gulf of Mexico, via Paso del Norte, to the Gulf of California, 1300 miles.
The head waters of the Gila are directly west of Paso del Norte; second they are only distant 115 miles; third, that there is already a high rcad opened, not only to California, but also through the state of Sonora, to the lower end of the Gulf of California; fourth that the Gila is a rapid mountain stream, 30 feet wide and in the shoalest places one foot deep, (and this at extreme low water, as we learn elsewhere, and must theretore afford ample water for a large canal which might be made from this point down the Gila to the Gulf of California ; fifth, that a Railroad could be made without difficulty, connecting Paso del Norte and the Gila. The mountains between the two oceans are not very high, they can easily be surmounted by American genius and enterprise.

Quebec Rallroad.
A bill has been introduced into the New Brunswick House of Assembly which proposes the issue of $£ 100,000$ in Provincial scrip, bearing interest at 6 per cent, and redeemable in thirty, forty and fifty years, to be loaned to the Company formed for the construction of the St. Andrews and Quebec Railroad.

## Champlain Rallroad.

A meeting of the directors of the Ogdens. burg and Champlain Railroad was lately held in Boston and the most energetic measures taken for the early completion of the whole work. Sixty miles of the road will be ready for the rails the early part of next autumn.A portion of the remainder in the month of April following, and all by the first ot July succeeding.

A Railroad is to be built between the towns of Lawrence and Manchester in N. H.

The Massachusetts Legislature have granted a charter tor a railroad between Salem and Lowell.
Mr. Ellett, the engineer and contractor of the Niagara Suspension Bridge has stated that by the 1st of June next the work will be so far advanced that he will be able to cross on horseback.

Several new Telegraphic lines are to be put up between Buffalo, Detroit, Chicago and other lake towns.


Recent Fires.
A fire broke out in the Sugar House at the corner of Broadway and Duane st., last Sabbath morning. We are sorry to add that one of the walls fell down, killing almost instant ly one of the assistant engineers, Mr George Kerr, and killing instantly Mr. Henry Far gis, foreman of No. 38. A great number gis, foreman of No. 38 . A great number
were also severely wounded. No less than were also severely wounded. No less than
47 fires occurred in our city last month, and 47 fires occurred in our city last month, and
some of them were very serious. New York some of them were very serious. New York
has been called the city of fires; we have too many sheds and fugitive structures, and this is the cause of frequent fires.
A large Grist and Flour mill has been burnt down at Cohoes Falls, N. Y. Loss \$20,000.

On March the 28th, the Home Printworks at Central Falls, R. I., were the scene of a terrific explosion of a boiler, and ten persons lost their lives.
On March the 3rd, a most disastrous fire occurred at Watertown, N. Y., and much property destroyed and two lives lost.
A boiler lately exploded in Lewis Street, Boston, and killed Mr. McLaughlan the engineer, and scalded a workman.
The cotton factories at Amoskeag, N. H. were burnt down lately. The fire is said to have caught from some defect on the chimney.
A small satine: factory, situated about a mile and a half east of the village in Leicester, on the road to Worcester, Mass., took fire two weeks ago from friction, in the picker, and was entirely consumed with most of its contents.
We might fill a number of pages with such disasters, but we have no feeling to dwell on such sad events. We point to these accidents and only say to our ;eople be more careful, for we are convinced, that many accidents, though not all, are the result of carelessness.

## Splendid Fire Engine.

Mr. Andrew Agnew, of Philadelphia, has lately built a most magnificent Fire Engine, named the Vigilant. The body is of highly polished American walnut, with pretty pannelings, enriched by elaborate siiver corner piecesand mouldings, and having centre pieces of rich and ornate design. The gallery baffles description. It presents the appearance of a great and gorgeous silver vase, tinted with gold. It is supported by four enfoilated columns of choice workmanship, which, while they give the design no heaviness, remove the notion of mere tinsel or tawdriness. The notion of mere tinsel or tawdriness. The
wheels and arms are of polished hickory; and wheels and arms are of polished hickory; and
the levers are polished metal. The levers are worked from the ends and sides, by means of arms so adjusted that the members stand upon the ground. The levers fall upon metal spiral springs of which material also the hubs and axles are made; the hub, besides, forming and comprisirg the box. The water is let in at the bottom of the box; above which the valves are placed, and the side apertures for the reception of the hose and the discharge of water are said to be of a greatly improved character.

## A Preclous Volume

A princely bequest has been made to the British Museum, by the Hon Thomas Grenville, of London, lately deceased. It consists of a rare and valuable collection of books, exceeding twenty thousand volumes, and val. ued at 100,000 pounds. Among them is a copy of the Bibla Sacra Latina, on vellum, the first book printed with moveable types. It was printed at Mentz in 1450-5, by Guttemburg and Faust. This edition is called the Mazarin Bible on account of a copy having been found in the library of Cardinal Mazarin. This is so rare that but four copies in vellum and fourteen on paper are known to exist, all of which are in public libraries.

Earthqurke at Batavia.
Letters from Batavia, in the Island of Java.
of 20 state that on the 16th, 17th, and of Feb. 20, state that on the 16 th, 17 th, and 18th, shocks of earthquake were felt at Batavia, and in the regencies of Cheribon, Bon joemak, Kaddock, Samarang, ond Rambay. A Batavia, the towers of the church were a good deal shaken and that of the town-hall had taken a strong leaning to the left, whilst a cross in cast iron, which summounted it was overthrown. In the lown of Cheribon all the buildıngs except the stores, the walls of which are of great thickness, were so much injured as to threaten destruction, and oblige the inhabitants to seek refuge in the plains the inhabitants to seek refuge in the plains
of the environs. At Parimang the residence of the Governor was thrown down, and all that it contained destroyed. Forty houses in the Chinese quarter shared the same fate, and seventeen inhabitants were crushed to death under the ruins. A great number of sugar and indigo manufactures in the open sugar and indigo manufactures in the open
fields were destroyed. Intelligence from all points of new disasters was reaching Batavia, and the greatest alarm prevaled in that cap. ital.

## The Doom of our World

The North British Review, says :-" What this change is to be, we dare not even conjecture, but we see in the heavens themselves some traces of destructive elements and some indications of their power. The fragments of broken planets-the descent of meteoric stones upon our globe-the wheeling comet wielding their loose materials at the solar surface -the volcanic eruptions of our own satelite -the appearance of new stars and the disap. pearance of others are all foreshadowed of that impending convulsion to which the system of the world is doomed. Thus placed on a planet which is to be burnt up, and under heavens which are to melt away, thus treading as it were on the cemeteries, and dwe?ling on mausoleums of former worlds, let us learn the lessons of humanity and wisdom, if we have not already been taught in the school of revelation."

## The Bonaparte Family.

The only surviving brother of the late Emperor Napolean, Jerome, is we believe, now in France, having asked leave of Louis Phil ippe, some time since, to reside in the kingdom. He will be remembered as having married Miss Patterson of Baltimore, about 1803, and by that lady he left a son, now, we believe, living in Maryland Jerome repudiated his wife, by direction ot his brother, and afterwards married a German Princess. He was for sometime King of Westphalia.
Louis Napoleon son of the late King of Holland, Louis Bonaparte, and of Hortense daughter of Josephine, lately escaped from prison in France, and has now returnedthere from England, on hearing of the Revolution.

## A Fatal Carouse.

In the devastation and burning of the chateau of Neuilly some bandits rushed into the apartments, whilst others went to the cellars, The latter there found wine of all descriptions and a cask of rum, which they broke open Some instants after they were all drunk, and then a terrific battle took place between them, their principal weapors being bottles. At length they fell to the ground overcome by intoxication or wounds. Meanwhile the men who went into the apartments ravaged and pillaged them completely, after which they set them on fire, and the whole building was soon in flames. A short time after, the men in the cellars weie either burned to death or suffocated. On Sunday from one hundred to one hundred and twenty dead bodies were dug out.-Journal des Debats.

## Tea Plants.

An enterprising citizen of Charleston, $S$, C., has just received from Canton, from an em bassy to that country, six varieties of the seed of the Tea plant, together with directions for its culture. The seed resembles in some measure the small sized ground artichoke.

## Steel.

Of all bodies steel is the strongest. It requires a force of $115,000 \mathrm{lbs}$. to tear asunder a tempered steel rod the area of which is one inch.

| The Atmosphere nevor Dark on a Windy |
| :---: |
| Night. | Several years since, says a writer in the Ma-

gazine of Natural History, when travelling by night in the mail coach, in the depth of win ter, and during the absence of the moon, was surprised to observe, that though dense clouds covered every part of the horizon, and not a single star could be seen, yet the night was far from being dark, and large objects near the road side were easily discerned. On expressing my surprise to the driver, he replied, " The wind is very high, and during a grea many years that I have been upon this road I never knew it to be dark on a windy night." The observation was at that time new to me; but subsequent experience has convinced me that it was true.

Strange Phenomena.
A correspondent of the Buffalo Daily Express states that the water at Black Rock fell in one night, the 28th ult., three feet, and no evident cause for the same. At Niagara Falls on the same night, the water that fell over the Falls looked more like a mill dam than the mighty waters of Niagara River. On the nighe mentioned above, all the mills at the Falls were suspended for want of water which had caused no little astonishment and well it might if the story is true.

Iron Convention.
The Iron Manufacturers' and Miners' State Convention met in Harrisburg, on Wednesday, last week. It was a very respectable and intelligent body. Delegates were in atendance from various states. A number of resolutions were passed, and Committees appointed te collect statistical information with regard to the Iron and Coal trade, the consumption of Agricultural products, \&cc.

## The Wooly Horse.

The wooly horse caught on the Rocky Mountains and which has been exhibiting in some of our Southwestern Cities, is the very ani mal caught by Baron Munchausen, and which has the strange quality " that it can't live on land and dies in the water." It will soon vi sit this city and its coating of pitch and wool will no doubt be a subject of curious investigation. The above intormation is for the benefit of all those who love to study the wonders of gullability.

## Whitfield's Habits.

Whitfield's habits were singularly nice and cleaxly, upon the principle that everything about a minister should be "spotless." He was known to say that he could not die easy if his gloves were out of place. He had the gertlemanly love of order, which required his table to be elegantly spread, even if only a loaf, or his favorite dish, a cow-heel, were to be seen uponit.

A New Way to Make Steamboats Swift
Asteamboat called the Dupont, in Philadelphia, which once had two of Loper's propellers in her, was wonderfully improved lately, by taking one of them out, and leaving the other in.
Query.-Would she not do better with both oxt.

## Anti Assassin Shirt.

The Heraldo, a Spanish paper, states that a man had arrived at Madrid, "whose body bullets cannot enter." He proposed being publicly shot at by the soldiers of the garrion, and also by a machine of his own which lets off several muskets at the same time. He puts on a garment the tissue of which resists the entrance of any bullet.

The Baltimore Mechanics' Fair.
There is to be a grand Mechanics' Fair at Baltimore on the 17th of May next. Mr. Benson, the inventor of the new Rotary Engine is Superintendent. We shall notice this Fair gain, and in the mean time bid the Maryland Mechanics get their models all bright and ready.

New Canal.
A new canal is contemplated from Buffalo to the canal dam below Black Rock, N. Y.The object is to procuie a full supply of water to the enlarged Erie Canal, independent of the mill privileges.
The word "apple" in the book of Genesis should hav $\epsilon$ been translated " citron," according to Dr. Parkhurst.

Rome exports its rags and imports them manufactured into paper ; exports its cows and oxen, and imports its butter and cheese; exports its raw silk, and imports it when manufactured ; exports its raw wool, and imports it again the form of broadcloth; imports olive oil from Tuscany, and wax and honey from wherever she can get them.
Buffon, says the Journal de Reims, gives a aven's life as 200 years. The other day a gentleman captured one, round its neck was a silver plate, with an inscription in Engish :-""This raven, caught by Capt. Duncan of the Scotch Guards, in Garrison at Rheims, was set at liberty, Jan. 7, 1643."

A new machine for watering the streets, called Rough and Ready, has been invented in Philadelphia.
We want thousands here, why don't our City authorities put up hydrants with perforated nozzles to lay the dust. Broadway is sornetimes like Sahara, in spite of the Croton.

There is a new boat nearly ready for action in this City for the North River trade. She has a stroke of 14 feet long, and her cylinder we believe, is scarcely three feet in diameter. Experience will test either its follies or fame. We are not upon the fence regarding it, although the builder is an eminent mechanic.
At Cologne, a suspersion bridge is about to be thrown over the Rhine by French engineers, similar to that which crosses the Danube at Offen. It will rest on a single pillar in the middle of the stream-and is to cost 159,000 thalers.

The Cleveland Herald states that saleratus to the amount of 221 tons or $442,000 \mathrm{lbs}$, was shipped from that place by the canal last year. There are in Cleveland four manufactories of this article, all of which are doing a good bu= siness.
A Swan was caught last month, on the Monongahela River, by James McAnich.It is pure white, three feet and a half high, and a very beautiful bird.
A number of students have been suspended from the Genessee Wesleyan Seminary, N. Y., for initiating a pedlar by a moek ceremony of Odd Fellowship.
The Peace Society has issued a circular which terminates thus :-" Arbitration is friendly-wise-easy and cheap. War is fien-dish-foolish-difficult and dear."
Some excellent sugar has been raised on the St. Johns River, Florida, by Col. McIntosh. One hundred and fifty barrels have sold for 5 cents per pourid.
A glass Company has been chartered by the Legislature of Tennessee. An abundance of the best sand for glass manufacture has been found in that State.
The Jackson Cammittee at Washington, have adopted Mill's plan for a bronze equestrian statue of Gen. Jackson. It is to be made of the cannon captured by Gen. Jackson at New Fort Hamilten.
Mr. F. J. Wood lost his life recently on the Potomac. He went down to the bottom of the river in Captain Taylor's submarine apparatus and in fifteen minutes afterwards he was taken up dead.
M. Boussingault states in the Annales de Chemie, that experiments have shown that cattle fatten better on fodder steeped in water than when given to them dry.
Twenty-six thousand lashes were inflicted in the British Navy last year. Forty-eight was the highest number inflicted at any one time.

Bread is selling in England at a lower price than ever has been known ; the best bread is $5 \frac{1}{2} \mathrm{~d}$. per quarter loaf.
A wag put the sign of a cutler one night on the watch house in New Orleans, and the people next morning read the plain fact above the door, "Blades put in here."
In China a man condemned to death can procure a substitute by paying about three hundred dollars.

## For the Scientific American.

## The Carpet Manufacture.

(Concluded from our last)
In order to preserve as much as possible the form and regularity of the several coils made by each thread and set of threads, a round the cylinder, after they are taken therefrom, and during the process of washing and steaming them, it is proper to pass a small cord of worsted amongst the convolutions, under and over them alternately, tying its ends together. This interlacing of a cord across the several coils may be applied at two differert places of each set of coils, before they are taken off from the cylinder, and it will facilitate the winding afterwards upon bobbins, as it will preserve the threads from en tanglement.
The warp being thus composed of partycolored yarns, suitahly variegated with colors and arranged in suitable order in the warp, according to the intended pattern, the weaving is to be conducted in the usual manner o what is called plain weaving, and will produce a fabric with a figured pattern in color without any of the troublesome manipu lations which are necessary for what is called figure weaving.
According to the ordinary mode of weaving Turkey carpets, the weavers must have in use as many different skeins or clews of different colors as the variegation in his pattern requires, and must select first a skein or clew of one color, and then another, with discre tion to suit his pattern; he will, according to this improved mode of Mr. Whytock's re quire to use only one skein or clew of yarn, which, being rendered party colored in due order of succession of colors, will furnish all the variation of coloring necessary for forming the successive tufts which he will require in his work, and following each other in due order as they will be wanted. And as he works up the skein or clew of party colored yarn by putting in tuft after tuft, and cutting off the yarn each time, those succes sive tufts will change their color according to the intended order of succession of color which the pattern requires, without any trouble of selecting colors and changing skem with perpetual reference to the pattern, as heretofore, but only occasional references thereto, and without the same liability to mistake in so selecting, and the waste of colored yarn which is occasioned by such mistakes: and also, the number of ends re maining from the number of sleeins which must be used, will be much diminished by rendering the yarns party-colored. By this mode of party-coloring the yarns, the join ings of the patches of color which were applied successively, will indicate the exact place where the yarn is to be cut off as the tufts are introduced, whereby waste of material in cutting off too long may be avoided, as well as imperfections in the face of the work by cutting off too short. [Note.-A saving of coloring material may be made in rendering the threads for Turkey carpets par-ty-colored, by omitting to apply ar,y color to those parts of the yarns which are afterwards to be looped or knotted around the threads of the warp, and which parts will therefore only appear at the back of the fabric, and will consequently require no color; these omissions can be easily made in their proper places along the party-colored threads, by setting out the pattern so that those parts of the threads will be known when they are wound round the cylinder, and may be passed over without applying any coloring matter thereon. The places which are left uncolored in the threads will be extremely useful as indications to the weaver of the places where the tufts are to loop and knot around the threads of the warp.-Gilroy.

## The Size and Age of Trees

The traveller Adamson discovered in India a baobab tree to which the largest oaks would be mere saplings, and the stem of which measured from 80 to 120 or 130 feet in girth. As they could not cut a tree down every time they wished to ascertain its age, they measured it, and thus formed an approvimate guess. They thus cume to the conclusion that baobabs existed for five thousand years. The celebrated cypress of Mexico
was at least as old, if not older still than
these. It must be remarked that the deluge did not destroy the trees, sirce the dore brought to Noah a branch of the living olive brought to Noah a branch of he living oliver Milan, by which it was ascertained that a cy. press which grows in that city was in existence in the time of Julius Cæsar. Now that tree is only twenty six feet in circumference while the Mexican cypress was 120 feet. There was nothirg in the constitution of trees at present existing to prevent their living on to the end of time, whether measured by hundreds or thousands of years. There has been exhibited a section of the largest branch of a yew tree which grew at Forthampton, Gloucestershire. It was nine inches in dimeter, yet 228 perfect and distinct rings culd be counted in it. Decandolle from an xanination of number of yew tres, tained that the average amount of its growth aterally was three-twelfths of an inch in a year. The circumference of the whole tree was twenty-seven feet, and hence its age would be 1370 years. This lands us in the time of the Saxons ; and we have not the east doubt that there are yews still in existence which began to grow long before the Romans marched over Britain. At Fortingal, a village among the Grampians in Scotand, there is a yew teee the age of which must be more than 2,500 years. It is evident that, as the vitality exists in the liber, the tree can go on constantly pushing forth its fresh rings of wood, when the centre is dead: the vital principal is still working, and seems as if it could go on forever.

Protecting Wall fruit From Insects. The ant occupies a distinguished position s a depredator on wall-fruit. No sooner has an insect " of a larger growth" commenced he destruction of a fruit than these little pests assemble in myraids and complete the demolition: and this is often carried on by means of a minute aperture in the cuticle of he fruit next the wall, so that some of our finest fruit is often destroyed ere we become aware of the fact. The usual wasp-trap is of little or no service in the destruction of the nt, and even muslin bags, so effectual for he exclusion of flies, \&c., are often ineffec ua!. The best remedy for the prevention of he attacks of the whole insect race is com mon tow or hemp. As soon as the fruit, rom its ripeness, begins to become attractive envelope a thin coating of this substance packing it well between the fruit and the call, and no insect will venture to molest it The fine filaments of the hemp form a comlete chevaux de frise to their attacks. Even the minute ant fails to penetrate them A fine crop of peaches, which were required to be preserved for a particular occasion was treat $d$ in the manner described, and out of several dozen from one tree, not one fruit had the least blemish from the attack of an insect

## Egypt and her Ancient Arts

The hieroglyphic system of Egyptian wriing, like the Sanscrit of India, was sacred it was the most ancient of all lang ge and is the depository of the records of the monumental annals of a mighty empire. In its nature it was alphabetic, symbolic and pictorial. Its meaning was conveyed through the medium of sounds-the names of things, and pictures of the things themselves. The representation of a lion, for example, might a a symbol, mean the anımal itself, or might convey the qualities of his power, or alphabetically, it might express the letter L These three modes of hieroglyphic writing were used singly or together, and were inci dent to great obscurity from this undermix ture. All of the sculptural history of Egyp is transmitted in this system.
For the recording of continuous events, leaves of the Papyrus, an aquatic plant of the Nile, and slips of fine linen were used. Numerous rolls of this species of manuscript are found in all the temples and tombs, and their secrets have been revealed by science Champollion perfected a key to the entire system. The process was to decipher the characters-next to interpret the words the furiiied. To accomplish this last process,
it was necessary to refer to the ancient Coptic language.
The excavations of the French explorer
exhumed a new book of Monumental Egyptian history. Upon the immense walls of the tombs and temples were spread out pictorial or sculptural representations of all the econvmy of Egyptian life, with the arts and occu pations, customs and costumes of all grades vocations and professions. Volumes could not have contained such exact and copious de tails of the most minute facts and events in Egyptian history. The enti'e social economy of the Egyptians, 1800 years B. C., with a delineation ot all their mechanical vocation and the progress of artisans thus set forth with wonderful truthfulness and vividness, ar faithfully represented in Rosselin's Plates of monumental history. These pictorial delin eations prove that many arts which have been supposed unknown to antiquity, were as well understood then as at the present day. The manufacture of glass and porcelain, and of fine linen-the imitation of precious stones with glass, and the staining of that material, afterwalds for ages lost. Thebes, 4,000 years ago, if less advanced than the 19 th century in some respects, is thus proven to have ta surpassed it in others. Astronomical discoveries and tables prove, alsp that the wise men of Egypt must have possessed the art of bringing scientific instruments to a high degree of perfectness; and the minutest sculp turing on some of the hardest porphyry, dem onstrate that the artisan's tools must have pos sessed the keenest edge and most exquisite temper. The principle of the Artesian Well as also that of the Railway, was plainly known and practised. The engraving of cameos, the tempering of copper, and the manufacture and use of burning glasses, were also known; while the elevation of the enormou lintels on the domes of the temple of Carnac and the position and removal from great distances of other vast and ponderous masses o stones, prove the possession of motive and mechanical powers now lost. The motive principles possessed by the Egyptians could not be so applied at the present time. By means of these powers and arts, were constructed those mighty and mysterious masse or architectare which have been the wonder of all subsequent ages-those giant sentinels of the dead past,-labrynths whose rocky masses imitated the heaveniy zodiac-huge statues with the semblance of the shadowy phantoms of a Titanic race, and whole tem ples of siennite marble, transported a hun dred miles fromits bed!-and the dread and awful pyramids, next to the works of Omnip otence, the mightiest on our earth. Yet, all these, to the spectator, gazing down from the summits of the porphyry mountains of th Nile, seem but the fragments of the architec tural skeletons of an elder time, whose spire glither amid the blue heavens, but whos depths were based in blood.

## Coal on the Paclfie Coast.

The Valparaiso Neighbor of October, 1847 says:-The prospects of obtaining coal from the neighborhood of Conception have lately become very fine. By the last accounts the promise was excellent both as to the amount to be had, and as to quality of the coal. A gentlewien writing from Talcahuana states hat ene mine has been opened on land lying at the right hand of the road leading to Conception, in which a seam of coal has been ound one and-a-half yards thick. In the tide way of Phinco they are working another, sume 200 yards from the keach, and have cut vertically to the distance of ten feet. And have not passed the coal even at that. Then a third has been opened at the Pareles, also on the side of the road to Conception. The coal obtained from this is of most excelient quality. In all there are now five mines, and the main question at present is to find a purchaing demand equal to the supply.

## Longevity.

There is nothing in the system of nature, which, in our present state of knowledge, appears so unintelligible as the scale of longevity. It must be admitted, indeed, that our knowledge, upon this subject is very imperect, for all that is known of domestical animals, and the accidental facts which have been preserved concerning others, teads to ation either to strength size complexity
organization, or intellectual power. True it is, that birds, which seem to rank higher than beasts in the scale of being, are also much longer lived. Thirty is a great age for a horse: dogs usually live from fourteen years otwenty; but it is known that the goose and hawk exceed a century. But fish, evidently lower rank in creation than either, are ionger lived than birds; it has been said of some species, and certain snakes also, that they grow as long as they live, and as far as we know, live till some accident puts an end o their indefinite term of life. And the toad, it cannot indeed be said that the toad lives forever, but many of these animals who were cased up at the general deluge are likely to live till they are baked in their cells at the general conflagration.

Decease of a Mechanic Naturalist
There lately died on his passage from New Orleans to Liverpool John Miller, who had been for sixteen months in our western wilds collecting and preserving rare specimens of birds, reptiles, insects, \&c. Though only a working man, and laboring under the disadvantage of poverty, and a very limited education, he displayed a skill and shrewdness in the pursuit of his favorite study, which stamped him as a man of very superior abili ies and natural talents. Through a strong desire to explore different parts of North America in quest of birds and other natural curiosities, he contrived to save a few pounds by dint of rigid perseverance and economy, and sailed from Liverpool on the 17 th of Septem ber, 1846, in pursuit of his favorite object He remained eight months about St. Louis, in killing and preserving animals, support ing himself during that time by preparing and selling specimens amongst the inhabi tarts. The assiduity with which he followed his pursuit, and the variety of climates he had to encounter, brought on an illness, under which he labored six months, gradually growing worse: in which condition he em barked at New Orleans for England, and died after being about a month on the passage The specimens of curiosities he had acquired, consisting of birds, insects serpents, and oth er things, have been carried to Liverpool He left a widow and seven children

## Schilier's Use of Bodily Suffering.

I have often been acquainted with persons both men and women, in whom this condition of (constant bodily suffering) was habitual, and who had not even a single probable hope of ever getting free from it unless by death To this class, especially, Schiller belonged He suffered much, suffered constantly, and, knew too, that as was actually the case thes perpetual pains were drawing him nearer to death. Yet of him it might truly be said that he kept his sickness imprisoned within the limits of his body; for at whatever hou you might visit him, in whatever state you might find him, his mind was always cheerful and tranquil, and ready for friendly in tercourse, and for interesting and even pro found conversation, He would even say, a times, that a man could work better in cer tain states of bodily aliment,-not those, of course of acute suffering, and I have found him, while actually in this uncomfortable conảition, composing poems and prose essays in which no one, surely, could discover trace of this circumstance of their birth.Letters by W. Van Humboldt.

## The Bond of the House

The English term "husband" is derived from the Abglo-Saxon words hus and band which signify the "bond of the house;" and it was ancieatly spelt house-bond, and continued to be spelt in some editions of the En glish bible, after the introduction of the art of printing. A husband then, is a house-bondthe bond of a house-that which engirdles the family into the union of strength and the oneness of love. Wife, and children, and "stranger within the gates"-all their inter ests and all their happiness are encircled in the house-bond's embrace, the objects of his protection, and of his special care. What


## New $\mathfrak{I m v e n t i o n s . ~}$

## New Cioth Measurer.

Mr. A. A. Erskine, of Eaton, Madison Co., N. Y. has invented a new and simple apparatus for measuring and rolling narrow cloth at one operation. The cloth is taken from the press and placed upon a cushion in the machine, from which it passes to a drum one yard in circumference where it is measured, and passes thence among friction bars to a shaft where it is rolled up in a nice square roll ready for the market. While it is being measured and rolled up the papers are deposited upon a shelf in a nice compact pile.This machine saves all the time generally bestowed upon cloth after pressing, except starting the machine and registeriag the number of the piece and number of yards, for it may be left with perfect safety to perform its work. It has been used about six weeks, during which it has been examined by manufacturers and others and approved by all. It is very simple and can be got up in good style and warranted to work well, for fifty or sixty dollars delivered without transportation. Measures have been taken to secure a patent.

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New Screw Driver.
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We have received drawings from Mr. L. V. Badger, of Boston, of an improvement in Screw Drivers, which we think is. valuable and exhibits not a little ingenuity. It is a plan of a driver for screwing up large screws and gives all the power that is required for that purpose, something which the common screw drivers lack, unless they are made too large for quick and neat workmanship. We may be able to present at some future period an engraving of this neat and convenient tool.
improvement in Sawing Machines. Mr. Daniel Woodbury, of Perkinsville, Vt. has invented a machine for irregu!ar sawing, such as circles and bevelled work and for cutting timber for ship building, which from its great simplicity and apparent utility, we consider to be very valuable. It is not socomplex as Cochrane's and it requires no grea expense to attach it to any sawmill. The bevel is regulated by a moveable circular frame and bevels can be cut to any degree with the utmost accuracy.

Steam for Extingulshing Fires Some experiments have been made this and last week in Williamsburg near this city, to show the superiority of using steam in place of water for extinguishing fires. Mr. S. Broad head is said to have a patent for this discove ry and the experiments were to test its merits. A large tar barrel was filled with combustible materials and set on fire, being well supplied with air through holes bored in the sides. A tube from a steam boiler under a pressure of sixteen pounds conveyed the steam through a hole in the bottom of the burning barrel and the flames were instantly extinguished.
The invention is ostensibly for extinguish ing fires in vessels and the patentee's plan is to distribute tin tubes through the steamer, any one or more of which may be connected with the vessel's engine, and made to throw a head of steam into any part where there is fire, or where it is supposed to be, if its actual location cannot be ascertained. The cost of fitting up a large ocean steamer with an apparatus for instantly drowning out of fires in any part of her, is estimated at $\$ 300$.
The principle of superiority in steam over water for extinguishing fires lies simply in the sudden expansion of the compressed steam, a principle long known and frequently experimented with for this purpose, but with very faint hopes of being extensively adopted.

## Stannete of Tin.

Mr. Church Greenwood, of Lancaster, England, has taken out a patent for some new chemical agents to be used in the dyeing and
printing of cotton and woolen fabrics. Two of these agents are stannate and stannate or tin. The stannate is made by putting into an iron crucible heated to a low red heat 22 lbs. of caustic soda, 8 lbs . of nitrate of soda and lbs. of common salt. The mixture is gradu ally raised to a fluxing heat and when defla gration takes place 10 lbs . of dropped block tin is added and the whole stirred with an iron rod This compound when cool is powdered for use or it is evaporated and crystalised and has only to be dissolved to make one of the best mordaunts ever used.
Another process is to take 4 lbs . of common salt, $13 \frac{1}{2}$ lbs. of sal soda and 1 lb . of nitrate of soda. These are to be raised to a red heat in an iron crucible and 4 lbs . of the dropped o foliated block tin added. These salts make most excellent dyer's liquor and we hope see them adopted in our manufactures.


This is a sectional view of Messrs. Teller D Dillenback's Moveable Bucket Reaction Water Wheel. This wheel was described and its principle explained in No. 18 of this volume of the Scientific American. This en graving gives the exact shape and position of both the stationary and moveable buckets in combination. It is a vertical wheel and the water is admitted through the scroll A. D, is the shaft. B, represents the stationary exte ior buckets and C , the vanes or slides that can regulate the discharge. It will therefore be distinctly observed that the speed of the wheel can be kept up at the same rate by al ways having the scroll full, although the quantity discharged may be varied as desired. This is a most important improvement in having a uniform speed, although there may not be a uniform supply of water.


This is an improved Faucet invented by Jeremy W. Bliss, of Hartford, Conn. Its value and importance will be fully understood by the following description of its mode of contruction and operation.
$B$, is a valve working under the mouth of he crooked nosed pipe A. D, is a hul, in which is secured a bolt, extending through the pipe and handle or thumb-nut, and tightned by a nut at E. F, represents an inclined plane or wedge, connected with the pipe, which serves to compress the valve against he mouth of the pipe, when closed. C C, represent ribs on the under side of the valve, or strengthening the same The valve is worked by the handle or thumb-nut.
Measures have been taken to secure a paent on the above.

Wheat Dibbling Machine.
Mr. Oonway, of Warrington, Lancashire, England, has invented a machine for dibbling wheat so as to supersede the broad cast sowing. It is generally admitted by practical
men that dibbling or setting wheat is not only the oest, producing the most profitable crops but effects a great saving of seed. The only objection against dibbling, as compared with the present system of broad cast, being the amount of labor absorbed. Much opposition has been manifested by the working classes of England against his machine, as it performs more work than thirty men by hand dibbling but it seems that although it does a great dea of work it requires much attention. At a public meeting in Warrington Mr Conway, by the aid of his machine, performed in twenty five seconds as much work as took two expert dibblers seven minutes and a half-thus prov. ing to a demonstration that it would do all that the inventor promised. The meeting was quite astonished at the novelty and easy work ing of the machine, as it requires no stooping, the man working it while standing in an upright position. After inspecting the machine, the meeting came to the following resolution: "That it is the opinion of this meet ing that the wheat dibbling machine invented and constructed by Mr. Conway, will annwer in a remarkable degree all the purposes for which it was invented, and is a very important improvement upon the present system."
Sach a machine, however, could not be profitably used in America, broad cast is more profitable by far here than all the benefits derived from dibbling.


This engraving represents the mode of ope rating the valves of the engine referred to in a previous number of the Scientific American. It is the invention of Mr . William Mack of Canandaigua, N. Y. who has one engine of four horse power in operation. We mention ed betore that measures had been taken to get a patent. This engraving represents a single valve and explains the priaciple fully.

A, is the piston working in the cyilinder and the piston rod through a stuffing box. B, are staples that operate the lever $D$ and valve C. It will be observed that when the piston A strikes B , the connecting rod D immediate ly operates the valve $C$, by sliding it down when the steam is exhausted by the channe H , and it escapes through the opening G F is the induction or feed pipe that admits the steam into the steam box by which it is immediately applied to the piston, as represent ed in the engraving. The passage for the feed and exhaust are much wider than those in common use-this is a necessity for the play of the lever staples B, which are screwed fas in them. E, are levels for reversing the motion, which can be done with great ease and speed. The valves themselves or itself, is the common slide valve principle, the most sim ple and best valve of all, and just remove the pressure of the steam altogether from acting on it but in the one direction, and it is perfect.


## LIST OF PATENTS

## ssum from the united states patent

 office,For the week ending March 28, 1848.
To David Bruce, Jr. of Williamsburg, N. Y., for improvement in Type-smoothing Machines. Patented March 28, 1848
To Edward Kellogg, (administrator of Geo. C. Kellogg, deceased,) of New Hartford, Conn. for improvement in Wool Pickers. Patented March 28, 1848.
To Edward S. Blake, of Allegheny Co., Penn., for for improvement in Electrical Machines. Patented March 28, 1848.
To Benjamin F. Shelabarger, of Mifflintown, Penn., for improvement in Joiners' Planes. Patented March 28, 1848
To David George, of Granville, Ohio, for improvement in Hollow Augurs. Patented March 28, 1848.
To James R: Stafford, of Cleveland, Ohio, for improvement in Cooking Stoves. Patented March 23, 1848. Ante-dated Sept. 28, 1848. To William M. Gooding, of Newark, N. J for improvemen: in Wrought Nail machinery Patented March 28, 1848.

To William Blage, of Sharon, Ohio, for improvement in fire and weather proof compositions or Artificial Slates. Patented March 28, 1848.
To Lewis Tupper, of Genoa, N. Y. for im. provement in Washing Machines. Patented March 28, 1848.
To Sylvester M. Pye, of Acquackanock, N. J., for improvement in Fastenings for Doors. Patented March 28, 1848.
To Isaac Knight, of Baltimore, Md., for improvement in the running gear of Railroad Car Wheels. Patented March 28, 1848.
To Elijah Murray, of Paducah, Ky., fo improvement in Windlasses. Patented March 28, 1848.
To J. Bishop Hall, of Philadelphia, Penn. for improvement in painting on translucen surfaces. Patented March 28, 1848.
To Lewis Smith, of New York City, for improvement in machinery for splitting Match Splints, (having assigned his right, title, \&c to Benona Howard) Patented March 28, 1848. designs.
To William P. Cresson, David Stuart and Jacob Beesley, of Philadelphia, Penn., tor Design for Stoves, (said. Stuart and Beesley having asigned to said Cresson.) Patented March 28, 1848.
To Philip Garbielle, of New Orleans, La for Desiga of Bust of Gen. Z. Taylor. Pa tented March 28, 1848.

## INVENTOR'S CLAIMS

## Gas $\bar{P}$ ipes.

By Joseph Battin, of Philadelphia, Penn Improvement in Hydrostatic Stops for Gas Pipes. Patented 18th September, 1847. Claim -Having thus fully described the nature and operation of my hydrostatic gas stop, what I clam as new therein and desire to secure by letters patent, is the manner in which I have arranged and combined the respective parts thereof so as to effect the purpose herein named, that is to say, I claim in combination the use of a tank furnished with a partition which shall operate as a water trap or seal, and with tube for supplying and drawing off the water, the gas being admitted into the upper part of said tank, and the whole arrangement and operation being the same as that herein described and represented. And I do hereby declare that I do not claim either of the parts of which said seal or trap is composed, as itselı new ; but I limit my claim as above set forth, to the particular arrangement of said parts so s to adapt it to the performance of the affice for which it was designed.


NEW YORK, APRIL 8, 1848

Iron is the most valuable of all metals : and although it is not estimated to be of equal va lue with gold, yet our remark will not be invalidated for incorrectness, any more than if we compared coffee or spirits with pure wa er by a just standard of intrinsic worth. Iron has the remarkable property of being welded, in other words, two separate pieces of iron like the fabled serpents of mythology, can be united together by heat and the action of the hammer. Platina alone of all other metals, has this same quality. This is one property in iron which makes it so valuable, becaus it can be forged into so many different shapes It is therefore used for almost every purpose such as house building, ship building, machi nery of every description, in medicine and for coloring. Within the past ten years iron has been applied to a greater variety of purposes than ever could have been anticipated by the most sanguine philosophers of old. To some of these applications, namely, bridge build ing and tunneling, we would desire to direct attention for a few moments.
Suspension bridges are no longer problematical, they have been "weighed in the ba lance and not found wanting." But although success has attended suspension bridges and genius and skill have triumphed over suppo sed impossibilities, yet no sound practical man can doubt for a morrent that there is a limi to the extent of our powers-a line beyond which man cannot extend the sceptre of me chatical dominion-a line beyond which the laws governing practical mechanics, so far as we understand them yet, seem to be suspend ed. The fall of the Dee Bridge in England aroused attention to the subject on both sides of the Atlantic, and there has been a wise set tling down of the Scientific to schemes of perfec practical utility, and not Icarus like, attempt ing flights to the sun on waxen wings. W would not, however, be supposed to speak word against experiment, but would only cau tion against the supposition that experiment successful on a small scale will all be equally so on a large scale. Science and art have now been carried to such a state of perfection that it is almost impossible to define its limits -ts point out the lme of demarcation which bounds the empire of mechanical genius. Tu bular bridges are rising up on the other side of the Atlantic like the mighty works of the fabled Titans. A single iron tube has been thrown over the river Conway in England, which weighed 1300 tons-as heary as some of our largest packet ships. An iron bridge will soon span the gulf of Niagara, and countries that have been separated for ages by th furious waters of the whirpool will then be linked together by a metal dug from beneath the dust upon which we tread This is truly the age $0^{4}$. iron-iron intellect and iron enter prise.

## Method of Silvering Cast Iron

The combination of iron with carbon, cas iron, from the ease with which it melts, and the consequent possibility of taking the fines impressions of form, has come into very ex tensive application. The art of founding, con verts cast iron into enormous arches, col umns, cannons, and also into the most deli cate bracelets. ear-rings, \&c. Unfortunately the moist atmosphere very soon alters the surface of these objects, and it is found necessary to coat them with paint, which gives the cast iron a color which is of itself no very attractive-the appearance of mourning. In the present state of the art of founding east iron might easily be substituted for bronze were it not for its sombre appearance, which entirely excludes it. This disadvantage may however, be entirely overcome, from the possibulity of platirg it with silver ; in fac cast in on may be readily silvered, and equally
as well as copper and bronze. The liquid for silvering is prepared in the following manner, viz. :-Cyanide of potassium is introduced into a stoppered vessel, and freshly prepared pure chloride of silver, still in a moist state, added, the whole being covered with water, and shaken violently for some time at the ordinary temperature. An excess of chloride of silver is taken, and should a small quantity of it remain undissolved, a few more of the cyanide are added after some
time, taking care however, to avoid having time, taking care however, to avoid having an exzess of the latter salt, but always a small quantity of undissolved chloride at the bottom of the vessel. This last circumstance is important, because when the liquor contains too much free cyanide of potassium it is easily decomposed, and moreover does not silver so well ; before employing it, it is filtered, and is thus rendered perfectly clear, iron and a litle chloride of silver remaining on the filter. The plating is effected by means of a galvanic pair of plates, consısting of zinc and a coke cylinder, which are separated from each other by means of an earthen diaphram. The pair are placed in a glass vessel containing dilute sulphuric acid, and dilute nitric acid is conveyed into an earthen diaphram Experience has shown that the best mixture for the coke cylinder should consist of 5 parts by weight of finely pulverized coke, 6 arts pulverized coal, and 2 parto of common ye flour. When the cylinders are dry they are placed in earthen crucibles, in the lids of which there is an aperture for the escape of he gasses, and are then heated to redness. Those cast iron objects may be most easily silvered which have not been panted, as the emoval of the paint from the surface is some what-dificult. The cleansed object is immersed in the silver solution, and connected with the zinc pole by means of a conducting wire, and a platinum plate immersed in the liquid at some distance from the object to be silvered, and connected with the coke cylinder. A plate of cast iron, of 5 square inches surface is generally completely plated in 30 minutes.

## The ruass Pavement.

Roman roads, Macadamised roads, Railroads and Plank roads have become "famous in sto$y$," but there is another kind of road destined to be as famous as any of them, namely the Russ Pavement, the invention of Horace P. Russ, of this city. Cobble stone pavements, lock pavements and rosin pavements, have been weighed in the balance and found want ing, but the Russ pavement is just beginning to shine, and shine it must as there is " scarce any wear $\theta^{\prime}$ t." This kind of pavement is now being laid down in front of our office, and we have a good opportunity to judge of its merits. We have no hesitation in saying that if all the streets.in New York were paved with it, our city would possess more splendid paved streets than any city ever possessed, either ncient or :nodern
The Russ pavement is made by first laying foundation of dry concrete well beetled down, then a second substrata of wet concrete made with small split stones and plaster.This substrata is laid down in pannels to give access to pipes and conduits below. The frames of these pannels have an edge thinned upwards to allow the concrete to be lifted out If required to get at water sipes and gas pipes below for repairing. Upon the top of this concrete is laid a strata of heavy granite blocks nearly square. These blocks are haid down cross the causeway at right angles with the sidewalks and are beetled down solidly upon the concrete strata, a little sand being used
for levelling. These blocks are about
ts or levelling. These blocks are about 15 inches long, 9 inches in breadth and 12 to 15 nches in depth, so that of themselves the would make a good pavement just embedded in sand, but being laid down upon the concrete
strata and the pavement rounded but very strata and the pavement rounded but very
slightly for draining off water, it makes a most substantial and perfect causeway. The block being laid down so that the abraiding action of carriage wheels will traverse the blocks in curves differing from the planes of clevage is a good and scientific plan to make more permanent the most durable system of street par ing ever introduced into our city. Mr. Russ secured a patent for his substrata on the 14th of last month.

For the Scientific American conomy of Power in cotton Factories The rapid increase oi manufacturing estab lishments in our country during the last ten ears, has so enhanced the value of water privileges, that a good mill site cannot b purchased so as to make water much cheap $r$ as a motive power than steam.
This circumstance has led scientific men to investigate the best mode of applying wate to wheels to obtain from a given quahtity it maximum effect. And no doubt many curiou facts, and much useful information has been brought to light upon the subject, yet after all that has been said and done, we are of opinion that, in the proper manner of communicating power from the first mover to the several ma chines, the manufacturer has a study mor worthy his attention in point of economy than is presented in determining what kind of wate wheel shall be adopted. No practical man can visit our older manufacturıng establishments without noticing the clumsy arrangement of their main shafting, the ponderous apparatus by which it is set in motion and the exceedingly small number of spindles and looms they can operate, compared with the apacity of their water wheel.
There are several particulars, which if duly considered by the manufacturer before erect ing his mill, would not only give it a much neater and more compact appearance, at a les expense, but also an advantage in the saving ot power, of more than twenty per cent ove one where they have been neglected. A few of these we shall briefly notice, hoping some of your correspondents, whose age and experience enable them to do so, will take up the ubject and treat it with greater ability.
The walls of a cotton mill ought to be con structed of brick or stone, and in no case of wood. The latter will always shrink and swell with changes of the weather, thereby throwing the main shafting " out of line, and causing an almost incalculable amount or friction in the bearings. This by the way is the occasion of so many wooden mills taking fire, and not, as some may suppose, the combustible nature of the materials
A warm sun after a rain storm striking on part of the building while the other is sha ded, the former will shrink first, and the shaft ing running the whole length must " bind" somewhere; if in a place not exposed to view the lubricating substance is dried up, and heat enough may be generated before it is discoverd to set the mill in a blaze.
Whether built of brick or stone, a solid foundation is the first requisite, and should never be compromised. If the site does not naturally furnish this, no expense ought to be spa red in creating an artificial one. Having finished the building, the heating apparatus should be completed, so as to keep the seve ral apartments at the highest temperature during, at least, six weeks before the shafting is fitted up. The mackinery should also be placed on the floors in the mean time. This will give opportunity for the timbers to shrink and the floors and walls to settle, (a circumstance which always takes place to a greater or less extent, according to the nalure and quality of the materials used,) without interfering with the machinery and shafting, a these are to be levelled in their places afterwards.
The means used for conveying power from the first mover to the line of shafting, if not in accordance with correct principles will ve ry materially diminish its effective power.The superiority of belting over shafts and gears for this purpose is now generally conceded. Indeed while nearly all the recently erected mills have adopted the former method many of the older ones have substituted it for the latter.
The principal advantage of belting, results from the greater speed at which the line shafting can be driven with much less weight on the bearings than when shafts are usedfor example, if 60 horse power is to be conveyed from the first mover to the third story of a building, say 36 feet, by east iron shafting performing 100 revolutions per minute, something over four tons of metal would have to be employed, while six hundred pounds of belting would answer the same purpose.-
This of course saves extra weight on the first
mover equal to the friction caused by $3 \frac{1}{2}$ tons It is ascertained by experience that a belt 15 inches wide, moving at the rate of 3000 feet per minute, will convey 50 horse power. If however the belt should be 17 inches wide, it could be run much slacker, and make no more riction on the bearings that if 15 inches.The error of making the belts too narrow has been made in every mill with which I am acquanted. As a general remark, machine ma sers should make all pullies for belts about ne third wider than has been done hitherto. This would not only economise leather, but riction to an amount which would not be credited without actual demonstration. The mooth side of leather should be turned towards the pullies or drums, which should al so be covered with leather.
W. Montgomery
(To be continued.)
Model of the Steamship United States. This steamship built for Mr. Marshall of this city, and intended to ply between this port and Liverpool, has some peculiarity in her model which from her successful trial trip has led many to believe that she will beat any thing afloat. She certainly gives fair promise but " let not him that putteth on his armor boast," is an old and a very prudent rule of guidance. We will content ourselves to abide the results of a fair voyage. New York beats he world for ships and for marine steamer she will not be behind.

Another or Hoe's Presses.
The Boston Times has been compelled by its large circulation to procure "Hoe's fas press." There are only five of these presses yet in use, but they will soon engross all others. The first and second of them were used o print the Philadelphia Ledger, the third nd fourth were made for the New York Sun The fifth is that now in possession of the Boston Times. The sixth and seventh are eing made and nearly completed, to be put up in the office of the New York Herald, and the eighth and ninth are ordered for Paris.

## A Rich Man Gone.

John Jacob Astor, but a few days since the ictrest man in America is now rich no more in this world's goods. He is laid with the lods of the valley. Hę died on Wednesday, of last week. Concentrated wealth is dange ous in a Republic, but by our no-law of primogeniture inheritance, Mr. Astor's great wealth will soon spread in a thousand channels Standing beside the grave of the rich, how forcibly cometh to our hearte, the thrilling warning, "lay not up for yourself treasures upon earth, but treasures in heaven."

## Mission of Education.

The British Government have resolved upn sending out pioperly qualified schoolmas ers and schoolmistresses to the colonies in different parts of the world, to conduct the public schools established there for the instruction of the natives.

Sientific American--Bound Volumes,
The second volume of the Scientific Ame ican, bound in a superb manner, containing 416 pages choice reading matter, a list of al the patents granted at the United States Patent Office during the year, and illustrated with over 300 beautiful descriptive engravings of new and improved machines, for sale at thi office-Price $\$ 2,75$. The volume may also be had in sheets, in suitable form for mailing t $\$ 2$.
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For the Scientific American.
Rumsey the first Steamboat Builder. Mr. Fditor:-The history of Fitch and his steamboat in No. 17, reminded me of a con-
versation I had lately with an old gentleman of the name of Dunham, who has been spending the winter in our place. He said he bad seen the first steamboat evar built (as he supposed) and that it was built at Shepardstown, Virginia, by Charles Rumsey. During the time Rumsey was building his boat, Dunham was Rumsey was building his boat, Dunham was
attending school one or two hundred yards from the river and had an opportunity of seeing it every day. This boat resembled a canal boat, and the only part of the machinery visible on the outside was the top of the boiler, which rose above the deck, and some pipes from the top of the boiler which bent down into the inside. The boiler was made of two into the inside. The boiler was made of two
hollow halt globes with a wide flange on each hollow halt globes with a wide flange on each
by which they were bolted together, and holding a barrel or more apiece. One half of the boiler was afterwards used at Shepherd's mill to cook hog feed in, and was still there some ten years ago. Dunham did not see the inside worke and could not say any thing about them. The boiler and other castings were made at a furnace just below Harper's Ferry. He told me the names of the persons who worked the boat, but I do not remember them. He remembers distinctly the time the boat was first started. There were something near five thousand persons collected on the banks of the river to see Rumsey's folly, as it was called. When all was ready to start Rumsey invited all who wished, to get on board, but there were but five who did so, Colonel Morrow, then a member of Congress, Colonel Drake and son, Henry Bedinger, and one other whose name he does not remember. The boat first started down stream but soon turned and went up four or five miles and back at a rate that the people walked up and down stream and kept alongside. A short time after this the river rose suddenly, and the boat breaking from its fastenings, was carried down stream a short distance and dashed to pieces, where parts of it remained for several years. Shortly after this trial Col. Morrow took Rumsey to Congress with him and endeavored to have an appropriation rade for him, but did not succeed. Mr. Dunham thinks this boat was built as early as 1784, but is not certain.
Mr. Rumsey was a tall, spare, dark complectioned man, and very sedate.

Yours respectfully,
L. G. M.

Bellefontaine, Logan Co., Ohio.
More about Gutta Percha.
The tree from which Gutta Percha is procured, belongs to the natural order sapotacee pore, and in some dense forests at the extremity of the Malayan Peninsula. It attains a considerable size, even as large as six feet in diameter; is plentiful in Sarawak, and most probably all over the Island of Borneo. The timber is toolloose and open for building purposes: but the tree bears a fruit which yields a concrete oil, used for food.
Gutta Percha is contained in the sap and milky juice which quickly coagulates on exposure to the air, from 20 to 30 pounds being about the average produce of one tree. For collecting the sap, the trees used to be felled, barked, and left dry and useless.
This way of getting the sap would soon, from the great demand of the article, have destroyed entirely the source from whence it is procured, but from late accounts the trees are forbid to be felled, and the sap is only
taken from them like as from the caoutche taken
tree.
The gutta is received in scraps, or in rolls of thin layers. It is first freed from impurities by devilıng or kneading in hot water, when it is left soft and plastir, and of a whitish gray color
When thus prepared, the Gutta has many curious properties. Below the temperature of 50 degrees, it is as hard as wood, but it will receive an indentation from the finger nail. When softened in hot water, it may easily be cut and moulded; and it whll harden, as it cools, to its former rigidity; and it may be softened and hardened any number of times without.injury tr the material. Unlike ca-
outchouc it has no elasticity; but it has such outchouc it has no elasticity; but it has such
tenacity, that a slip one eighth of an inch
thickness, sustained 42 lbs. weight, and only broke with a pressure of 56 lbs . When draw cut, it remains without contracting.

## Coal Field on James River Virginia.

This coal field, which is about twenty miles lung from north to south, and from 4 to 12 miles in breadth from east to west, is situated 12 miles west of Richmond, in Virginia, in the midst of a granitic region. The rocks consisting of quartzose grits, sandstones and shales, precisely agree in character with the ordinary coal-measures of Europe. Several rich seams of bituminous coal (the principal one being occasionally from 30 to 40 ft thick,) occur in the lower division of the stra ta, which are arranged in a trough, and are rnuch disturbed and dislosated on the margin of the basin, where they have a steep dip, while they are horizontal towards the centre. The fossil plants which have been determined by Mr. C. Bunberry, differ specifically and most of them generically, from those found tossil in the older or paleozoic coal for matiors of Europe and North America, and resemble the plants of the oolite, of Whitby, in Yorkshire: some few, however, being alli ed, to fossils of the European trias. From he upright position of the Calamite and Equiseta, it has been inferred that the vegetables which produced the coal, grew on the spots where the coal is now found, and that the strata were formed during the continued sub sidence and repeated submergence of this part of Virginia. The shells consist of count less individuals, of a species of Possidonomya much resembling $P$. minuta, of the English trias. The fossil fish are nomocercal, and differ from those previously found in the new red sandstone (trias) of the United States. Two of them belong to a new genus, and one to Tetragonolepis, and they are considered by Prof. Agassiz, and Sir P. Egerton to indicate the liassic period. The analysis of the coal made by Dr. Percy, and Mr. Hen$y$, shows that it contains the same elements carbon, oxygen, hydrogen, and nitrogen in the same proportions as the older bitumi nous coal, of Europe and North America Alternating layers of crystalline coal, and oth. ers like charcoal, are observed in many places, and in the charcoal Dr. Booker has detected vegetable structure, not of Ferns or Zamites, or any Conifer, but perhaps of Calamites. The coal yields abundance of gas used for lighting the streets of New York and Philadelphia, and some fatal explosions have taken place in the mines, some of which are 900 feet deep. Volcanic rocks, dikes, and beds of intrusive green stone, intersect the coal measures, in several places, hardening the shales, and hardening the associated coal, he latter being in some places turned into a coke used largely for furnaces.

## An Alabama Coal Field

Near Mr. Camp's bloomery a few miles below Scottsville, the junction of the coal may be seen, the latter being almost vertical while the coal measures are inclined at an angle of 20 degrees. Near this place fragments of coal are imbedded in the sandstone. My examination of the Cahawba coal field xtended as high up as Lacy's ferry, about thirty miles above Centreville. In this disance its greatest breadth is directly west of Montevallo and is about twelve miles. From the little Cahawba which is its southern boundary, to Lacy's ferry, is 20 miles An undulating line drawn from Shultz's creek near Scottsville, and following the ridge east of the limestone to Roup's creek, will mark its western boundary. On the east it extends o within one or two miles of Montevello, from which point it gradually contracts till it reaches within three miles of the ferry.
The coal of the Cahawba differs in many res ects from that of the Warrior. It is more lamellar in its structure, seldom breaking up into fragments of regular form like the atter. The beds are generally more highly inclined, being often vertical, and they are also much thicker than any I have yet seen on the Warrior. On the right bank of the Cahawba, I have determined the super-position of at least four beds, varying in thickness between ten and four feet, and within one or two miles of the river. These beds are
low in the series-some of then below the millstone grit, which leads me to think we have not yet reached the corresponding thick beds on the Warrior.
Between the coal and iron ore I bad the pleasure to find an excellent fire-stone that must one day be of great value. You have, then, limestone, iron ore, fire-proof stone, coal and water power side by side and within the limits of a few miles.-Professor Tuoney.

## Customs and Things.

In the twelfth and thirteenth centuries, good manners required that persons of different sexes, when invited to parties, should si down in couples, and each couple should have one plate between thern. In families, one goblet was deemed sufficient for all; and St. Bertrand was disinherited by his father, who was afflicted with the leprosy, for having wiped the edge of the goblet before he drank. Beds, now such indispensable pieces of furniture, were to the Greeks and Romans articles of great luxury. When they exchanged the leaves, and skins of beasts, on which their heroic ancestors reposed, for matresses, and feather birds, the bedsteads were sometimes ivory, sometimes of cedar, and sometimes of silver. It would be difficult, now-adays, in the middle ranks of life, to find beds such as our ancestors sle pt on, not only with their wives and their children, but with their dogs and their friends. An invitation to such couch was then considered the strongest procf of affection and confidence that could be given.
The first mirrors were made of metal. Cicero carries the origin of them up to Esculapius. Moses, too, makes mention of them. It was in the time of Pompey that the first mirror was made of silver at Rome. Pliny men tions a brilliant stone, probably tale, thin slices of which being fixed upon a bright metal reflected objects with great perfection. The first mirror of glass appeared in Europe in the latter end of the Crusades.

G Farsuits the best cuac of Grier Grief, of whatever measure it may exist, Gill always be most obstinate and dangerous in those unengaged in active pursuits, and who have consequently -leisure to brood over their troubles. Bodily and mental activity, and more especially, when the result of necessity must, by creating fresh trains of association, and diverting the thoughts into new channels, tend to weaken the poignancy of affiction. Nothing in truth, serves more effectively to lighten the calamities of life, than steady and interesting employment. It is, as we conceive for the reason that temales are generally exempt from the cares and excite. rnents of business, and confined at home to their own relatively tranquil domestic duties, that they so much oftener pine and sicken under wounded affections than our own more active and busy sex. Dr. Good observes that "suicide is frequent in the distress of sieges, in the first alarm of civil commotions, or where they have subsided into a state of calmness, and the mischiefs they induced are well pondered; but it seldom takes place in the activity of a campaign, whatever may be the fatigue, the privations, or the sufferings endured. On the fall of the Roman empire, and throughout the revolution of France, selfdestruction was so common at home, as at last to excite but little attention. It does not appear, however, to have stained the retreat of the ten thousand under Xenophon, and accor ding to M Falret, was rare in the Frenchar my during its flight from Moscow."

## Geological.

Mr. W. B Findlay, a farmer near Columbus, Illinois, in digging a well on his premi ses, at the distance of sixty-two feet below the surface came upon two pieces or portions of a log, of what was once no doubt a large tree. The bark upon it resembled that of the pine of the northern latitudes. The ground on which the well was sunk, is a high rolling prairle, and it would appear that the whole country was once covered 'vith water, for before coming upon the piece of timber, about 55 feet below the suiface, the diggers came upon what appeared to be a new soll, compoter.

The Clasp Conpiling Joint.
This invention of Messrs. West \& Thomp son, is creating no small excitement among our most eminent engineers and soientifi men. The British Attorney General has signed his name to an English Patent, and we shall soon be able to herald one from our own Patent Office. This would have been done already had Congress granted at an earlier date the necessary increase of force in the Patent Office. This joint has just been expe rimented with at the navy yard at Washington and the following testimonials and opinions regarding the qualities, is something of which the inventors may well feel proud. Coming as they do from men who are so justly able to form correct opinions, and who are above uttering anything but unbiassed opinions.
U. S. Navy Yard, Washington March 28, 1848.
This is to certify that by order of the Hon. Secretary of the Navy I have applied one of West \& Thompsons newly invented "Clasp Coupling Joint" on the steam pipe of one of the steam engines of the yard, for the purpose of testing its merits. It gives me pleasure to state that its application has been entirely successful, and also, that it is in my opinion tar superior to any method of connecting pipes that I am acquainted with. Its great superiority consists in the facility of its application and the entire certainty of its efficacy is well as in the economy of its manufacture the saving of material in its construction, and of time in its application in any situation where it may be used, compared with any of the old methods.
I would further state that I subjected one of these joints (2 1-2 inches diameter) connec ting two pieces of English cap welded tube to hydrostatic pressure for the purpose of ascertaining its strength and efficiency, and do also certify that the joint so connected stood a pressure without leaking or giving way, of 2,566 lbs. to the square inch.
Wm. M. Ellis, Chief Eng'r. \& Machinist.
I agree with the above statement.
C. S. McCauly, Commandant.

Having witnessed the trial of the above named joint when subjected to the pressure amed above, I certify to its correctness.
Wm. Sewel, Jr., Chief Eng'r. U. S. N

## Sound visible.

In this age of wonders, what will the world think when we assure it that a method has been discovered and matured by which sound will be made visible to the human eye, its various forms and ways demonstrated to sight and the power to discriminate between the tones of one musical instrument and another be as complete as to observe the action of water when disturbed by any material cause ? The experiments, 've believe, are likely to be, ere long, repeated in the Royal Society The exhibition of effects on fine sand has pro bably led to this astonishing issue.-Literary Gaz.
[Wonders will indeed, never cease, and truths can never be forgotten, and verily the fact of sound becoming visible reminds us of "sounding brass and a tinkling cymbal."

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ing curves by patterns is both ingenious and feasible to all appearance. An operative mo del would, however, as in all such cases af ford ground for pruning all that is extraneous
"E. F. S. of Geo."-We have received yours, have obeyed your orders and are much obliged for your kindness. You will see an engraving of Mr. Winder's pump in No. 1 of this vol. Scientific American. We do not know the price and they cannot be had in this city.
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"C.D. of Vermont."-We will give your communication due attention
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American Rallroad Journal
We receive this Journal regularly, and the publishers would hear from us it we did not It is filled with sound information especially relative to Railroads. It is published in Phil adelphia, No. 105 Chessnut straet, price $\$ 5$ perannum

American Phrenological Journal
This Magazine for Aprll is very interesting as all the numbers are. There is a cut in it of F. Hunt, Editor of the Merchant's Magazine, and a phrenological description of his character, which must be interesting to all who have a taste for this Science.

The Minstrel Pugrim
A neat little book of poems bearing the above title, has just been published by Clark and Austin, 205 Broadway.

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ine and other Steam Engine Boilers. d26 PROSSER, Patentee,
Platt ctreet, New York

## Johnson's Improved Shingle

 Machine.
 would request all those who want a goo tachine
for sawing shingles, to coll on him and tamine the improvements he has made, as one eight h mere shin
gles can be sawed in the same give. time than b gles can be sawed in the same give.1 time than by
any other machine now in use.
Augusta, Maine, Oct. 1,1847 . J. G. Johnson.


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the best mechanics in the country as regard some of the best mechanics in the country as regard
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## Machinists Tools.

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street, New York. G. B. HARTSON.

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Forthe Scientific American.
To make Lake.
Boil 4 ounces of cochineal and one halt an ounce of pearl ashes and then add a small quantity of the salts of tin and alum and wash them well, and dry on pieces of glass; if an natto is used with the pearlash it will be a good scarlet.

Boil three pounds of Brazil wood one hour in three gallons of salt water and then filter through clean paper while hot, also 5 ounces of alum filtered and 3 ounces pearlash filtered, stir all together hot and a sediment allow ed to stand and then dried on glass or earthen ware plates.
Another way is to boil 3 pounds of Brazil wood one hour with 3 ounces of salt in 3 gallons of water, and filtered hot, then to a solution of 5 ounces of alum in 3 gallons of wa ter add the colored liquor and then 3 ounces of pearlash in $11-2$ gallons of water filtere 1 and added gradually to the other mixture and left to precipitate. This is for a water paint but if half a pound of seedlac be used with the pearlash before filtering and 5 pounds in stead of 3 , be used of Brazil wood, it will work well with oil. Half an ounce of annatto to the pound of wood will throw it upon the scarlet shade, but it must be dissolved in pearlash, not in salt wate:.
cinnabar. vermillion
This is the sulphuret of mercury. Native cinnabar is sometimes found but not so pure as to make it fit always for use. Take of quicksilver 18 pounds, flower of sulphur 6 pounds, melt the sulphur in a pot and add the mercury gradually being gently warmed; stir with an earthen rod. If this takes fire extinguish with a wer cloth. When this mass is cold powder it so that it all may be well mixed together and then sublime it, when is to be ground well and washed carefully.
bleaching oil. gilding.
Pour about as much linseed oil into a shal low earthern vessel as will stand one inch in depth, then pour in six inches of water and let it stand covered with a fine cloth in the sun for a ferv weeks until the oil gets thick, when it is poured into a phial and submitted to a good heat, after which the clear is to be poured off and strained through a flannel cloth. To prepare wood work for gilding it should first get a coat of drying oil and a little ochre and vermillion mixed, then sized
the gold laid on. This is for gold leaf.
To prepare wood for burnished gilding must be prepared with parchment size. Take 1 pound of parchment cuttings or white leathe used by glovers and boil it in 6 quarts of water till the whole is reduced to 2 quarts, or when taking out a little it will look like a jelly, when it must be strained through a flannel and it will be fit for use. Wood for bur nish gilding should be first rubbed with fish skin or some better material, then it must be primed with the size mentioned above mixed with whiting by melting the size and strewing it with the whiting and stirring them well to gether. A nuraber of coats must be given and each one dried before the other is put on and then when the last coat is dry, it must be moistened with water by a linen rag. Then a composition of pure white soap thickened while dissolved in water to the thickness of cream by glover's size and diluted with water must be spread with a brush over the whole of the work and suffered to dry, and another coat given. After the last coat, the part to be burnished must be rubbed with a soft cloth until it be perfectly even. Some add a little vermillion to the gilding size and some color the work first with yellow and the size, or red lead and vermillion, this is to give the appearance of gilding to the deep parts of carving where the gold cannot be laid on, jut it more frequently happens that this work is colored after the gilding is performed by what is called matting. The work being thu
prepared it is wet with a camel hair pencil and the gold laid on the wet part till it be completely covered, or become toodry to take any more gold, and so on till all the work be covered with the gold that is wanted. Some wet the work with whiskey, but water is about as good. Then the interior, or hollow parts should be matted with ochre or Dutch pink and red lead. Isinglass size will answer well for mixing the colors for matting, or the white of eggs. After the work is perfectly dry it can be burnished with an agate burnisher, or a flint one. But the work must be perfectly dry or it will be spoiled by burnishing.
sapanner's gilding.
This gilding is performed by means of gold powder, or imitations of it
Compound gold size is made thus: Gum anima and asphaltum each one ounce, red lead, litharge of gold and umber each one ounce and a half. Reduce the grosser ingredients to fine powder and having mixed them, put them together with a pound of linseed oil into a proper vessel and boil gently with constant stirring by a glass rod till the whole is well incorporated. Continue the boiling and stirring until on taking out a small quantity it appears like tar as it grows cold. Then strain the mixture through flannel and keep it carefully stopped up in bottle having a wide mouth for use. When it is wanted it must be ground with as much vermillion as will make it an opaque body and also as much turpentine as to make it of a proper thickness for working with the pencil. Another plan and perhaps better, is to take of linseed oil one pound and of gum anima four onnces. Set the oil to boil in a proper vessel and add the gum anima in powder gradually, stirring till the whole is well mixed. Let the whole boil and treat as in the receipt before this, with the liharge, \&c. but when applied it must be mixed with vermillion and oil of turpentine as before directed. This gold size may be used on metals, wood or any other ground whatever. True gold powder is made as follows: Take ny quantity of leaf gold and grind it with irgin honey on a stone till the texture of the eaves be perfectly broken and their parts divided in the minutest degree. Then take the mixture of gold and honey from off the stone and put it into a china mortar with water and stir it well about till the honey is melted and the gold freed from it. Let the basin or mor tar then stand at rest till the gold subsides, and when it is so pour off the water from it and add fresh quantities till the honey is entirely washed away, after which the gold may be put on paper and dried for use. A gold powder of a more intense yellow, brighter than this may be made by precipitating gold dissolved in aqua regia by means of copperas or ulphate of copper, which can be done by pouring the nitro muriate of gold in water and dropping a solution of copperas or muri ate of tin in it, when the gold will fall to the bottom, and then the clear should be poured off and the gold washed and dried on a piece ot glass. German gold, which is made from Dutch leaf, if varnished, will answer for common purposes. It is made in the same way as the first directed above
Aurium Mosaicum, which is tin colored and rendered of a flaky, or pulverine texture, greatly resembles gold powder, and is much used in gilding. Take of tin 1 pound, of flow er of sulphur 7 ounces, of sal ammoniac and quicksilver each half a pound. Melt the tin and add the quicksilver to it in that state and when the mixture has become cold powder and grind it with the sal ammonia and sul phur till the whole be thoroughly mixed. Calcine them in a mattress, and the other inredients subliming, the tin will be converted into the Auriam Mosaicun and will be found at the bottom of the glass like a mass of flaky gold powder, but if any dark marks appear in it they must be carefully picked out or cut out. The sal a mmonia ought to be perfectly white and the quicksilver must be pure. The calcination may be best performed in a coated glass vessel hung in the naked fire and the body be of a long figure that the other ingredients may rise so as to leave the colored tin clear of them. The quicksilver although it be formed into cinnabar along with the sulphur need not be wasted. It can again be revived by distilling it with quick lime.

Lead may be detected in quicksilver if adul teration is suspected, by putting a small quan tity in a crucible on the fire when the silve will all sublime away and leave the lead be hind.
The gilding with japanner's gold may b used on any substance, and there is no othe preparation necessary to its being gilt than by just having the surface clean
The manner of using japanner's size is this Put a small quantity prepared as above direc ted and mixed with a due proportion of oil o turpentine and vermillion and put them int the vessel used for colors tor painting in va nish. Then either spread it over the wor with a brush, where the whole surface is to be gilt, or draw with it by means of a penci the proper figure desired and let it touch no other part. Then let it rest till it be fit for the gold, which will be known by it being a little clammy and not fluidous. When it is thus dry, the gold powders are used by a piec of wash leather wrapt round the forefinger and dipped in the powder and rubbed lightly over the sized work, or what is better, the powder may be spread by a soft camel hair pencil. The whole being covered it must be left to dry and the loose powder cleared awa and collected with the soft brush. When lea gold is used, the method of sizing must be the same as for the powders, but the point of due dryness is very nice in such a case for the leaves must be laid on while the matier is in a positively correct state, or the whole must be sized and giltover again. When more gold is mixed with the turpentine than is wanted, i can be immersed under water until it is again wanted, which is a good plan to preserve all kinds of paint or other composition that contains olly substances.


This is an arrangement whereby the perpendicular rod will be alternately traversed by the horizontal motion of the zig zag slot of the arm in which the pin is placed, conse quently the traverse will assume nearly a per pendicular direction. The working of rods in slots used to be very common in nearly all machines, but as far as possible, it is best not to use them as the friction is very great


The Windmill is familiar to every one.It is of most use in level countries where there are no mountain streams to propel water wheels. For this reason Holland has always been most distinguished for her windmills. At present she employs an immense number continually to pump the water out of her voes. Stevinus, a Dutch engineer, was the first who made carriages to travel on the oads by wind. He was a very scientific and skilful man. He lived in the 16th century. The windmill houses are generally circular.The shaft is attached to five frames with vanes or sails on them. The surface of the sails are not perpendicular to the axis, but inclined at an angle generally of 72 degrees at the end next to the axle, and at 83 degrees at the end farthest from it. Suppose the axle or main shaft to be placed in the direction of the wind -the wind will then strike the sails obliquely and the force will be resolved into two parts, one of which acting in the direction perpendicular to the action, gives a motion to
the rotation of the sails and consequently to the wind shaft, from which it is cummunicated to the machine. The era of the invention of windmills is buried up in the ages of antiquity, and they are old and familiar to us. We can scarce reconcile ourselves to an old rura andscape, unless the old windmill crowns the brow of some grassy hill.

Substitute for Chioroform
Professor Hieberg of Christiana, Sweden, has employed the sulphate of carbon as a sub stitute for chloroform. This gas is prepared by causing the vapor of fused sulphur to pass through charcoal powder heated to redness in an iron tube. When chloroform was first in roduced in this country, we exhorted tiousness in its use. We should not like to apply either ether, chlorof orm or bisulphate of carbon to a person of $a$ short, thick neck -it would be dangerous.

## Heat of the Burning Glass.

Convex lenses and concave mirrors, are frequently used for the production of high temperatures, by converging the rays of the sun, and those for this purpose are called bur ning glasses. At the focal point, any small object being exposed, its temperature is in stantly raised. Few substances can withstand the heat-brick, slate, and other earthy mat ers instantly boil, metals melt, and even vol atise away. Gold and silver melted in this manner throws off a vapor by which othe metals may be gilded. The heat attained by he burning glass, far exceeds that of the best constructed furnace.

## Nchoes.

Echoes are produced by the reflexion of sounds. The distance which a person should be from a perpendicular wall or building in order to produce an echo with the voice, is about $62 \frac{1}{\frac{1}{2}}$ feet. If there are a number of pex pendicular objects, at the suitable distance, the sound will be repeated many times. Near Milan there is a remarkable echo which re peats a sound thirty times, and at Port Kent, on Lake Champlain, there is also a nostbeau tiful echo

Speaking Trumpets.
The efficiency of the speaking trumpet de pends on its length. It is stated that through such an instrument 18 to 24 feet long, a man's voice may be heard at the distance of three miles.


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