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RAIL-ROAD NEWS.

Railroads in Texas.

We hope Texas will go ahead in the rail-road line at the earliest date. It is a country well adapted for railroads, and they are the very means required for developing its resources, and giving an impulse to industrial emigration. We believe that three railroads are now projected, two of which have been surveyed, and companies formed for their prosecution. The first is the Buffalo Bayou, Brazos, and Colorado Railroad; this railroad is intended to unite the navigable heads of the Brazos, Colorado, and Red rivers with the waters of Galveston Bay, at Harrisburg. There are fifteen miles graded, and in a few months the whole will be ready to the Brazos to lay the rails to connect with that river. This project is the first step for a railroad from the Gulf of Mexico to the Pacific.

The second route is the San Antonio and Gulf Railroad, to connect Harrisburg and South-western Texas with the waters of Matagorda Bay, and of course the Gulf at Indianolo.

The third route traverses the above two from east to west, and cutting across the heart of Texas, at the head of navigation on all her chief rivers, is intended to join the New Orleans and Opelousas Railroad, which, it is declared, when fully completed, will carry the best trade of Texas to the "Crescent City."

A Stately Bridge.

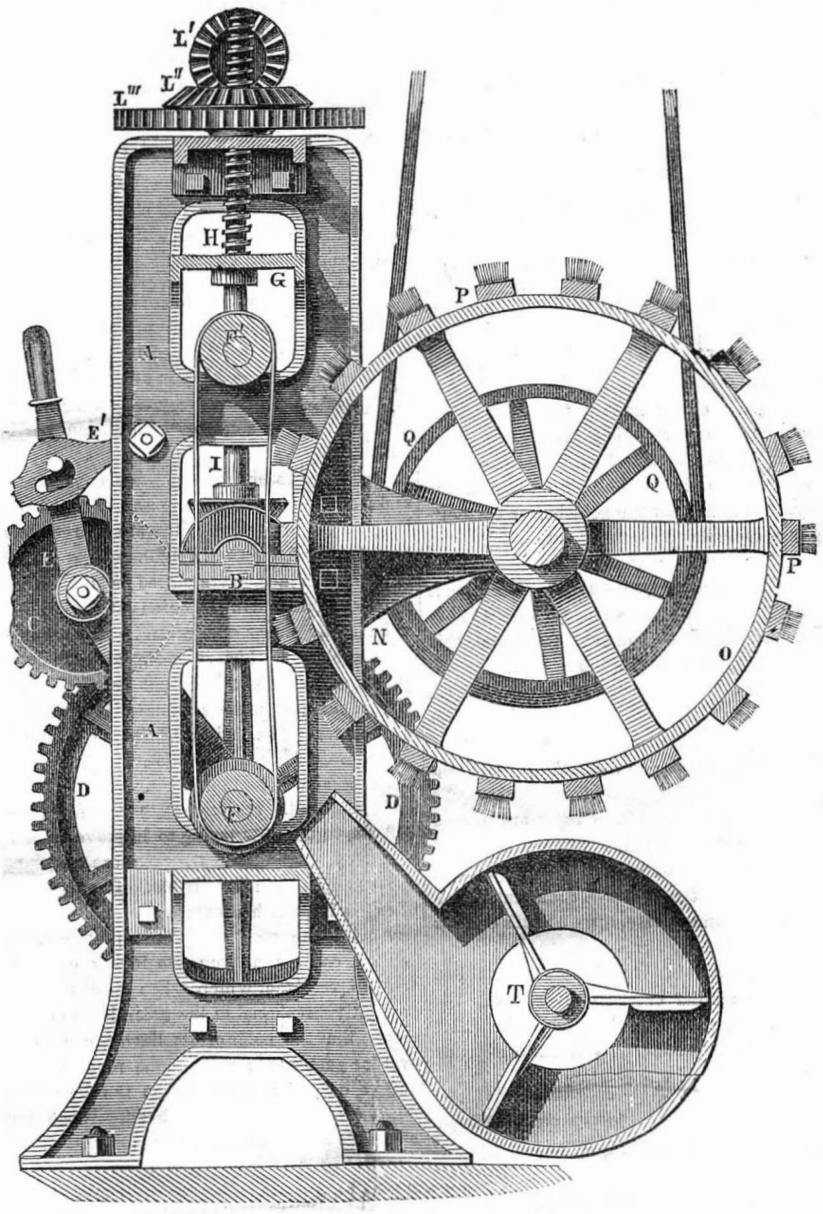
The New York and Buffalo Railroad, connecting Buffalo with the Erie Railroad at Hornellsville, via Warsaw, and Portage Falls, is now completed, and running, except the bridge over the Genesee at Portage Falls, which is to be completed on or about the 20th inst.

Of this bridge the Wyoming County Mirror, says:—

This immense structure is nearly completed. Those who have not seen it should go now, as it is worth fifty miles travel to see them raising it. It will be, if not the wonder of the world, the wonder of the thousands who will visit it annually. We are not aware that there is another bridge in the world as high and as large as this, and are confident there is not, of similar structure. It is 235 feet from the river to the track, and 240 to the top of the railing; and the length is 1,000 feet. The Suspension Bridge at Niagara Falls is 230 feet high and 795 long—so that Niagara is beat in this respect. And yet, though this work is reared to such an astonishing height it has the appearance of perfect safety. We are told, that by calculation they know that it would bear twenty times the weight of any train that can be put upon it. We think we should not fear in the least to ride over it the first time. We understand it is in contemplation to pass over it the first time with four of the heavy engines followed by a train of cars. If so, and the people have notice of the time, there will be thousands there to see it.

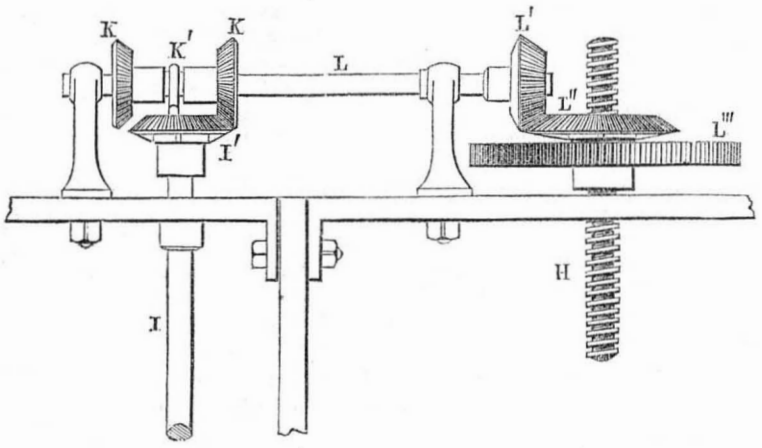
MACHINE FOR FINISHING YARNS AND THREADS.

Figure 1.



The annexed engravings are views of machinery for finishing cotton, silk, and worsted yarns and threads. The inventor and patentee is Godfrey Erman, of Manchester, Eng. Fig 1 is a sectional side elevation, and fig. 2 is a front elevation of the principal gearing for giving motion. In our country, the manufacture of cotton yarn in factories as an exclusive branch of business unconnected with weaving, is almost unknown. in England there are more than 30,000,000 lbs. exported every year. This yarn is dressed and put up in bundles for sale, and it is necessary, like the finishing of cloth, that it should look well. This machine is intended to clean, smooth, and separate the threads. It is an important machine, especially for cleaning and dressing colored yarn. There are some yarns colored with barwood, some with arsenic, potash, and the sulphate of the copper; they have all to be beaten and shaken when dry, to remove the offensive sediments of the dyestuffs out of them, and this has always been done by hand, the work is dangerously unhealthy, especially the dressing of the arsenic greens, and besides, it never has been thoroughly done by hand; this machine will accomplish the object.—The time will no doubt arrive in the course of our progress in textile manufactures, when much yarn, green, bleached, and colored, of silk, cotton, and wool, will be made in our country, and for factories and dyeworks this machine will form a landmark, to confer no small amount of benefit upon the manufacturers, and those who have been accustomed to finish yarns. The thread manufacture is but in its infancy among us; this machine is specially applicable to the dressing of threads in hanks like the strong linen kind, which we hope yet to see greatly improved, and rendered more perfect. There are a few factories in our country for making linen thread for shoemakers and saddlers, but there is only one factory in our whole country, with which we are acquainted, that makes linen thread for sewing; the samples of the thread which we have seen, of this home manufacture, lead us to say, that its makers have a great deal to learn yet.

Figure 2.



The threads are submitted to the operation of the machine while in the hank, and the object of the process is to impart to the threads a smoothness and evenness not hitherto attained by any of the ordinary means employed; and also to give them a greater degree of lustre or gloss than usual. The principle of the improvements is, to submit the threads to friction, produced by a revolving brush, the threads being maintained in a state of tension, and also in motion during the operation. A is one of two side standards, which being properly connected together by cross pieces, form the framing of the machine. B is the main driving-shaft, for giving motion to the machine; it is carried by two bearings, one of which is upon the side standard, and the other upon a bracket or carriage, fixed to, and projecting from, the standard; upon this driving-shaft is fixed the driving-pulley, and also a spur-pinion, which gears into the spur-wheel, C, upon the boss of which is fixed a spur-pinion, gearing into and driving the wheel D. The wheel, C, and its pinion revolve loosely upon a pin or stud projecting from the lever, E. The fulcrum of this lever is upon the shaft carrying the wheel, D. The upper end of the lever, E, carries a pin, which passes into a slot in the lever, E'; by means of this slotted lever, the lever E can be caused to assume one of two positions, nearer to or further from, the driving-shaft, so as to put the wheel, C, into gear with the pinion upon the driving-shaft, B, or remove it from gear with it, and thereby stop its movements; but at the same time the pinion upon the boss of the wheel, C, is never removed from gear with the wheel, D. The shaft carrying the wheel, D, is mounted in manner similar to that of the driving-shaft, B, that is, the bearings of it are in the side standard and in the bracket or carriage. The inner end of this shaft carries upon it one-half of a toothed clutch-box, the other half being upon the end of the roller, F. This is one of the thread-rollers; the other is at F'; and it is around and between these two rollers that the hanks of thread are placed in the machine; and the bearings upon which these rollers revolve, are of such a construction as to be removed from, and replaced in, the machine with facility, the clutch being the means of connection between the roller, E, and the shaft carrying the wheel, D, so as to communicate motion to it. The upper thread-roller, F', revolves loosely in its bearings; thus it will be seen that when the thread-rollers, F, F', are mounted in the machine, and the lever, E, fixed in such a position as to throw the wheel, C, into gear with the pinion upon the driving-shaft, movement will be given to the rollers, and consequently to the threads upon them, submitting fresh portions of them to the action of the revolving brush. During the operation, the hanks of threads are maintained in a proper state of tension, as follows:—The bearings in which the upper thread-roller, F', revolves are attached to the sliding-bar or frame, G. This is attached to the ends of two screws, H, passing through nuts above, by the

turning of which in either direction, the screws, and consequently the frame, G, will be elevated or depressed, and the hanks of threads upon the rollers tightened or slackened accordingly. The screws are worked by gearing as follows:—Upon the driving-shaft, B, is fixed a bevel-wheel, gearing into and giving motion to another bevel-wheel upon an upright shaft, I. Upon the upper end of the upright shaft, I, a bevel-wheel I′ is fixed; K K are two bevel-wheels fixed upon one boss, or a short hollow shaft working upon the shaft, L, which boss is attached to the shaft by a feather, which admits of the two bevelled wheels being moved lengthwise upon the shaft, so as to bring either of them into gear with the bevel-wheel, I′, or to throw them both out of gear with the wheel, I′, at one time. This is to allow the shaft, L, to be turned in either direction, so as to elevate or depress the screws as desired, or to allow the shaft, L, and consequently the screws, to be stationary. Upon the other end of the shaft, L, is fixed another bevel-wheel, L′, gearing into the horizontal bevel-wheel, L″, to the boss of which is fixed to the spur-wheel, L‴. The boss also forms the nut of the screw, H, by which it is elevated and depressed. The other screw is likewise provided with a similar nut and spur wheel, with a connecting pinion between moving upon a fixed stud; the intervention of the pinion being for the purpose of moving both nuts in the same direction simultaneously. The boss carrying the two bevel-wheels, K K, is provided with a small lever, K′, by which it may be readily moved along the shaft, L, when desired. Upon brackets, N, fixed to and projecting from the standards, A, is mounted the driving-shaft of the revolving-brushes, which consists of two end-wheels or centres, O, upon the periphery of which are fixed the bars, P, carrying the brushes. Upon one end of the shaft outside the carrying bracket is fixed the driving band-pulley, Q, this is driven by a separate band from that which gives motion to the main driving-shaft, B, whereby the movement of the brush is much more rapid than that of the threads under operation, and the movement of the threads may, when desired, be entirely suspended, as before described, while that of the brushes continues. At the lower part of the machine is mounted a fan blower, T, for the purpose of throwing a current of hot or cold air upon the threads under operation. The construction of this blower is of the usual kind, and motion is given to the fans either from the main driving-shaft, B, or from the brush shaft as most convenient.

When a number of hanks of thread are to be submitted to the action of this machine, the two rollers, F F′, are removed from the machine, and mounted in what may be termed a filling frame. The hanks of thread are then passed over the two rollers, and equally distributed on their surfaces. The rollers being placed in their respective bearings in the above machine, the driving-shaft, B, put in motion, and the spur-wheel, C, thrown out of gear with its driving pinion, so as not to give any movement to the rollers, F F′, that one of the bevel-wheels, K, upon the shaft, L, which will elevate the screws, H, is thrown into gear with the bevel-wheel, I′, so as to turn the nuts and elevate the screws and the upper thread-roller, F, until the threads have attained their proper state of tension. The further upward movement of the screws is then suspended, and the spur-wheel, C, thrown into gear with its driving-pinion upon the driving shaft, B, giving a slow progressive movement to the threads around the two rollers, F F′. The strap driving the revolving brush shaft is now thrown into gear, thereby giving motion to the brushes, which passing rapidly through between the threads, lay the fibres of them, and impart a great degree of smoothness and evenness to the threads, and a lustre and gloss not hitherto attained. When the tension of the threads becomes relaxed during the operation, as they will, the screws are again elevated, and the proper state of tension restored. When the threads are sufficiently finished, the machine is stopped, the rollers, F F′, are removed, the hanks of finished threads taken off, and others to be operated upon supplied, and the rollers remounted in the machine as before.

Gold Beating.

For making gold foil 2¼ oz. of gold dust mixed with 2¼ dwts. of silver and copper are fused together to form *deep* gold. The fused metal is cast in an ingot mould of 1½ inches long by 3-4 inch wide and 3-16 inch deep. The ingot is flattened into a riband 1¼ inches wide, 6 yards long, and about the thickness of foolscap paper. This having been annealed is marked out by compasses into 160 parts, which are cut out by shears into sections 1¼ inches square, each weighing between 6 and 7 grains. These 160 piece are beaten into leaves 4 inches square which are cut again into 640 pieces; in this state the leaf is named "Dentist's gold."

Gold may be extended into leaves which do not exceed 1-290000th of an inch in thickness. The proof of this remarkable tenuity is easy. For example, an ounce of gold is equal in bulk to a cube each of whose edges measures 5 12ths of an inch, so that, placed upon the table, it would cover little more than 1-6th of a square inch of its surface, and stand five-fifths of an inch in height. The gold beater hammers out this cube of gold until it covers 146 square feet. Now it can easily be calculated that to be thus extended from a surface of five-twelfths of an inch square to one of 146 square feet, its thickness must be reduced from five-twelfths of an inch to the 290,636th part of an inch.

The gold employed by the gold-beater should be pure; but various colors are obtained by alloys with silver, or with copper, in different proportions. The pure gold, or the alloy, is prepared for the gold-beater by melting in a crucible and casting into flat oblong ingots, each about three-fourths of an inch wide, and weighing two ounces. Each ingot is then formed into a riband by passing it between two rollers of polished steel, and this laminating process is continued until the ingot is spread out to a surface of 960 square inches of the thickness of rather more than one-eight hundreth of an inch.

The riband of gold is annealed or softened in the fire, and cut up into pieces of the size of a square inch, and 150 of these are placed by means of wooden pliers between an equal number of leaves of vellum, each square of gold occupying the centre of each leaf of vellum. A parchment case, open at both ends, is drawn over this tool, or kutch, as the packet of vellum leaves is called, and this is enclosed in a second similar case, so as to cover the edges left exposed by the first case. This packet is then beaten with a sixteen-pound hammer upon a smooth block of marble, strongly supported from below, and surrounded on three sides by a raised ledge of oak; the front edge is open, and has a kind of leathern apron attached to it for catching fragments of gold that may escape in the subsequent operations. The elasticity of the packet causes the hammer to rebound, and thus lightens the labor of the operator, and enables him to apply the blows with regular effect; every now and then, during the interval between two blows, he turns the packet over to distribute the force equally, and he occasionally bends the packet to and fro to overcome any slight adhesion between the gold and the vellum; and at intervals he opens the packet to see that the work is satisfactory, and also to re-arrange the relative positions of the squares of gold, by placing those near the surface in the centre, and placing those in the centre near the surface. The beating is continued until the one-inch squares are spread out into four-inch squares. The packet is then opened, and each piece of gold is taken out, placed on a cushion, and cut into four pieces with a knife. This increases the 150 pieces to 600, and these are put between the leaves of another tool, called a shoder, made of gold-beater's skin. The packet is enclosed in parchment, and beaten with a twelve-pound hammer as before. The squares of gold are again spread out to nearly the area of the gold-beater's skin. The packet is again opened, the leaves of gold are again cut into fours, and each quarter is placed between two leaves of membrane as before. The gold is in this case divided by means of the smooth edge of a strip of cane, since it has a tendency to adhere to a steel knife. The squares of gold, now increased to 2400, are separated into three parcels of 800 each; the squares of each parcel are again separated by gold-beater's skin, confined in the parchment cases, and beaten as before. These squares of gold-leaf expand for the third time nearly to the size of the leaves of membranes, and have at length attained the required degree of tenuity. The process of attenuation can be carried beyond this, but the gold is apt to tear, and the process requires great extra care. The three beatings and two quarterings expand the gold to an area about 190 times greater than it had in the form of a riband, and 100 square feet of it weigh only an ounce.

After the last beating, the thin leaves are taken up one at a time by means of a pair of long pincers made of white wood, and being placed on a cushion, are blown out flat by the mouth, an operation requiring considerable skill. Broken or injured leaves are rejected; but those which are perfect have the ragged edges cut off, which reduces their dimensions to about 3¼ inches square. Twenty-five of these leaves are placed between the folds of a paper book, the surfaces of which have been rubbed with read chalk, to prevent the gold from adhering, and in this form gold leaf is sold.

Gas for Flowers.

The Paris correspondent of the St. Louis Times says:—

"And now let me tell you of a most beautiful and interesting discovery which has lately been made by a celebrated Parisian horticulturist, by the name of Herbert. I was persuaded to go to his rooms a few days since, and I assure you I had no reason to regret the long walk I had taken. Beneath a large glass case, four or five feet in height, and as many in circumference, were placed pots of roses, japonicas, pinks, dahlias, china asters, &c., all in bud. By means of a certain gas, invented by himself, and which is made to pass by a gutta percha tube to any pot required, Mr. Herbert causes the instantaneous blooming of the flowers. The ladies in the room asked successively for roses, dahlias, and japonicas, and saw them burst into full bloom and beauty, in a second. It was really wonderful.—Mr. Herbert is now trying to improve on his discovery, and to make the gas more portable, and its application less visible. The secret is, of course his, and his rooms are crowded every day with the most delighted spectators. I wish I could send you the lovely camelia which I received, which, when asked for was so tightly enveloped in the green leaves of its calyx, that the color of its flower could not even be guessed at; and yet the request was hardly out of my lips when the beautiful white camelia was in my hand. When he has made a little more progress, Mr. Herbert intends to get out a patent and deliver his discovery to the public."

This gas was no doubt discovered among the giants of Brobdignag by the celebrated traveller Gulliver.

Chicory.

While in England, says a correspondent of the Journal of the New York State Agricultural Society, we received information as to the culture of this plant, the roots of which are used as a mixture with coffee. In many establishments of the first character in London, where coffee is extensively sold, we found the real coffee, prepared and ground, and by its side, chicory, prepared and ground; and were informed at several of these establishments that it was preferred to mix them, one-third of the chicory to two-thirds of the coffee. The flavor of the chicory is suited to the tastes of many, and its medicinal qualities give it great favor. Most of that in use in England is imported from Belgium and Germany; but it is being cultivated to a considerable extent in England and Ireland, and the cultivation is increasing.

The seed is drilled in, in April, the same as carrots or beets, on rich light land, and thinned in the rows to about six inches, and kept entirely free from weeds. In September, the roots should be gathered. They are taken up with a potato-fork, and the tops taken off, and the roots are taken to a convenient place and thoroughly washed. The roots are cut in small pieces, either by hand or a common turnip-cutter, having them as near a uniform size as practicable. The larger are then separated from the smaller, and put into coarse canvas bags and placed on a kiln to dry. They are then disposed of in market to the merchants, who prepare the root in the same manner as coffee, roasting and grinding. As soon as practicable after the roots are cut, they should be dried, to prevent the loss of the milky juice, which contains its most valuable properties. The leaves are fed to cattle and sheep, which are very fond of them; and they are also used as a substitute for woad for coloring, and are esteemed very valuable for that purpose.

A Second Sam Patch Leap.

A second Sam Patch leap came off on Monday, the 2nd inst, from the Suspension Bridge below the Falls, into the middle of Niagara River. Some five hundred persons were present to witness the feat. In consequence of the strong unexpected current of air under the bridge, the gentleman's back, instead of the pedal extremities, was first introduced to the surface of the water. He was not so badly injured, however, but that he commenced swimming towards the shore and was soon taken into a small boat. He had an appointment to descend the precipice at the Falls, in a similar manner, but the result of his experiments has determined him to look to some other opening for notority and fame.

Such feats appear to take their course like fashions One fellow has been amusing us New Yorkers for three weeks past, with jumping off the High Bridge into the Harlem River. It is a profitless and dangerous feat. Sam Patch lost his life at last, and Scott, the celebrated American leaper turned crazy and put an end to his life on London Bridge.

Barnum's Opinion about Advertising.

The following extract is taken from Freedley's Practical Treatise on Business; it is from the pen of the celebrated P. T. Barnum:

Advertise your business. Do not hide your light under a bushel.—Whatever your occupation or calling may be, if it needs support from the public, advertise it thoroughly and efficiently, in some shape or other, that will arrest public attention. I freely confess that what success I have had in life may fairly be attributed more to the public press than to nearly all other causes combined. There may possibly be occupations that do not require advertising, but I cannot well conceive what they are. Men in business will sometimes tell you that they have tried advertising, and that it did not pay. This is only when advertising is done sparingly and grudgingly. Homœpathic doses of advertising will not pay perhaps—it is like half a potion of physic—making the patient sick, but effecting nothing. Administer liberally, and the cure will be sure and permanent. Some say "they can not afford to advertise;" they mistake—they cannot afford not to advertise. In this country, where everybody reads the newspapers, the man must have a thick skull who does not see that these are the cheapest and best medium throughout which he can speak to the public, where he is to find his customers. Put on the appearance of busines, and generally the reality will follow. The farmer plants his seed, and while he is sleeping his corn and potatoes are growing. So with advertising. While you are sleeping or eating, or conversing with one set of customers, your advertisement is being read by hundreds and thousands of persons who never saw you, nor heard of your business, and never would, had it not been for your advertisement appearing in the newspapers.

The Koh-i-noor.

Diamond cutters have been brought from Amsterdam to London, to cut the great Koh-i-noor diamond into an oval brilliant, increasing its value and brilliancy.

A machine has been erected in London for the purpose, and the greatest anxiety has been manifested for the success of the undertaking.

Extraordinary Phenomenon.

Recently during a thunder storm, at Kingston, Canada, the lightning struck the bridge leading from the town to Point Frederick, pierced a large hole in the floor, and threw down one of the stone piers. A soldier, crossing at the time, had his clothes torn by the lightning, and the metallic ornament on his cap melted, but escaped himself without any serious injury.

For the Scientific American.

Aurora Borealis.

The Aurora Borealis, or Northern Lights, have ever excited the speculation of philosophic minds; yet the wisest philosophers have been unable to explain its wonderful display, and bring it within the range of philosophic law. We find in our atmosphere a strong under-current of cold air moving towards the equator; so strong indeed, as to form a stiff breeze, called trade wind; and necessarily there must be a corresponding upper current moving towards the poles. This upper current, when it leaves the torrid zone, is highly rarefied, and does not meet with any very rapid condensation, until it arrives within the influence of the eternal frosts of the poles, or as high latitudes as 70°. Near this latitude the magnetic poles have been fixed; and around the earth, following this line of latitude, is frequently seen in the heavens a brilliant band of light, from which flashes up beams and floods of light, forming the beautiful and frequently brilliant display termed Northern Lights. This light is electrical light, produced by the evolution of electricity consequent on the sudden condensation of the atmosphere. The beams of light which spring up through the sky, are currents of air highly charged with moisture, which, on coming within striking distance of the electrical band, are suddenly electrified.

It has been discovered by observation that in certain latitudes a storm generally succeeds a brilliant display of Northern Lights. This is owing to the check given to the advancing current by the opposing force of electricity, which condenses it; and consequently it falls to the earth. G. H. W.

Nelson, Madison Co., N. Y.

[For the Scientific American.]

The Steamer Henry Clay.

The sad catastrophe to this steamer, which has been announced, leads us to reflect on the causes which led to the great sacrifice of human life here. From the accounts received through the papers, the ostensible cause originated in the excess of heat generated, by which the wood-work of the vessel was set on fire, being, no doubt, ~~in an excessively dry state~~ easily inflamed. A steamer constantly in action, must be in a state of extreme danger from this cause, and the surprise may be, that such accidents do not more frequently occur. This calamity is a sad warning to us, to guard against its recurrence. The present system upon which steamers are built, subjects them to accidents of this kind almost constantly, and no effectual plan has been yet devised to remedy the evil. That a remedy exists there can be no doubt, and as it is essential that such remedy should be at hand, I would here present the means by which this remedy may be applied, for the consideration of steamboat engine builders. The base of this means is the application of the motive power itself to remedy the evil. The intervention of steam, between a burning body, or flame, and a body subject to be set on fire from the too near approximation to the burning body, will effectually guard the latter from conflagration, or attaining a degree of heat which would induce it to take fire. This conservative action of steam is well known, and I took occasion some short time since to point out its application in extinguishing fires, by guarding the houses surrounding the fire by throwing on the surface exposed to the fire, only so much water as will be converted into steam by the heat of the adjacent fire. This fact being established, (a very important one), the application of the same means,—namely, steam—thrown and kept between the fire and the wood-work of the vessel, will effect the object of securing the vessel from taking fire, however hot the furnace should be. I shall not enter here into the philosophy of the principle. Facts are of more importance than theory, and we have many of the former to prove the truth of the proposition. It is upon this principle that individuals have exposed their persons to the violent heat of ovens, that would cook an egg with impunity. The excessive perspiration induced from their bodies kept the heat from acting on them. It is thus that the fire-eaters (as they are called), are able to lay a red hot iron on their tongue, without injury to themselves, because a body of steam is generated between the surface of the tongue and the red-hot iron, that prevents the tongue from suffering, or being burnt: the fire-eater would not dare to put the red-hot iron on his tongue when in a dry state. Why do the operators in furnaces, where they are subject to violent heat, wet themselves and moisten their lips, when they are ladling up the red-hot metal? The answer to this is evident from what has been already advanced. These facts will suffice to prove the efficiency of the plan to cut off the heating process between the furnace of the steamer and the wood of the vessel. The whole of the heating apparatus aboard the steamers should be cut off from the hulk by a body of steam filling the cavity made here, which will guard the vessel from the danger of fire. I have voyaged in many steamers, and have found them all more or less greatly heated near the furnaces, and though this may not be dangerous in short trips, as the heat soon ceases, yet where the voyage is long the danger is increased in proportion. It is time for us to look into this matter, and if there be danger, which has been manifested in the fate of the Henry Clay, we should not lose a moment to rectify the evil. The problem of adapting the means suggested, to the particular condition of this department in the steamer, belongs to the Engineer of the Machinery, and with him I leave the subject for consideration and action. The community will not be satisfied without a guard is set securely against a recurrence of the distressing catastrophe of the Henry Clay.

Robt. Mills, Engineer and Architect.

Washington, D C.

Brick Making.

Since my communication of the 6th March (No. 25) I have been engaged in perfecting the brick machine there mentioned; during the progress of which many unforeseen difficulties were encountered and many disappointments incurred where success seemed certain. Perseverance, however, has overcome them all and I have now the satisfaction of seeing my anticipations realized.

It will be remembered that I set out with the intention of taking the clay direct from the bank, temper and mould it as stiff as potter's clay, so that the bricks might be borne off to the floor and set on edge to dry. The first part of the operation was successful from the start, and for this I am indebted to my former dry clay machine, for the secret lies in first reducing the clay to dust before it is mixed with the water, when the two combine instantaneously. The operation of the knives then mix and temper it so thoroughly that in less than five minutes it is reduced to a consistence which no amount of labor can excel. Not a particle of raw matter can be discovered, even the size of a bean. This must render the machine of peculiar advantage at the South, where they have not the benefit of the great disintegrator—frost. There this part of the process is the most laborious. I am told that it requires the work of twelve oxen, travelling half a day in a clay pit, to mix enough for 8000 bricks. By this machine the tempering and moulding is all done at once, and never more than a cart load under operation at the same time.

To fill the moulds with clay as stiff as I proposed, was the first difficulty encountered, and here many thought that I should fail. It is indeed astonishing how much this increases the resistance compared with the soft mud as usually worked, and what power is necessary to overcome it. After numberless experiments, which it would be tedious to recount; the section of a screw applied in a peculiar way accomplished the object, and since it was adopted not a single failure has occurred.

But then the communication between the sixteen moulds first filled, and the body of clay in the box, must be broken as the train passes along the railway; and this presented a far greater resistance than I had anticipated. After repeated trials and many disappointments, a combination of gearing secured this also, and finally, having perfected some minor details, chiefly in the mode of management, the machine has been put in full operation to the satisfaction of all who have witnessed it.

I send you specimens of the burned and unburned, and call your attention particularly to the solidity and closeness of the texture, not unlike stone, as an evidence of the great pressure under which the clay is thrown together.

The steam machine, driven by a six-horse engine, works six moulds in a frame-maker three and a half revolutions per minute, giving 1260 bricks per hour. The work is all done by common laborers, chiefly boys. Supposing the clay dropped at the machine, it requires one man at the pulverizer, three boys to dust the mould and return them to the machine, two boys to off-bear, and three boys to wheel the cars to the yard and set the bricks in the sun. Each car carries forty bricks: cost of the machine, including patent right, $500.

The smaller machine is moved by one horse attached to a twelve-foot lever; it makes three revolutions per minute, throwing out four bricks each time, giving 720 per hour. In this the pulverizer is omitted, as it would render it too complicated. For this purpose the clay must be thrown into a heap and well saturated with water twelve hours previous; the machine does the rest. I can see no difference in the quality of the brick made by either: cost, including right, $250.

To make "gluts" for fronts, a separate train of mould must be prepared, made a fourth of an inch deeper, and a fraction less in width and length. If a suitable shed or other building is prepared for the purpose, all this part of the operaaion may be done in rainy weather, and thus afford constant employment to the hands. Twenty-four hours after being moulded, the "gluts" are ready for the hand press

I have in contemplation another improvement, which, as it is not yet fully proved, I will merely mention. The present speed is all that can be allowed to enable the boys in front to work the pistons and pass off the bricks; when made of stiff clay they are square and true—very nearly if not quite equal to the common latch mould front. But when quantity, instead of quality is desired, I propose to have an extra train of moulds with fixed bottoms: to work the clay soft, as in other brick machines—pass the moulds immediately off to the drying floor, and throw them down flat. They will of course be no better than other moulded bricks except as to the clay being better tempered, but as there are no pistons to work, and no interruption in front, the speed may be double, and consequently the quantity of bricks increased in like proportion. Francis H. Smith.

Baltimore, August 12, 1852.

We have seen specimens of the bricks referred to above; they are of a very superior quality. In the course of a few weeks, we shall publish an engraving of the machine.

Elementary Mechanics.

Strength and Strain of Materials.—The materials employed in machinery are subjected to four different kinds of stress or strain, by which the force of cohesion may be ultimately overcome, and fracture ensue.—These are, 1. Tenison, or any stretching force, by which they may be torn asunder, as in the case of ropes, tie-beams, king-posts, &c. 2 Transverse Pressure, or any breaking force acting perpendicularly or obliquely to the direction of their length, as in the case of levers, joists, &c. 3. Vertical Pressure, or any crushing force acting in the direction of their length; as in the case of pillars, posts, &c. 4. Torsion, or any twisting force acting at either or both extremities of a beam or rod, such as the axle of a wheel, a screw, &c.

The natural forces, inherent in materials, which oppose the preceding forces, are, Direct Cohesion and Elasticity. Numerous experiments have been made on the direct cohesion of different substances, particularly woods and metals—on their resistance to transverse pressure, and their amount of deflection under a given pressure—on the *modulus* or measure of their elasticity—and lastly, though neither to so great nor so satisfactory an extent, on their resistance to vertical pressure or crushing weight.

The following table contains the mean strength and elasticity of various materials, as deduced from the most accurate experiments; it is the latest that has been published, and it was presented by Mr. Barlow, to "the British Association for the Advancement of Science."

The first column of figures, marked C, contains the mean strength of cohesion on an inch section of the material; the second, marked S, the constant for traverse strains; the third, marked E, the constant for deflections; and the fourth, marked M, the modulus of elasticity.

Materials.	C	S	E	M
Woods	lbs.			
Acacia,		1800	4609000	3739000
Ash,	17000	2026	6580000	4988000
Beech,	11500	1560	5417000	4457000
Birch, common		1900	6570000	5406000
Birch, American blk.		1500	5700000	3388000
Box,	20000			
Bullet-tree,		2650	10512000	5878000
Cabacully,		2500	7437000	4759000
Deal, Christiana,	11000	1550	6350000	5378000
Deal, Memel,	11000	1730	6420000	6268000
Elm,	5780	1030	2303000	3007000
Fir, New England,	12000	1190	5967000	6249000
Fir, Riga,	12600	1130	5314000	4080000
Fir, Mar Forest,	12000	1100	3400000	2797000
Green heart,		2700	10620000	6118000
Larch, Scotch,	7000	1120	4200000	4480000
Locust tree,	20580	3400	767000	4649000
Mahogany,	8000			
Norway spars,	12000	1470	5830000	5789000
Oak, English	from 9000 to 15000	1200 2260	3490000 7000000	2872000 47020000
Oak, African,	14400	2000	9500000	55830000
Oak, Adriatic,	14090	1380	3880000	2257000
Oak, Canadian,	12000	1760	8950000	5674000
Oak, Dantzic	14500	1450	4760000	3607000
Pear-tree,	9800			
Poon,	14000	2200	6760000	6488000
Pine, Pitch,	10500	1630	5000000	4364000
Pine, Red,	10000	1340	7360000	6423000
Teak,	15000	2460	9660000	7417000
Tonquin bean,		2700	10620000	5826000
Iron.				
Iron, cast,	from 16300 to 36000	8100	69120000	5530000
Iron, malleable,	60000	9000	91440000	6770000
Iron, Wire,	80000			

The use of this table will be exemplified in the following problems, for the demonstration of the principles of which, we must refer the reader to the scientific treasties on Natural Philosophy.

Force of Direct Cohesion, or Tenacity of Materials.—The resistance of a homogeneous body to longitudinal tension or a stretching force is proportional to the area of a transverse section; hence, the centre of tenacity is the same as the centre of gravity of the section. The absolute strength of rods or beams is estimated by the cohesive power of the material of which they are composed. The preceding table exhibits in column C, the force of direct cohesion in pounds avoirdupois for every square inch of area in the transverse section of a beam or rod of the materials enumerated in the first column.

To find the absolute strength or force of direct cohesion of beams or rods of given materials, that is, their absolute resistance to longitudinal tension or strain in pounds—

Rule—Multiply the area of the transverse section of ~~the rod or beam~~ in inches by the tubular number, in the column marked C, opposite the name of the material, and the product will be the strength or resistance required. Note 1.—In practice, the weight or strain should not exceed one-third of the absolute strength according to Barlow, or one-fourth according to Tredgold. Thus, the force which would tear asunder a piece of teak 4½ inches broad and 2 inches thick, is 2×4½×15000=135000 pounds. Hence a longitudinal strain of more than 45000 lbs. would be unsafe in practice. Note 2.—The tenacity of materials of the same kind is proportional to their specific gravity. Hence, a piece of teak, whose specific gravity was 1-20 part less than that of the preceding, would have 1-20 part less of cohesive power.

When the direction of the straining force does not coincide with the perpendicular to the centre of tenacity or centre of gravity of the transverse section, the Rule is modified as follows: Multiply the tabular number in column C, by the breadth and square of the thickness of the beam, both in inches, and divide the product by the sum of the thickness and 6 times the distance of the line of direction from the centre of the section, in inches; the quotient will be the absolute strength required, of which take one-third as before, for the practical load. Note.—In actual constructions, an allowance of one-third of the thickness should be made, for the probable deviation of the direction of the stretching force. The absolute strength will then be one-third of that found by the Rule in the preceding article; and the practical load 1-9 of the same quantity, or 1-12 according to Tredgold.

NEW INVENTIONS.

Sawing Felloes.

Asa George & Seth Stubbs, of Lincolnton, N. C., have taken measures to secure a patent for a useful improvement in a machine for sawing felloes and other articles forming parts of circles. The nature of the improvement consists in providing a revolving table on which the plank or stuff out of which the felloes are to be made is placed; this table is so arranged as to have different centres, either of which may be employed as desired, so that the felloes may be cut to form parts of circles of different diameters according to the centres on which the stuff is placed. The saw sash is of ordinary construction, and two saws are secured at one end of it, and made adjustable, so as to cut felloes of different widths. There is a stationary table adjoining to the movable one, on which the plank partially rests, while the saws are cutting to keep the stuff firm and steady under the saws.

Machine for Making Sheet Metal Tubes.

Orson W. Stow, of Southington, Hartford Co., Conn., has invented a new and useful improvement on machinery for forming sheet metal tubes, for candle moulds, dipper handles, lamp tubes, &c., and consists in a peculiar mode of operating a die rod which forces the sheet metal into a concave bed, and thus makes one half of the tube, and then in combination with this action there are folders attached to movable wings which have their axes of motion coinciding with a line passing longitudinally through the centre of the die rod spoken of, these folders, by properly bending the sheet of metal over the half of the die rod, form the other half of the tube. Measures have been taken to secure a patent.

New Machine for Splitting Leather.

Henry F. Patton, of Deansville, N. Y., has invented some improvements on machinery for splitting leather. The nature of the invention consists in the employment of a knife having a horizontal reciprocating motion imparted to it by a serpentine cam which is secured on the end of the feeding roller that is placed behind the knife, and which draws the hide through between the two gauging pressure rollers in front, against the edge of the knife. It is common to have but one gauge roller on leather splitting machines, this one has two, the extra one being placed above and entirely separate from the lower one; it is secured on a frame attached to springs, and acts as a pressure roller, thus enabling the knife to operate upon the leather in a very correct and superior manner. Measures have been taken to secure a patent.

Improvement in Pumps.

L. P., and W. F. Dodge, of Newburg, Orange Co., N. Y., has taken measures to secure a patent for an improvement in double-acting lift and force pumps. The improvement consists in connecting the valves of the two pistons by a tube encircling the rod, whereby their simultaneous operation is insured, one closing at the precise moment the other opens.

Improved Hinges for Blinds.

Messrs. W. French and W. C. Whipple, of New Haven, Conn., have invented an improvement in hinges for blinds, the nature of which consists in the employment of a latch arranged and attached to a hinge in a peculiar manner, by which the shutter or blind may be secured in an open position, without the necessity of using catches at the outer edges of the blinds, and hooks in the wall, as is now the case with common blinds. Measures have been taken to secure a patent.

New Rifle Pistol.

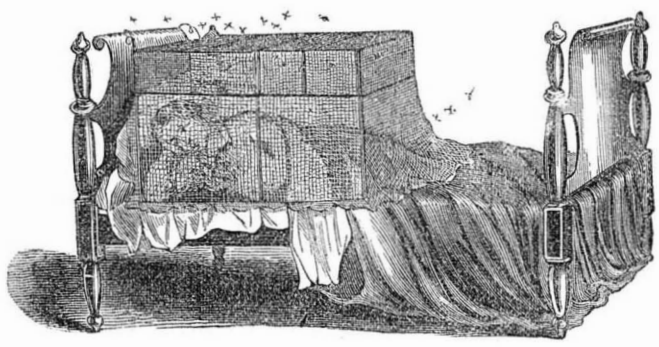
Mr. Marston, of New York city, the inventor of the breech-loading rifle, which receives its name from that of the inventor, has made some fine pistols on the same principle. They are better, we believe, than the revolvers, and should be introduced into the navy, and all our cavalry regiments.

Hydrochloric Acid.

Dr. Davis, of Syracuse, N. Y., states that he has employed hydrochloric acid with great success in dysentery. He employs one drachm of the acid of commerce diluted with half an ounce of water, and given in 20 drops in half a gill of sweetened water every sixth hour.

WILLARD'S MOSQUITO FRAME.

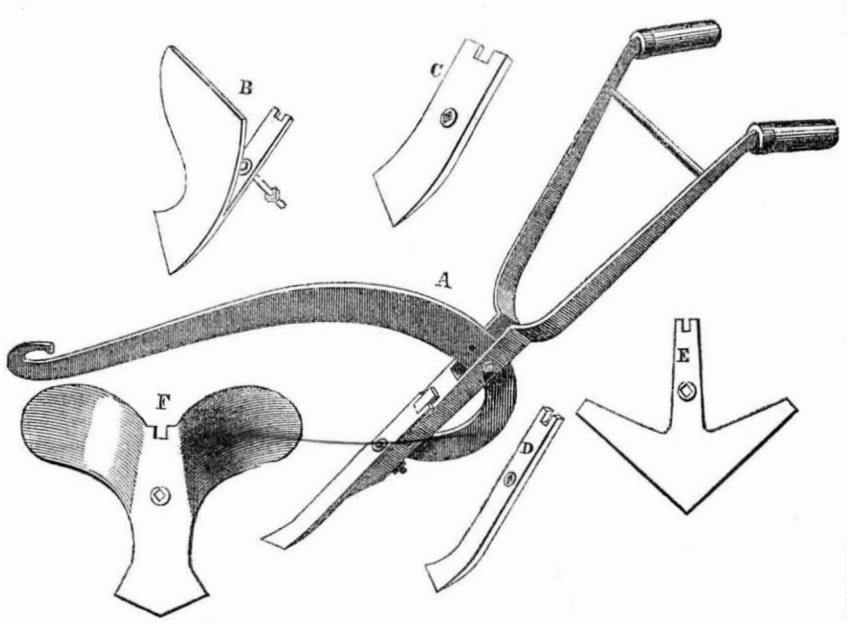
The accompanying engraving is a perspective view of a frame of a mosquito net for beds, invented by J. A. Willard, of Alton, Illinois, who has taken measures to secure a patent for it. The frame is made of wire, with joints, formed into small pannels; it can be folded up so as to be carried in a valise, and then be stretched out over the bed, and the net spread over it, as represented in the figure. The top is separate from the sides, and is composed of extension pieces of wire, which slide into one another (for beds of different widths) like the cases of a telescope. There is a wire clamp which fastens the frame to the head-board, and then it is expanded and the top cross-pieces inserted, after which the net is thrown over, when the mosquitoes may buzz and dance about as much as they please, for their own amusement or benefit, but they cannot raise a blister on the man who happily has provided himself with one of Willard's frames and nets, like the sensible gentleman represented in this engraving. One of these frames can be folded up, and will not occupy a space of more than twelve superficial inches. It is indeed very portable, and well adapted for per-



sons who are travelling. On the Sacramento river, in California, the mosquitoes are to be seen in clouds, and are the terror of travellers; one of these frames, with a net, weigh only a few ounces, and can be carried about whithersoever a person travels, so that if he has to sleep on the banks of the Sacramento, on the cold ground, he can easily stretch his frame, spread his net, and bid defiance to all the mosquitoes in California. A number of gentlemen in this city (New York) have seen these frames, and are about to furnish their dwellings with them. This city is not a little distinguished for its mosquitoes; cities further south are not able to surpass it, for the whole insect tribes from the swamps of Jersey and Long Island, have discovered that here they need not weary their wings in search of subjects, but at once, in the language of the immortal Campbell, "like reapers descend to the harvest of death."

These mosquito net frames are made by B. E. & Ira Buckman, Jr., model and pattern builders, No. 94 Fulton street, this city. Different sizes of frames can be seen at Messrs. Buckmans' factory, and all the requisite information given about every thing connected with it, both as it respects price and use.

FORMAN'S PATENT PLOW.



The accompanying engraving is a view of a wrought-iron plow invented and patented in February last by James H. Forman of Sharon, Chambers Co. Alabama. The letters refer to different parts of the plow. A is a plow stock with subsoil share attached; B is the turning share; C is a medium share; D is a subsoil share; E is a sweep or grass killer, and F is the opener. A plow for one horse weighs about from 30 to 35 lbs.; that for two horses weighs about 40 lbs. With the subsoil share attached, one horse, Mr. Forman informs us, will break stiff clay land eight inches deep; and by preceding it with the turning share, a depth of twelve inches may be obtained. The medium share with one horse, will break from four to five inches deep on one and a half acres in one day. With the turning share, one good horse will do more ridging and bedding, and do it better, on the land in Alabama, than two horses can do with the Eagle Plow. The sweep can be adjusted so as to run from one to two inches deep, thereby cutting up the roots of grass—killing it—and clearing away weeds around the roots of the growing crop; it effectually cleans a four foot row by three furrows. The opener, F, opens a very wide and deep furrow, and when the land has been previously broken, will do the work of two turning plows. By the adjusting pin, and the extra holes in the beam, the plow can be adjusted to any size of horse, or to dip to any required depth, even to the burying of half the beam. It requires no clevice, has but two bolts and one rivet. It is not subject to wear, as the share effectually shields the foot. This plow is very portable each one can be packed in a space which will not occupy more than a cubic foot, and all the parts can be put together, ready for work, in two minutes, and any good smith on a plantation can make it. This plow is well adapted for southern culture, and we have before us the certificates of six planters in Alabama, who are now using it, who say they believe it to be more durable, and better adapted to all required purposes generally, than any other plow with which they are acquainted.

More information may be obtained respecting it, by letter addressed to Mr. Forman, at Lafayette, Oak Bowery, or Sharon, Chambers Co., Ala.

New Electric Globes.

A new improvement is now in operation in Paris, which will consist of large globes of crystal placed on the top of every column now along the Boulevard, for public use. In the evening these globes will be illuminated with electric lights, and will produce an immense blaze over the public road. The experiment has already been made, and proved very successful. Our opinion about it is, that the light will be more brilliant than profitable, but Louis Napoleon le Grand can afford it.

Active Principles of the Scullcap.

The following is taken from the Eclectic Journal of Medicine:—

"Scuteline.—This is obtained from the blue, or as it is usually called bitter scullcap. There are several species of this plant, that are used as medicine; but the above is the only kind that contains any valuable medical properties.

It is a common practice when treating on the remedial agents, in the light of discoveries, to say, that 'this remedy is one of the best,' the 'most valuable,' and 'one of the greatest discoveries of the age,' etc. Now, it is possible, that I am as liable as any one, to run into this foolish and qaackish mode of expressions: yet expressions of this kind to the scientific and thinking mind, are disgustive and repulsive. The scuteline, is entitled to these eulogies, if any medicine, but it is sufficient to say of it, that it is a valuable medicine.

In its pure state, it is a white powder. The process of obtaining it is somewhat difficult, and too tedious to insert here.

Medical Properties and Uses.—It is indicated in the treatment of nervous diseases, especially those attended with debility, which have been induced by the use of tea, coffee, tobacco, alcoholic drinks, or any poison habitually taken into the human stomach. Who has not witnessed the dried and mummy-like appearance of the tea and coffee drinker?—How often do we see the emaciated, cadaverous-like palpitation, nervous irritability, all the result of the free use of the above articles. The true physician will never prescribe physic to cure bad habits; but this much he should do, teach his patients to avoid the exciting cause of his disease, and then with proper remedial agents, aid the recuperative powers of nature restoring a normal condition of the system. The scutelline being a nervine tonic, is peculiarly adapted to this end. It is also useful in the treatment of tetanus, convulsions, tremors and chorea. It is generally supposed that no method of treatment is successful in the cure of chorea; but in the incipient stages of this disease, the scutelline will be found a successful remedy. Dose, one to two grains, from two to six times a day.

Inflammation of the Bowels.

Dr. Hoyt, of Boston, instead of treating this disease in the old common mode, by blood letting, calomel and opium, &c., he lays down the following rules:

"Give the patient no medicine; nor food of any kind, but allow him to drink water moderately. He should be laid upon a bed and laid in a cold wet sheet, and cold water applied in the folds of a cloth on the abdomen. If the patient should get cold (which should not be permitted) the cold water application must be suspended, and the patient covered up with blankets kept up from the body by segments of hoops. When heat has accumulated to a higher than ordinary degree, the cold water must be resumed. Water applied internally and externally is the remedial agent depended on, and it is cold enough for this purpose at seventy degrees."

He says he has tested this method of treatment thoroughly and with success. It is a most dangerous disease.

Lozenge Tea.

At a late meeting of the Horticultural Society of Edinburgh, a paper was read by Dr. Murchison, on the essence of tea in lozenge form, used by the Chinese as a substitute for tea, when they wish to have the article in a a more condensed form. Some specimens were tested by the members present, and pronounced excellent. In the course of his remarks, Dr. M. showed that the amount of water in which the essence is diluted in the form of tea as usually drank, varies from 90 to 99 per cent. The lozenges will keep for many years without deterioration.

Scientific American

NEW-YORK, AUGUST 21, 1852.

Mechanics Fairs.---New York Crystal Palace.

Fairs, for the display of works of art and the products of industry, are of verv ancient origin, and have been the means of doing much good in every country in which they have been established and encouraged. Our country, although young, has been greatly benefitted by such exhibitions; they should be sustained with the heart's best enthusiasm of the nation. The objects of such exhibitions are to excite a spirit of laudible emulation, and to present objects of comparison for improvement. The man who exhibits a machine at a Fair, does so because he believes he has produced something which he is proud of displaying, and respecting which he has a consciousness that it possesses peculiar merit. Machines and implements of different kinds arranged together, enable those who are interested to make comparisons of their qualities, to detect defects, and thereby suggest improvements. That spirit, so pre-eminent in our people—the desire to excel—is thereby stimulated, and many men, observers at past Fairs, will be exhibitors at future ones; this is the way to improve and progress. Almost every (if not all) State in our Union has its State Agricultural Society, and the utmost latitude is allowed at the Fairs, for the display of useful machinery; this is right—we are glad that such a spirit is abroad in our land; it has done much for the advancement of Agricultural and Mechanical Art, and it will do much more.

The Annual Exhibition of the State Agricultural Society of New York, takes place at Utica on the 7th of next month (September). The Annual Fair of the State Agricultural Society of Pennsylvania takes place at Lancaster on the 21st of October next. The Fair of the Maryland Institute will take place in Baltimore on the 4th of the same month; and the 25th Annual Fair of the American Institute will be held at Castle Garden, this city, at the same time. We have noticed a few of these Fairs, because inquiries have been made of us respecting them. We hope they will all be well attended and well managed. We have a foreboding that this will be the last Fair of the American Institute, at least for a few years to come; we hope not, but we cannot get rid of this feeling at present. There can be no doubt, now, of the certainty of a World's Fair to be held in this city next year; the gentlemen who are at the head of it have surmounted every obstacle, and it is stated that it will be opened on the 1st of next May (1853), and perhaps continue for four years.

Hitherto we have spoken against this Fair, and called it Riddle's Fair; we now understand that the influence which was exerted at the World's Fair, in London, and of which some of our exhibitors, spoke to us about with unpleasant feelings, and which was deprecated, as being connected with the origin and management of the World's Fair, in New York, is no longer an obstacle. We looked upon this Fair as not National, and when it was asserted, that we were to have a Crystal Palace designed in England, which was to be a mere model form of the London one, we could not speak of the scheme, but as it deserved. But the building to be erected will be American in design and construction, and so far recommends itself to our favor. We always stated we believed it would be a benefit to this city, and so it will, and we hope and believe it will be of immense benefit to our whole country. Measures have been matured, and some discordant elements removed, to make it honorable to all engaged, and profitable to exhibitors and visitors. France, England, Austria, Russia, Prussia, Belgium, Spain, Turkey, and the Isles of the sea, will contribute to the New York Crystal Palace. We may expect to see the greatest Fair ever held in our country, in this city, next year.

Our First City Railroad.

The Sixth Avenue Railroad is now completed, as far as fiftieth street, and the cars began running on Wednesday last week. Twenty cars have been placed on it, to follow one another every five minutes. The Common Council, after this road was nearly finished, by a shameful piece of trickery, endeavored to stop it. If the effort had been successful, in all likelihood the tax payers would have been made to bear the whole expenses of the company to the song of half a million of dollars. This is essentially our first City Railroad, designed to supplant the omnibus system. It is to be hoped that it will be managed with discretion, spirit, and a sacred regard for the good of the people.

The Yacht Race.---England Learning.

The Regatta of the Royal Victoria Yacht Club, came off in England on the 23rd of last month. In the contest, the yacht America, which took the prize last year, under the able management of the Commodore of the New York Yacht Club, came in third, two other yachts being before her. This has been made the subject of some rejoicing on the other side of the water, and it has been said boastingly "the American crack clipper has been compelled to take the third place assigned to her, and the honors of the club have been nobly regained." This, we say, is not so; the America, in that race, proved herself, as she did before, to be far superior to any yacht in the Royal Club. In the race, by a mistake, she was sailed for some time on a wrong tack, and thus lost considerable time, but even after this, when the other yachts had obtained this advantage, she passed them all, and would have came in first had the breeze not fallen away almost to a calm. The fact admitted in all the accounts of this race, of the America overhauling and passing all the yachts in the squadron, when the breeze was stiff, is proof positive of her superior qualities. The America, by the regulations of the club, was only allowed to carry but one small top sail, while the winning yacht carried large balloon topsails. The name of the winning yacht is "The Arrow," she is an old stager, but during the last winter she was lengthened, and so far as it could be done, was remodelled after the America. This fact is the most honorable of all to American skill, for it proves incontestibly that the advantage and superiority of the America is owing to the higher scientific attainments of the Americans in ship-building. The sails of the English yachts were cut in the American fashion, and every thing that possibly could be done, in copying after our celebrated yacht, is an evidence that Uncle John is not too old nor too stubborn to learn from his young relative.

Lord De Blaquiere, the owner of the America, has written a letter to the London Times, in which he speaks, with enthusiasm respecting her qualities. He has sailed 7,978 miles with her since last November, and when under the most trying circumstances of wind and weather, behaved well. She has astonished many practical seamen in the Malta squadron, and has been distinguished by an almost total absence of repairs owing to the economy of her rig. He believes that her well-judged symmetrical lines, and her simple rig are the causes of her unmatched success, and he hopes that his countrymen will profit by her example.

The Flax Cotton.

This substance, about which so much has been said, and said favorably too, appears to be a failure; at least this is the view we take of the subject.

A parliamentary paper, recently printed in England, contains a further report from Sir Robert Kane, the Director of the Museum of Irish Industry, on M. Claussen's invention for the production of flax cotton. Some surprise has been expressed, that, if M. Claussen's improvement contained anything real, that the facts have not been communicated to the public. The result of the experiments in Ireland do not, however, appear to sustain the expectation that a substitute for cotton has been found in Claussen's method of working flax. The agents acting for M. Claussen found it impossible to produce satisfactory results in those works which they had themselves selected, and where they had been working previously. This was attributed to defective machinery. Sr Robert Kane, in his report, says that several interesting facts have been already ascertained as to the real nature of the material produced, and as to the true action of the material used. He expresses himself satisfied that M. Claussen's process does not at all produce a material approaching in structure or organic quality to cotton. The views of the bursting up of the fibres put forward by some of the persons, who have come forward to explain the process in public, do not appear to be well founded. The flax fibres are, in M. Claussen's process, excessively finely divided and separated from each other, but each remains still a thorough and complete flax fibre, and quite unlike cotton; and the same amount of division, and the same fineness and pliability of fibre, may be given, and often is given, to flax, by simple dressing, especially if the flax has been over-rotted. This point, as to structural character, is fundamental to the value and quality of the flax-cotton, and further experiments are to be made. It is asserted since this report that the various minor difficulties which have impeded the practical application of the discovery have been fully surmounted, and that the use of the article has been carried on with great profit for some time past by a body of individuals in Belgium.

We, however, accept the statements about its success with great caution; we are positive that many falsehoods have been told about the cheapness of this production. A patent has been secured for the United States, and a company has been formed for carrying out its objects, but the company, so far as we learn, have done nothing to merit much attention in the way of successfully competing with cotton. We were informed some time ago, that a factory to carry out Claussen's patent had been started at Fall River; but its products are very dilatory in coming to market. On page 125, Vol. 6, Sci. Am., we stated that the nature of what was called flax-cotton was "entirely different from *cotton*," and the testimony of Sir Robert Kane corroborates our statement. It seems then, that the flax-cotton, so far, has failed to realize the expectations of many, and at the same time, has not turned out according to the representations of those particularly interested in making good their own assertions about the superiority and advantages of the discovery.

Telegraph Batteries.

A few weeks ago we published a few statements respecting an invention made by Geo. Little, in Electric Telegraphs, and the "New York Courier and Enquirer" copied them. Some person connected and acquainted with telegraphs, has endeavored to correct some things in the short article, but it is very evident that he is a careless reader. It was thus stated in the article referred to—"Mr. Little calculated to save $200,000 to the Telegraph Companies; he does not use platinum, mercury, nitric acid, nor sulphuric." Out of this the corrector goes on to prove that this cannot be, as the batteries for all the telegraphs in our country involve only an expense of about $12,000 per annum. This may be true; we know that Mr. Jones puts down the expense for batteries at a far lower figure—only $6,100—but the article referred to did not state that the whole saving was to be effected in the battery—it only states he does not use certain materials, and no more. He also asserts that Mr. Little "has discovered nothing new, that the idea of substituting the magnetic electric machine for the galvanic battery, is not a new one. In 1845, Prof. Morse made the experiment on the magnetic principle on the line between Baltimore and Washington, using a magnetic electric machine belonging to Dr. Page, of the Patent Office." He also states that Mr. Davis, of Boston, and Mr. Baily, of Detroit, made successful experiments with a like machine. We would state that like experiments were made twenty years before Prof. Morse attempted it; but how does this man know what machine Mr. Little uses? It was stated in our article that he recorded messages exactly like the chemical records of Bain; Prof. Morse never did that, and if Davis and Baily have done so, let them produce the documents.

Boiler Explosions in France.

In twenty-two years there have been only eighteen accidents in France by the explosion of boilers. In that country no locomotive, nor any steam boiler, can be used without having been first submitted to the examination and test of one of the government engineers appointed for that purpose. This plan we hope to see adopted at no distant day in our own country. Out of 10,000 boilers in use, in one year, there were only two accidents took place. It is creditable to France that she carries out the laws she has enacted.

What has been Done and what has to be Done.

There is something almost ludicrous in seeing men in this enlightened day, pulling and puffing at some severe physical toil, when the same thing can be done by a machine whose iron arms never grow weary, and whose sturdy limbs never need repose. Brick-making was one of the most slavish occupations in the world, and a few years ago all the work was done by hand, but man has been driven—in many instances against his own will—from this brutish toil, and the machine now performs that labor, leaving man to follow a nobler destiny. It is needless for us to speak of a thousand blessed substitutions of machine for manual labor, such as the grist mill for the quern; the threshing mill for the flail; the spinning wheel for the spinning frame; the hand loom for the power loom, &c., our object principally, in the few words we have to say, is to direct the attention of mechanics and inventors to the duty of observing and marking such and such severe and toilsome occupations for which machine-labor might be substituted. A company has just been formed in this city, for the purpose of sawing fire-wood by machinery into proper lengths for stoves, and selling it in that state to purchasers. Now, although wood has been sawn by machinery into proper lengths for stoves in many places, still, until now, no such wood could be purchased in this city; the wood used was all sawn by men employed for that purpose with hand saws. It may be said "the men who made it their business to saw loads of wood from door to door, were not very highly paid for their severe toil, and they will thus be thrown out of earning their daily bread, therefore such machine-labor should be discountenanced." Were the premises correct, the conclusion would meet with our assent, but machine-labor, in the aggregate, has not yet created a surplus fund of idlers; men, when thrown out of one occupation, soon fall into others, and in the majority of past instances, the changes have been beneficial. The question might be asked, why was there not such a sensible wooden company organized in this city before? we really wonder why so many of our men of capital were so long wooden headed on the subject.

In this city, where there are so many new brick buildings in the course of erection all the time, it is certainly a subject of wonder to see all the mortar and brick carried up high ladders by men, having little angular wooden boxes called "hods" on their shoulders. The labor is most oppressive and severe; in our opinion, it could well be superseded by machinery, so as to save running up and down the ladders, at least; this surely could be done by block and tackle. We might present some other objects for the consideration of our readers, but as we have so many sermons to deliver in one year, we have said enough upon this text at present.

Extension of a Patent.

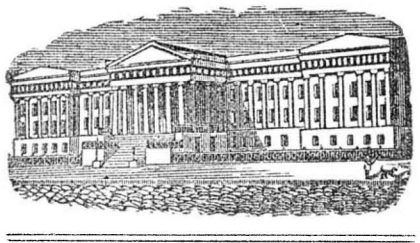
On the petition of Elisha K. Root, of Hartford Conn., praying for the extension of a patent granted to him the 10th day of December, 1838, for an improvement in punching or forming the eyes of axes, hatchets, &c., for seven years from the expiration of said patent, which takes place on the tenth day of December, 1852.

It is ordered that the said petition be heard at the Patent Office on Monday the 1st of November, 1852, at 12 o'clock M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing, must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

THOS. EWBANK, Com. of Patents.

Washington, August 12, 1852.



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING AUGUST 10, 1852.

PROCESSES FOR MAKING ILLUMINATING GAS—By H. W. Adams, of New York City: I claim the process of manufacturing illuminating gas, substantially as set forth, the process of feeding into heated retorts charged with bituminous coal, either oil, coal tar, resin, or asphaltum, or any other bituminous or carbonaceous substances, separately or mixed, and reduced to a fluid state, and decomposing the same in the same retort, and by the use of the same heat, in conjunction with the distillation of the coal, in the manner and for the purposes substantially as described.

DOUBLE GRATES—By J. S. Brown, of Washington, D. C.: I claim the arrangement of the forked rods, or their equivalents, in combination with the inclined track and roller, for the purpose of causing the gate always to swing in the direction from the rider, substantially as set forth.

I also claim the combination of the latch, catch, and pin, or their equivalents, substantially in the manner and for the purpose set forth.

CASTING TYPE—By Wm. P. Barr (assignor to Geo. Bruce) of New York City: I claim the employment, in type casting machines, of an adjustable valve, substantially in the manner described.

CIDER MILLS—By Jarvis Case, of Selma, O.: I claim the employment of the revolving crushing cylinder or roller, with grooves cut in its periphery, the movable feeding slats or radial cogs, the eccentric rings or plates, and the scrapers, the whole being constructed, arranged and operating in the manner substantially for the purpose set forth.

MACHINES FOR DRILLING STONES—By Henry W. Catlin (administrator of the Estate of Alex. Catlin, dec'd), of Burlington, Vt.: In behalf of the within named Alex. Catlin, I claim the revolving arms or wheels, having a cavity near its centre, to receive the core of the stone, in combination with the revolving cutters, in the manner and for the purpose described.

METHOD OF SECURING MOVABLE POINTS OF RAILROAD FROGS—By Marshal Curtis & Edgar St. John, of Binghampton, N. Y.: We claim the combination of the peculiarly formed shank of the frog point, and its corresponding channel and socket, said point secured to its seat by spike and bolts or their equivalents, substantially as described.

TANNING—A. K. Eaton, of Rochester, N. Y.: I claim the combination of sulphate of potash, with the tanning liquor, substantially in the manner and for the purposes set forth.

GRAIN AND GRASS HARVESTERS—By Daniel Fitzgerald & J. H Smith, of New York City: We claim, first, the construction of the floor in the centre, upon which a man may stand to gather the grain.

Second, the construction of the rim, to which the knives are attached, for the purpose of giving the buts of the grain a bed to stand upon, while being carried through the channel to the centre.

Third, the constructing a spiral channel within the guards, for the purpose of gathering the grain within the central space.

CARRIAGES—By Jonathan Fox, of Manchester, N. J.: I claim, first, making the hubs of wheels of two discs of wood, with angular scores cut in them to which the spokes are fitted, so that as the discs are drawn together, they bend the sides as well as the edges of the spokes, said discs of wood being fitted to and confined between two plates of metal, substantially as described.

Second, the sliding perch, in combination with the levers, ratchet wheel, and pawls, or such analogous devices equivalent to these, as will raise the hind end of the body of the carriage, and load when the hind axle stops, while the fore one moves forward; the weight of the hind end of the body and load adding, as it descends, in propelling the hind axle forward, the body being made to slide upon the rocker of the forward axle, as described or otherwise.

Third, the sliding perch, in combination with the levers, or such analogous devices equivalent thereto, as will raise the load or a part of it, when the team or moving power starts, so as to partially relieve the team and carriage from the sudden jerk and shock to which it is subject, when the connection is firm and unyielding.

MANUFACTURE OF GLASS LENSES—By J. A. Gilliland, of New York City: I claim the manufacture of droptric lenses of glass in steps or rings by pressure in metallic moulds, as specified.

METHOD OF CONVERTING RECIPROCATING INTO ROTARY MOTION—By Chas Howard, of Alton, Ill.: I claim an apparatus, substantially such as described, for converting a reciprocating motion into a rotary one, or converting a rotary into a reciprocating motion, consisting of the wheel, levers (four) and connecting rods (two), or their equivalents, for the purpose specified.

MODE OF DRYING SIZED PAPER—By Jos. Kingsland, Jr., of Saugerties, N. Y, and Norman White, of New York City: We claim the process of drying sized paper, by passing it between a series of trunks, perforated on two sides, and so arranged that the hot air passing through these perforations, will come in contact with both sides of the paper, and then escape, and not run or be confined with the sheets.

REDUCING GOLD MINERAL—By Wm. Longmaid, of Beaumont Square, England. Patented in England Jan. 29, 1852: I do not claim the use of lime, when forming fluxes; but I claim the use of iron, substantially as described, to extract portions of gold, when the same are not readily precipitated by their density.

LOOMS FOR WEAVING PILE FABRICS—By Samuel Richardson, of Claremont, N. H.: I claim the spring flaps, or their equivalents, which open and close the pincers upon the wires, and support the wires after they are drawn from the loops, and carried to a proper position to be inserted between the sheds of warp and guiding them into the same, substantially as described.

RAILROAD CAR BRAKES—By John Schoenhen, of Reading, Pa.: I claim the method of arranging and operating the parts which render the brakes inoperative, at the pleasure of the engineer or other hand, viz., hanging the drops from arms on arbors, with arms projecting in a contrary direction to the arms, I, and connected by links midway to a lever, the end of which is the fulcrum; the power being applied to the other end, through the eye by means of the rope which passes through loops along the entire train, to the rear end of which it is made fast, the same devices being repeated and capable of instantaneous action on each car, the arrangement thus having nothing in itself antagonistic to the end in view, the rope being always slack, and by its own weight and motion, when the train is under way, keeping the drops up and out of the way of the brakes, so that the brakes are always operative unless the engineer, by winding up the rope, throws down the drops, and renders the brakes inoperative for the time being; the whole being substantially as described, by no means intending to claim, however, the interruption of the operation of the brakes, actuated by the crowding of the cars upon the locomotive, by the interposition of drops, when these are interposed by mechanism, the weight and motion of which, when the train is under way, is antagonistic to the counterbalance intended to keep the drops up and out of the way of the brakes.

HATS—By Benj. Sherwood, of the County of New York, N. Y: I claim, first, the attaching to a hat a ring, or part or parts of a ring, inside, to fit upon the head, and leave a space around it, for the purpose of producing ventilation, in the manner substantially as described.

Second, I claim constructing a band for the purpose of fitting easily to the head, of thin metal, made flexible, by cutting out part of the substance, in the manner substantially as described.

THREADING WOOD SCREWS—By Cullen Whipple, of Providence, R. I: I claim, first, an annular concave burr cutter for threading screws, having a helical or conical serrated thread, substantially as described.

Second, the combination of the moving rests on opposite sides of a revolving screw cutter, with the mechanism described, or the equivalent thereof, for operating the same in such a manner as to move them simultaneously towards and from the cutter, to press the blanks against the latter, to be threaded, and so that the pressure of one blank in one direction, may be counteracted by the pressure of another blank in the opposite direction, as set forth

Third, the combination of the vibrating rests with the vibrating rotating turn screws substantially as described, so that the blank may be rotated steadily, and with regularity, while the rest is carrying it towards the cutter, to sink a screw thread on it.

MILL DRESS—By J. W. Kane, of New Carlisle, O.: I do not claim a circular mill stone dress, in which the furrows are arcs of circles swept from a single centre; but I do claim the particular mill dress represented, constructed and arranged as described, or in any manner substantially the same.

COMPOSITIONS FOR PRESERVING BUTTER—By L. De Coru, of Oincinnati, Ohio—I claim the preservation of fresh butter, for any length of time, as described, using for that purpose the aforesaid chemical compound, or its equivalent, substantially in the manner and for the purpose set forth.

DESIGNS.

GRATE FRAME AND FENDER—By James L. Jackson, of New York City: two designs.

GRATE FRAME, SUMMER PIECE, AND FENDER—By James L. Jackson, of New York City.

COOKING STOVE—By Fredk. Schultz, of the District of Northern Liberties, Pa. (assignor to Wm. P. Cress, of Philadelphia, Pa)

STOVE—By Jacob Beesley & Edward Delany, (assignor to Wm. P. Cresson), of Philadelphia, Pa.

COOKING STOVE—By Jacob Beesley, (assignor to Richard Peterson), of Philadelphia, Pa.

Woodworth Patent.

[Continued from page 374.]

The abstracts which the committee have caused to be made from the records of the Patent Office, imperfect as they are, throw much light upon the subject, and tend to show a sufficient reason for withholding from the committee an account of the receipts under the patent. The connection which they show between the administrator and Mr. Wilson from the beginning, in matters relating to the patent has been so intimate and continuous as to make it equally improper and impracticable to separate them in the investigation.—The agency of Mr. Wilson seems to have been the most active and efficient, except when new grants were to be procured, and these appear to have been uniformly obtained by their joint co-operation, though always in the name of the administrator. The abstracts of the Patent Office, with the aid of the data furnished by the papers before the committee show additional receipts from assignments and licenses to the amount of $1,531,486, thus making an aggregate approaching two millions of dollars.

That even this large sum is only a fractional part of the amount of receipts is apparent, not only from the records themselves, but from other surrounding circumstances. It is well known that very few of the grants prior to 1836 have been restored since the destruction of the records by the fire which consumed the Patent Office. Many assignments of rights under the Woodworth patent were never recorded, though their existence is proved by recitals in subsequently recorded grants. A very large proportion of the grants which are entered upon the records recite only the nominal consideration of one dollar instead of stating the actual consideration. More than forty of the grants embraced in the abstract are of this description though conveying valuable rights, some of them for entire States. Many, and indeed most of the conveyances by the administrator to Wilson, state no other sum than one dollar as the consideration of the sale. Such is the grant to Wilson for the State of New Jersey on the 9th of August, 1843. Such is the grant for the State of Maryland on the same day. Such is the grant to Wilson of the District of Columbia and the States of Virginia and Tennessee on the 14th of September, 1843. Such is the deed of January 11, 1844, conveying the whole of the States of Michigan, Georgia, and Arkansas, and large tracts of territory in fourteen other States. Such is the conveyance of the whole State of Vermont, except a single county, on the 10th of March, 1845.

The sole consideration for the sale to Wilson of the re-issued patent in the 9th of July, 1845, so far as the record shows, was the sum of one dollar. And even where the record states a sum which would seem to be the actual instead of the nominal consideration, the committee find upon investigation that the amount is understated in various instances. It is of course incredible that sales so important as those above enumerated, where the pecuniary consideration expressed was the sum of one dollar, were made for that amount in fact. In the case of the deed of January 11, 1844, the administrator admits in the memorial of 1845, that the actual consideration received was $39,290. The records equally fail to show the true consideration of the sale to Wilson of the second extension. The deed of March 14, 1845, executed by William W. Woodworth himself, purports to convey the second extension, except the city of New York, in consideration of $1.000. This the administrator now admits was not the true consideration. (See memorial of 1850, page 6.) That deed, however, if the relation of the parties was merely that of buyer and seller, of course terminated the interest of the administrator. Yet, on the 28th of May, 1845, a conveyance of the same right from William W. Woodworth, administrator, by James G. Wilson as his attorney, was executed to Henry R. Wilson in consideration of $50,000; and he, on the same day, as the records indicate, reconveyed to James G. Wilson for $46,000. But it seems that the fact was established before the Senate committee of the last Congress, that the actual consideration of the sale from Woodworth to Wilson was $100,000. (Congressional Globe of 1849–50, page 461.) Many deeds were executed both before and after the last extension, by James G. Wilson as the attorney of the administrator, and it is evident that neither of them regarded it as desirable that the conveyances should disclose, when recorded, the full amount received from time to time for rights under the Woodworth patent. But another reason exists why the records of the Patent Office show only a very inconsiderable share of the proceeds accruing from the invention. A very large proportion of the rights under the first and second extension were held under licenses from Woodworth and Wilson. These licenses were not by law required to be recorded, and few of them therefore found their way to the Patent Office. It has been a favorite method with the proprietors of the patent to insure a rich, certain, and continued revenue, by exacting a fixed proportion of the gross earnings of the machines in regular periodical payments.

If the receipts from the invention had been only between one and two millions of dollars, as disclosed by the imperfect records of the Patent Office, an application for further bounty would be sufficiently extraordinary. But in the facts furnished to the committee in the printed statement and argument submitted on the part of the memorialist, in connection with those established by the other evidence, and collected mainly from the public records, data are furnished which show that the sums named bear a very small proportion to the actual revenues of the patent.

It is stated in one of the documents submitted on the part of the applicant, that one thousand Woodworth machines were in operation in this country in 1850. The administrator proved, on his application for the extension of 1842, by the affidavit of Mr. Gibson, one of the principal grantees, that he had run five of the machines for ten years, and that "the said machines will and actually do dress flooring boards to the number of one thousand a day, each machine," being an average upon each of ten thousand feet per day. In the printed statement or argument submitted to the committee on the part of Mr. Woodworth, it is stated that "one machine will plane ten thousand feet per day." In the same statement it is admitted that the public pay an average of five dollars per thousand feet for the lumber dressed in the Woodworth machines. The licenses recorded in the Patent Office show that one-fourth of the gross earnings is usually paid by the licensee to the owner of the patent; and in no instance have the committee been able to find that the average tribute exacted is less than one dollar per thousand feet for dressing ordinary lumber.

Taking these data, furnished by the memorialist himself, the gross earnings of each machine for a single day in dressing one thousand plank, or ten thousand feet, amount to fifty dollars. Of this, the clear tribute to the owner of the patent is one dollar per one thousand feet, or ten dollars upon each day's work of one machine; making, for one thousand machines, a clear tribute of ten thousand dollars for each working day, or three millions of dollars per annum, over and above the profits and tribute to the subordinate grantees and licensees. These are the results which follow from the facts furnished by the administrator. The committee are not able to vouch for the accuracy of those facts, and cannot therefore say how nearly the results approximate to the truth. They find one dollar per thousand to be far below the maximum of tribute; five dollars per thousand far below the maximum of price; and ten thousand feet per day far below the actual amount which these machines will dress, as claimed in the business advertisements of those who run them.

[To be Continued]

Bugs in Peas.

A correspondent of the Germantown Telegraph in writing to that paper on the subject of bugs in peas, says he prevents them as follows:—

When my seed peas are ripe, I pick out the best, and put them into dry glass pint or quart bottles, filling each bottle as full as possible to allow them to be corked up. Then I place the bottle or bottles in a pan of cold water, and set the pan over the fire to get hot gradually. I let the bottle remain there till the water is too hot to bear the finger in it, then take it out, and cork it up directly, and seal the cork with rosin or anything to exclude the air perfectly. This gives the egg in the pea such a dose that it ceases to live, and does not all injure the pea, as I should fear scalding would. It has answered with me for many years past, and will answer for those who will follow my directions.

Almost every pea will grow, after being taken out of the bottle and sown in the spring; and from my experience I should say that about half the peas wherein the bug remains till spring, will not grow so as to do any good. I had full proof of this several years back. That year I picked out all the sound peas and sowed them only. The chickens got among them and scratched them up in places. Having no more sound peas, I sowed the bug eaten ones, but with poor success; for only one here and there grew. This satisfied me as how far the pea bug injured the seed-pea, and led me to adopt the bottling system, which has perfectly succeeded with me. The sooner they are bottled after being dry and ripe, the better.

Australian Gold

A specimen of Australian gold has been received at the mint in Philadelphia. By an assay of a portion of it, it was found that the proportion of pure metal is 966 thousandths fine; which is equivalent to $20 per ounce, or thereabouts. Assays that have been made in England have given the result of 938 thousandths fine. Upon these facts it is presumed that Australian gold is better than California; containing less silver by 6 or 7 per cent. on the average.

While hauling up the wire cable of the electric telegraph between England and Ireland, a long and strong pull brought up an old anchor.

TO CORRESPONDENTS.

E. G. M, of Pa.—We know of no pump acting by weights only.

O S A., of N. Y.—We believe you do not infringe on Payne. We do not enter into such engagements; it would not answer to do so. The expense, in all likelihood, would be about $50; it is a subject about which we would be cautious in giving advice to apply for a patent.

C. C, Jr., of R. I.—We have not seen the apparatus of Mr. Little for telegraphing; he promised to call and exhibit it, but has not done so.

A. J, of N. Y.—It will require ten horse-power to drive the upright and the circular saw, five for each; the engine will not be strained. We do not know of any good second-hand boilers for sale at present.

J. A. Driscol, of Warren, R. I., unfortunately, deprived of both hands, desires information respecting improved artificial ones made of india rubber or gutta percha. He has heard of them, but knows not where to apply. If any of our readers are in possession of the information sought they will confer a favor by addressing a line as above.

G. P., of Md.—We do not think you could obtain a patent for the car blind, simply changing the position of the slats could not be claimed as an invention of a patentable character.

B & L, of Wis.—It is out of our power to furnish you with such descriptions as you demand. The claims we publish weekly, and such specifications as you may require must be ordered from the Patent Office.

James Maxwell, 259 Bowery, N. Y., can furnish such information as some of our readers have sought for in regard to oil mills. He will expect pay for his services.

E. B. C., of Vt.—The improvement you propose in tape measures is not new, they have been sold in this market for many years.

E L, of Troy—We shall require of you a sketch and description of your improved apparatus for ventilating cars before we can decide in reference to it. We apprehend that tubes have been abandoned as inefficient contrivances for the purpose.

R. W. A., of Ct.—We do not see anything new or patentable in your arrangement of car seats, and advise you not to make an application.

D. W. J., of Ind.—We have no engines on hand at present.

D. A. W., of —— —Rosin oil is employed, and that in a number of places; there is a work published by the Harpers, on Cotton Dyeing, price $5, we believe, which is very good.

E S., of N. H.—We do not see how the shock would be mitigated by your plan, it is new to us, but we do not believe it can accomplish the object intended. A plan for a tyre, with a bead on the inside, to fit into a groove in the rim of the wheel, is now before the Patent Office for a patent; you will perceive that it is somewhat better than to make the tyre concave on the inner side.

J. B P., of N. Y.—We have never seen the cloth wound off between two rollers, but it is easy to arrange the cloth roller so as to wind off the whole web without stopping the loom.

E. S., of S. C —The dial for registering carriages has been long known and used; we have never seen an insulator like yours, and it appears to be good. but we scarcely know how to base a claim for a patent.

"Ludo," Ill.—The report of the locomotive trial, at Lowell, was never published, that we know of, in any other channel but the newspaper.

O. R. W., of Ohio—We expect that you will be on hand with your long list of subscribers for the next volume; it will be a splendid one, this our readers expect, this they shall have.

R C, of Miss —If fuel is cheap in your place we advise you to get a steam engine of ten horse-power, with good large boiler, so that you will be able to run both an upright and circular saw, and employ some extra steam for drying the lumber; the saw dust, slabs etc, may suffice for fuel without the expense of any more, but we do not believe it, as you wish to use more steam than the amount required to drive the engine.

O. T. S., of Pa.—The Woodworth patent extension is defeated for the present; attempts may be made upon the next Congress to get it further extended; we opposed it as a matter of honest principle, because its owners had prosecuted other patentees whose inventions are entirely different from that of the Woodworth patent, and it appears to us that they must have felt and known they were doing wrong; honesty is the best policy: we advocate the rights of all but not of any one to ride down others.

A. L., of Ga.—The way for you to Payenize your planks economically, is to immerse them in a solution of the sulphate of copper.

W. R., of N. Y.—A French gentleman, in a recent communication to the Academy of Sciences, states that he prevents incrustations in steam boilers using hard water, by employing 2 lbs. of the protochloride of tin for every 35 1-4 cubic feet; this is too expensive, although he says it prevents the incrustations perfectly; we do not advise any person to use it, owing to the expense.

D. McL., of Tenn.—Parker's patent has expired; his wheel is a good one; we have always thought that he was not to be blamed for what others had done; it appears to us that he is a worthy and deserving man.

R. O. H., of California—We are glad to hear of your welfare; if you could only get coal cheap in California, your plan would be to get an engine of 50 horse-power at once; it would soon make the rock fly and the gold come into your coffers.

S. C. H., of Ohio- In the case of the Henry Clay, we are convinced that the proprietors were to blame more than the officers. A second thought will convince you that it would not be prudent to publish the letter, although we feel the same as you do.

C. J. D., of N. J.—We do not know of any one at present who would take an interest in your invention. It appears to be a good device for the purpose.

H. H., of Ct.—Holtzapfel's Mechanical Manipulation can be obtained of Messrs. Appleton, 200 Broadway. The Cyclopedia we do not find in this market.

M. K., of Mass.—It is entirely new to us to operate the cow-catcher attached to locomotives: if any advantages are derivable from it, no doubt a patent could be obtained. We have no knowledge of the prize you mention.

J. McC., of ——.—Your plan for propelling appears to be the same as that of Rumsey's. We cannot see any difference.

S. H, of Ind.—We do not see what advantage you would gain by your extra shaft connected with the governor.

J. McC., of Pa.—Experiments have proven that wood does not stand the weather in pavements of streets submitted to the action of horses-feet. The plan of Mr. Davis, which was proposed in this city two years ago, was to have square plates cast with ridges like yours, except being solid, and all dovetailed together upon a wooden foundation. If you can make your wood endure, it would answer well, still, we like the stone pavement best, if the blocks are about 6 inches by 9, of a rectangular form. Your plan is new, but it requires a test to prove its superiority.

Money received on account of Patent Office business for the week ending Saturday Aug. 14:

G. W., of R. I., $55; F. H. S., of Md., $40; R. R., of N. Y., $70; G. & Co., Paris, $350; S G, of N. Y, $20; R. L O., of Ct., $25; A. K. N, of N. Y., $40; S. J., of N. Y., $40; T. B. S., of N. J, $15; G. W. M., of Wis., $5.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Aug. 14:

C. B. H, of N. Y.; L. R. F., of Geo., D. R. R., of N. Y; W. & F., of Ct; R. R. of N. Y.; R. M. W., of Va.; R. L. O, of Ct.: V. P. & B. K., of N. Y.

Back Numbers and Volumes.

In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:

Of Volumes 1, 2 and 3—none.
Of Volume 4, about 20 Nos.; price 50 cts.
Of Volume 5, all but 4 numbers, price, in sheets, $1.
Of Volume 6, all; price in sheets, $2; bound, $2.75
Of Vol. 7, all back numbers at subscription price.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office;—stating the name of the patentee, and enclosing one dollar as fee for copying.

Patent Laws, and Guide to Inventors.

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SCIENTIFIC MUSEUM.

Steam Ether, Air.

In the last number of the Scientific American, page 381, the heat of steam and the operation of the mercury gauge were explained and illustrated; although the article in that number was complete in itself so far as it went, still this one may be taken in connection with it. There may not be much information in this to experienced engineers, but we know there is much which should be more generally diffused among our people. We quote the following two extracts from exchanges to prove this:

"COMBINATION OF ETHER WITH STEAM.—The 'Patrie,' Paris paper, says that experiments have, for some years past, been made with ether combined with steam, on board of Government vessels. The result has been that a great saving may be effected, but that the inflammable nature of ether renders it dangerous. It has just been resolved to replace ether by chloroform, and two engines of sixty horse power are to be placed in the Gallie, to enable experiments to be made."

"RAREFIED AIR ENGINES.—The Philadelphia Ledger notices an important experiment, now being made by Capt. Ericsson, sustained, it is said, by the capital of an English house. It is to double the pressure of the air, by an increase of 480 degrees of heat; the heat being produced by a very small quantity of fuel. This rarefied air is to drive a piston in a large cylinder, and this piston is to give motion to the water-wheels of a steamer. We find in a late English paper the following paragraph, which looks like the same kind of an experiment:

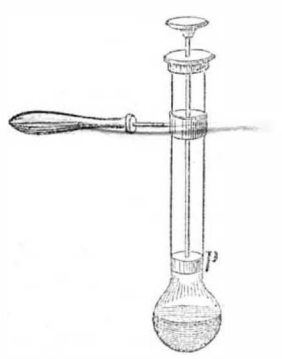
The proprietors of railways will be glad to hear of Mr. Palsey having clearly demonstrated the practicability of his compressed air-locomotive. The expense of coke is very great for the production of steam power, while the expense of coal for the production of air-power will be much less, and the expense of water for locomotives will be altogether saved. The expense of tubes and fire boxes will also be taken away. The first experiment of this invention took place on the 25th ult., the second on the 2nd inst., on the junction, a few miles below Cambridge, on the Eastern Counties Railway. The engine was charged to only 175 lbs. in the reservoir, and ran 5½ miles in 28 minutes, the speed being varied from 12 to 15 miles per hour. A higher speed was attainable by increasing the working pressure of the regulator."

Gas and air have often been tried, as substitutes for steam, but they have hitherto failed: ignorance of the nature of steam has been the cause of this, in the majority, if not all of the cases.

M. Brix, of Berlin, Prussia, in experiments made with water, alcohol, oil of turpentine, &c., proved that there was far more latent heat in water than in either of these fluids. The latent heat of steam he found was 972 degrees; alcohol, 385·2; ether, 162; turpentine, 133·2. This differs by some degrees from the experiments of Dulong and Despretz, of France, but nothing in reference to the relative degrees of heat of the liquids mentioned. The vapor of water (steam) having more latent heat, is not so dense as that of alcohol or ether, and those who get up ether engines seem to overlook this fact, or they are not acquainted with it. The specific gravity of alcohol vapor is 2·5 times that of water vapor; this is about the proportion of latent heat it has below the steam; but this also proves, that equal volumes of these two vapors possess equal quantities of latent heat. "If the latent heat of different vapors," says Graham "be proportioned to their volume, the same bulk of vapor will be produced from all liquids with the *same* expenditure of heat; and hence there can be no advantage in substituting any other liquid for water, as a source of vapor, in the steam engine." So much for any benefit that may be obtained by the use of alcohol, ether, or chlorotorm, as substitutes for steam. Let us now see what advantage is to be gained by the employment of air.

HOW DO HEAT AND WATER PRODUCE MECHANICAL EFFECT.—By the application of heat to water, the water is expanded into vapor (steam) of a bulk 1700 times greater. A cubic inch of water produces, when combined with heat, 1700 cubic inches of steam. A cubic inch of water, converted into steam, will raise 2,125 lbs. one foot high. This is the mechanical value of a cubic inch of water converted into steam by the application of heat. It costs no physical labor at all. Here is the way to work the question:—1700×15÷12=2125 lbs. one foot high. Well, then, a cubic inch of water raised into steam will push 15 lbs. to a distance of 141 2-3 feet; it can do more; can hot air do any more? No. But can this cubic inch of water, raised into steam produce no more mechanical effect? It can produce more. What is it? If the 15 lbs. were pushed through a tube 1700 inches long, by applying cold water to the outside the steam will be condensed to its original bulk, and the 15 lbs. will descend in the vacuum—the steam being re-converted into water—heat converts water into steam, and the abstraction of the heat from it re-converts it into water. This is one of the most important qualities in which steam differs from air; no known degree of cold is capable of converting air into a liquid. "It is," says Lardner, "precisely this quality, giving us the power of re-converting steam into water at pleasure, which enables us to use steam so extensively for mechanical purposes, and deprives air of the same mechanical utility." The annexed engraving, fig. 1, exhibits the principle of the application of steam to produce mechanical effect. This figure consists of a glass tube, about an inch in diameter, slightly expanded into a bulbous form at one extremity, and open at the other; a piston is made, by twisting tow about the end of a piece of straight wire, which must be fitted tightly in the tube by the use of grease. Upon heating a little water in the bulb below piston *p*, steam is generated, which raises the piston to the top of the cylinder. Here the simple elastic form of the steam is the moving power; and in this manner steam is employed in the high pressure engine. The greater the load upon the piston, and the more the steam is confined, the greater does its elastic force become. Again: the piston being at the top of the cylinder, if we condense the steam with which the cylinder is filled, by plunging the bulb in cold water, a vacuum is produced below the piston, which is now forced down to the bottom of the cylinder by

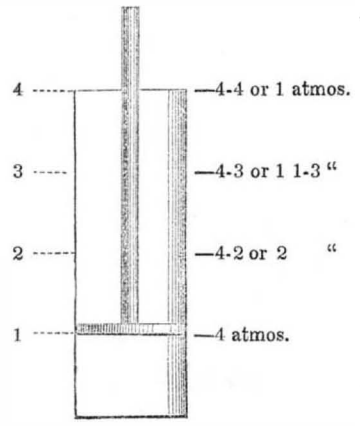
FIG. 1.



the pressure of the atmosphere. In this second part of the experiment, the power is acquired by the condensation of the steam, or the production of a vacuum; and this is the principle of the common condensing engine. In the first efficient form of the condensing engine (that of Newcomen) the steam was condensed by injecting a little cold water below the piston, which then descended, from the pressure of the atmosphere upon its upper surface, exactly as in the instrument. But Mr. Watt introduced two capital improvements into the construction of the condensing engine; the first was, the admitting steam, instead of atmospheric air, to press down the piston through the vacuous cylinder, which steam itself could afterwards be condensed, and a vacuum produced above the piston, of which the same advantage might be taken as of the vacuum below the piston. The second was, the effecting the condensation of the steam, not in the cylinder itself, which was thereby greatly cooled, and occasioned the waste of much steam in being heated again at every stroke; but in a separate air-tight chamber, called the condenser, which kept cool and vacuous. Into this condenser the steam is allowed to escape from above and from below the piston alternately, and a vacuum is obtained without ever reducing the temperature of the cylinder below 212°

USING STEAM.—A third improvement in the employment of steam as a moving power consists in using it *expansively*; a mode of application which will be best understood by being explained in a particular case. Let it be supposed that a piston, loaded with one ton, is raised four feet by filling the cylinder in which it moves with low-pressure steam, or steam of the tension of one atmosphere. An equivalent effect may be produced at the same expense of steam, by filling one-fourth of the cylinder with steam of the tension of four atmospheres, and loading the piston with four tons, which will be raised one foot. But the piston being raised one foot by steam of

FIG. 2.



four atmospheres, and in the position represented in fig. 2, the supply of steam may be cut off, and the piston will continue to be elevated in the cylinder by the simple expansion of the steam below it, although with a diminishing force. When the piston has been raised another foot in the cylinder, or two feet from the bottom, the volume of the steam will be doubled, and its tension consequently reduced from four to 4-2, or two atmospheres. At a height of three feet in the cylinder, the piston will have steam below it of the tension of 4-3 or 1 1-3 atmospheres, and when the piston is elevated four feet, or reaches the top of the cylinder, the tension of the steam below it will still be 4-4, or one atmosphere. The piston has, therefore, been raised to a height of three feet, with a force progressively diminishing from four atmospheres to one, or with an average force of two atmospheres, by means of a power acquired without any consumption of steam; but by the expansion merely of steam that had already produced its usual effect.

High-pressure steam is merely low-pressure steam compressed into smaller bulk; for example, if steam, at 30 lbs. pressure, were confined into one half the space, it would exert a pressure of 60 lbs.; in that case its latent heat would be diminished and its sensible heat increased. The working of steam expansively is now the rule among all intelligent engineers, on locomotives, steamboats, &c.

(An exceedingly interesting paper was recently read upon this subject, before the Institution of Mechanical Engineers at Birmingham, England, by D. K. Clark, of Edinburgh, that is, on working the steam expansively on locomotives; we shall present the outlines of the said paper in another number).

A short time ago there was published in a periodical of this city, devoted to the discussion of such questions, an article on explosions on the Western rivers; it was therein stated that American High Pressure Engines, Second Class, working from 80 to 150 lbs. of steam per inch, "seldom cut off at all." This is not correct, and we have the best authority from a Western engineer for saying that no such engine is to be seen on the Western waters. All of the engines on Western steamboats that rate under from 80 to 150 lbs. pressure, have, for the last fifteen years, been constructed to cut off from one-half to three-quarters—varying between these points, but seldom less or more.

There are many erroneous opinions afloat respecting the quantity of fuel required to raise water into steam at different pressures. There is no saving of fuel by evaporating water in a vacuum and no more required in raising water into steam under a pressure of 100 lbs.; the consumption of fuel in the conversion of a given quantity of water into steam, is the same, whatever be the pressure of steam produced. This is a curious but important fact. There is another one equally important to be understood by all engineers; it is this: that with the same boiler, to produce a double mechanical effect with an engine, four times the amount of fuel is required; thus to make a steamboat running only 8 miles an hour, move with a velocity of 16 miles per hour, four times the quantity of fuel will be required. Experiments with the mail steamboats running between England and Ireland, gave such results, and they accord with the experience of many engineers.

Opium Eaters.

It is estimated that there are 50,000 pounds of opium annually retailed in New York city, the greater portion of which is used in destroying the health, the intellect, and the morals of the community.—[Exch.

[Is this so? Every ounce of it is as bad as a gallon of rum, if chewed to satisfy a morbid taste.