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USEFUL RECEIPTS.

New Green Dye.

From experiments lately made by a French chemist, it appears that the Chinese possess a green vegetable dye, unknown to the rest of the world, which is used for dyeing calicoes, &c. The first essays were made with a sample of the material, but through the kindness of Mr. Forbes, the American Consul at Canton, a small quantity of the dye itself was transmitted to Europe for examination. It is in thin scales, of a blue color resembling, somewhat, Java indigo, but of a finer texture, and, moreover differing from that dye in its composition and chemical properties. On making an infusion in water, with a very small piece of this substance, the water soon changed to a blue color that reflected a greenish hue; a strip of calico, with the mordants of iron and alum steeped in it, took a real dye; the parts covered with alum passing to a sea green, more or less deep according to the strength of the mordant; those covered with alum and the oxide of iron to a dark sea green approaching an olive green, and those with oxide of iron alone to a dark olive green. The parts untouched by the mordants remained white. It is concluded, from these experiments that the Chinese possess a coloring matter (lac) with the appearance of indigo, which changes to a green color with mordants of alum and iron, and that this coloring matter contains no indigo, nor anything bearing analogy to it. The Chamber of Commerce of Paris have directed inquiries to be made concerning its origin and preparation.

Liquid Glue.

A strong liquid glue, that will keep for years without charging, may be made by placing in a glazed vessel a quart of water and about 3 lbs. of hard glue. This is to be melted over a gentle fire in a glue-pot and stirred up occasionally. When all the glue is melted, drop in gradually a small quantity of nitric acid, when effervescence will take place. The vessel is then to be taken off the fire and allowed to cool. Liquid glue made in this manner has been kept for more than two years in an uncorked bottle without any change. It will be useful for many trades, where a strong glue is required, without the trouble of melting.

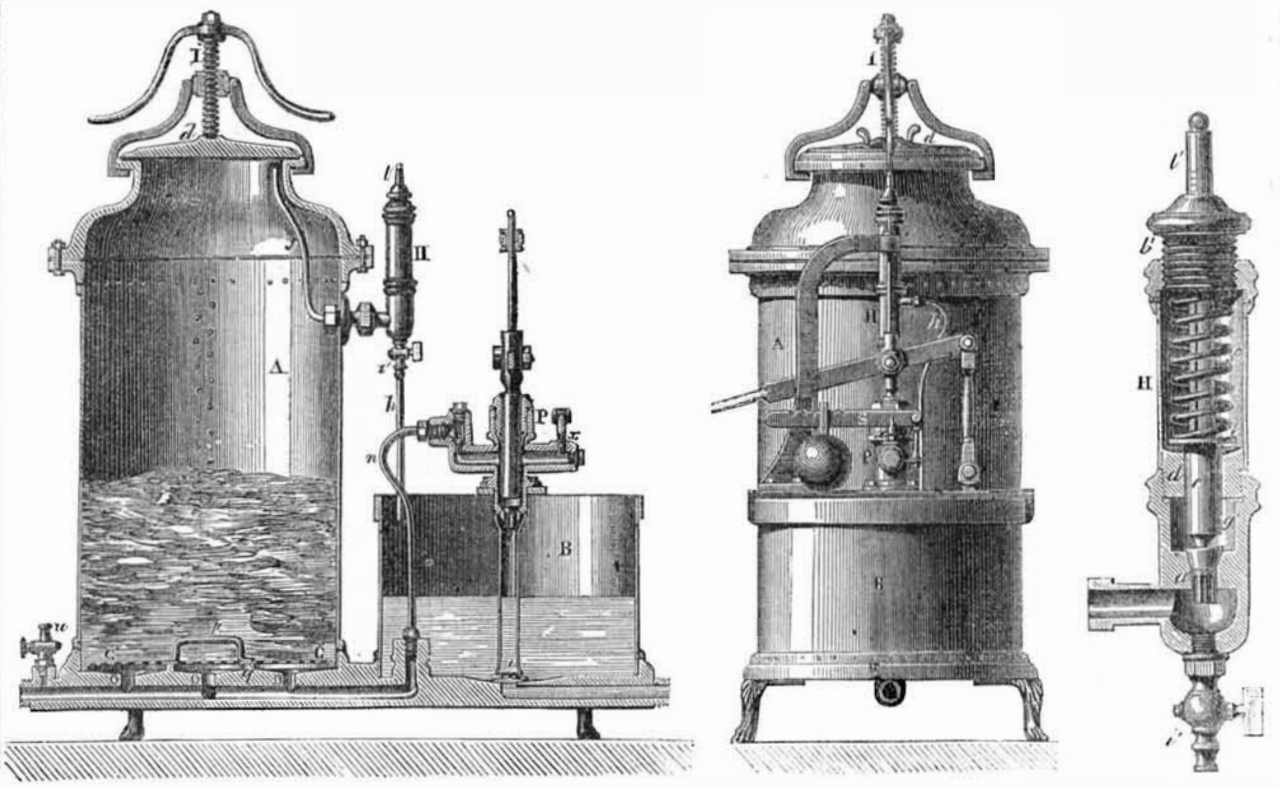
A German chemist has discovered that there is sugar in tears. What a lump of sweetness, then, Niobe must have been, who was "all tears!" Pity some married men could not contrive to distil this sweetness; their wives would supply them with the "very best moist all the year round."

A grindstone 4½ feet in diameter, in the foundry of J. L. Haven & Co., at Cincinnatti, burst on the 15th inst., doing more or less injury to three Germans at work in the room.

The St. Lawrence Mining Company has called for the last instalment on its stock, payable fifty cents on each share on the 30th inst., and fifty cents on the 31st of December.

IMPROVED METHOD OF DYEING AND BLEACHING.

Figure 1. Figure 2. Figure 3.



The annexed engravings illustrate a new process for bleaching and dyeing cotton and linen goods, invented by C. H. Metz, of Heidelberg, in Baden, Germany; it has recently been patented in France (being illustrated in the "Genie Industriel," from which we have translated this), and all the important countries in Europe. The nature of the process consists in expelling all the air from the cotton goods or yarn, in an air-tight vessel, then the dyeing and bleaching liquid is allowed to flow through all the pores of the cotton, by hydraulic pressure, by which means cold liquors are made to answer as well as hot liquors, which are now employed in dyeing, and bleaching will be accomplished in much quicker time.

Fig. 1 is a vertical section of the apparatus. Fig. 2 is a side elevation of the same; fig. 3 is a sectional view of the spring gauge for indicating the pressure. The same letters refer to like parts.

The apparatus, as may be seen from fig. 1, consists of two vessels joined together on a cast-iron plate. In one of them, A, is placed the cotton to be dyed, and is merely a cylinder of sheet tin, or, preferably, of copper, firmly closed at the upper part by a lid, *d*, which is kept tight by the hand screw, I. The plate on which this vessel is fixed has several apertures, O, for the liquid to pass through, and is covered with a thin sheet of copper, C, every where perforated. A space is left between these two, the latter being supported on a circular rim and projection, *q*, and can be also taken up when required by means of the handle, *p*. The other vessel, B, which is smaller, is entirely open at the top, and has fixed on to it a pump, P, of which the piston can be worked by hand or by any other movement. This pump is intended to draw up the liquid contained in the open vessel, B, and to send it by the pipe, *n*, into the closed vessel, A; it is constructed in a similar manner to the injection pumps of hydraulic presses, and has at its base a pipe, the end of which is perforated to allow no extraneous substance to pass, and a safety-valve, *x*, as well as two other valves. At the upper part of the closed vessel is the pipe, *f*, which forms one of the branches of a spring gauge, H; another branch, *h*, leading into the top of the vessel, B. This gauge serves to show the pressure (fig. 3), it contains a conical valve, *a'*, surmounted by a piston, *c'*, which passes through a socket, *d*, and has a circular base, *e'*, to receive the pressure of the spring, *f'*. A screw cap, *b'*. closes the top of the gauge, leaving in its centre the necessary aperture for the vertical rod, *l'*. This rod, which forms part of the piston, *c'* is graduated at the upper part to show, in atmospheres, the degree of pressure existing in the apparatus when at work. From this arrangement it is easy to be understood that if, after having filled the vessel, A, with cotton on the one hand, and having placed in the vessel, B, on the other, a suitable quantity of water the pump, P, be put in motion, it will force the liquid from the open vessel, B, into the closed vessel, A, through the perforations in the false bottom, C. Consequently the air contained in the fibres of the cotton being driven up by the liquid, rushes through the tube, *f*, into the gauge chamber. The gauge, therefore, serves at once as a regulator and indicator, because it only allows the liquid to go out when there is a sufficient pressure greater than that of the spring to open the valve (fig. 3). The liquid returns into the open vessel, B, by the pipe, *h*, the extremity of which does not extend quite to the surface of the water; it follows that the air which is expelled escapes upward, and the water can be again pumped into the closed vessel. There is a faucet, *i'* at the end of the indicator below the valve, to draw off any superfluous water, and another, *u*, at the end of the vessel, A, for inserting a manometer when required. There is also a faucet at the bottom of each vessel, for the purpose of emptying them.

In figure 1, a common hydrostatic pump is shown, with its weighted valve, S, and all the other parts. It is an invention for Bleach and Dye Works, more especially the latter, and is much better for the coloring of cotton in the wool, than in yarn or cloth. The valve, *a*, as it is acted upon by the compressed air, is lifted up until the air passes by the slots into the chamber, *g'*, which allows it to pass off through the bent tube, *h*, as shown in fig. 1.

This apparatus is presented for more than one object: it is capable of being used to impregnate skins with tannin liquor, or it can be employed for impregnating hams, &c., with salt brine; or it can be employed on a large scale for extracting air from timber, and impregnating it with the sulphate of copper to Payenize it.

Black Lead Mine.

A mine of plumbago or black lead has been worked for a few years past in New Hampshire, and supplies, to some extent, the New York market. The following is an account of the discovery:—

In April, 1848, Mr. Moses Carleton, of Lancaster, Mass., having heard that black lead had been discovered in Nelson, N. H., a town lying twelve miles east of Keene went there to see what could be found. He found the lead to be of good quality, and thinking there might be considerable of it, bought of the owner all the ores and minerals of every description on forty acres with the right and privilege to carry on the mining business to the best advantange that he could were he owner of the land, for which he paid $155. Mr. Carleton got out about five tons the first season. Finding the lead was well liked, and would sell readily at $100 per ton, he concluded to go into the manufacture more extensively. The second season he got out 40 tons, which he sold for about $4,000. The business has been increasing every year up to the present time. Last year there were 85 tons taken from the mine; this season, from April 1 to October, 100 tons, and if they continue to work until the 1st of December, which is the time the cold weather usually compels them to leave, there will be from 130 to 140 tons taken out—employing about eight men per day, with one yoke of oxen. Over 60 tons of the lead taken from the mine this season has already been sent to New York, and sold, on an average, for $100 per ton.

The freight per ton from Nelson to Keene, is $1,25, from Keene to New York $5. The freight paid upon the product of this mine this season will not be far from $800.

The Common Council of New York have passed a resolution to have a railroad in Broadway,—it has created a sensation.

MISCELLANEOUS.

A New kind of Telegraph Lines.

In the East Indies a line of telegraph has been laid down, and is now in working order between Calcutta and Kedgeree, a distance of 72 miles. This has been done by a Dr. O. Shaughnessy, an Irish gentleman. It is now proposed by the Governor-General of India, Lord Dalhousie, to unite all the important places in the British possessions in that country by electric cords. This will embrace lines of 8,800 miles long. The line which has been constructed differs entirely from any of our lines in America. The conductor (a wire with us,) is laid part of the way under ground, in a cement of melted rosin and sand, and is a five-eighth of an inch iron rod. Part of the way it is carried over ground on bamboo poles, fifteen feet high, coated with coal, tar, and pitch, and strengthened at various distances by posts of saul wood, teak, and iron wood from America. The bamboo posts are found to resist storms which have uprooted trees the growth of centuries. Though the bamboo soon decays, yet its amazing cheapness makes the use of it more economical than that of more durable and more costly materials. The branch road from Bishlopore to Moyapore passes through a swamp; the country is little less than a lake for five months; the conductor runs on foot paths between the island villages, and for some miles crosses rice swamps, creeks and jeels on which no road or embankment exists. The most diffcult and objectionable line was selected to test the practicability of carrying the conductors through swampy ground, and it has been perfectly succcessful. The Huldee river crosses the Kedgeree line half-way, and varies in breadth from 4,200 to 5,800 feet. A gutta percha wire, secured in the angles of a chain cable, is laid across and under this river, and this chain is found to afford perfect protection from the grapnells of the heavy native boats which are constantly passing up and down.

The advantages of the iron rod as a substitute for the wire, are stated to be complete immunity from gusts of wind, or ordinary mechanical violence; if accidentally thrown down, they are not injured, though passengers, bullocks, buffaloes, and elephants may trample on them: they are not easily broken or bent; owing to the mass of metal, they give so free a passage to the electric currents, that no insulation is necessary; they are attached from bamboo to bamboo without any protection, and they work without interruption through deluges of rain; the thickness of the wire allows of their being placed on the post, without any occasion for the straining and winding apparatus, whereas the tension of wires exposes them to fracture, occasions expense in construction, and much difficulty in repairs; the thick rods also admit of rusting to take place, without danger, to an extent which would be fatal to a wire. On several occasions, one village forge, carried by two coolies, has been found sufficient for welding a mile of rods in a working day. The rods, moreover, are not likely to be injured by crows or monkeys. Swarms of kites and crows perch on the lines through the swamps but they cause no harm; the correspondence flies through their claws without interruption, though on one occasion a flash of lightning struck the wet rod, and killed some scores of them. The importance of this discovery of the superiority of rods over wire will be fully appreciated in a country like India, where the line must often run through a howling wilderness, tenanted by savage beasts, or more savage men. The lines must therefore protect themselves, and this is secured by the use of thick rods.

A Fish Nursery.

Dr. Samuel J. Stratford, of Toronto, Canada, has asked Nova Scotia for a salt-water lake. He desires to make a fish nursery for salmon, lobsters, oysters, &c. The French have lately been turning their attention to schemes of the kind, and the doctor thinks he could carry out successfully at Lake Bras d'Or, in Cape Breton, a plan which, he says, would prevent the extirpation which threatens these floating aliments of man. He proposes to erect defences at Barra Strait, which would prevent the escape of fish, and feed and protect them in the spacious enclosure. He would do this in such a way as that navigation should not be hindered. He has a method of preserving his fish alive, and so exporting them, in salt water, to foreign countries. And he expresses his confidence that he could not only supply the markets of Canada and the United States, but also those of England and the continent of Europe. This is a matter gastronomically interesting to more than one hemisphere; and we hope the Nova Scotian Legislature will give us all a chance for a little good, cheap salmon, to say nothing of the shell fish.

Modern Cyclopean Wall.

A recent number of the "Algemeine Zeitung," contains an interesting account of a visit which the writer had made to inspect the progress of building a wall in the manner called Cyclopean, at Dilsternbrook, near Kiel, in Schleswig-Holstein. He considers the effect of the work and the style of execution far superior to any of the numerous remains called by the same name, which he has seen in Italy, and goes so far as to give it the preference over any other kind of walls, so far as the plain vertical surface of the material, apart from ornamental accessories, is concerned. He thinks that the polygonal stones, exerting their pressure in all directions, must insure stronger work than the squared stones, however closely jointed, which only act in the direction of gravity. Indeed, the innumerable number of many sided and multangular stones of all sizes seem so run together into one compact mass, of which neither time nor age will get the better. Neither mortar nor any other means of binding the stones together is employed; but the greatest care is taken in fitting the granite blocks one into the other, the vacant spaces in the wall as it is carried up being accurately taken off with a lead tape, (*bleistanger*) forced with a hammer into all the angles of the openings, and then applied to the flat hewn face of the block best suited, and next to be brought to its proper shape by the workman. From the workmen he learned that the directions given them by the architect were, "Five-sided and six-sided blocks, seldom four-sided; straight lines, joint upon angle and angle upon joint, according to the lead tape, and only inclined junctions between the blocks were found to be in every graduation between the perpendicular and the horizontal, without coinciding with either of them. In this obliquity of the joints the author detected the arch principle of construction as applied to the work, and the workmen pointed out to him that each stone either presssed or supported, with every one of its sides, however numerous. Herr Mahnke was the name of the builder, who had said that the cost of the work was less than that of a square stone wall; that it was much stronger, so that he should have used it in several larger buildings if he had been acquaint with it sooner; moreover, that this kind of building was to be preferred, because every stone, large or small, can be used up in it Generally, the writer holds this polygonal or Cyclopean kind of building to be especially applicable in, first, hydraulic works, as it offers nowhere a continuous joint to the water; second, in fortifications; third, for railways in substruction and deep coverings, and in the cellar story and even in the next story of large buildings and palaces. In these mortar would be used, not as a means of connecting the stone, but only as pointing to the joints, so that the immediate contact of the stone should not be interrupted. In conclusion, the writer recommends the adoption of this method of building according to determined and clearly defined principles and rules, as altogether practical wherever the material for polygonal blocks is found.

Rain.

The drops of rain vary in their size, perhaps from one twenty-fifth to one-fourth of an inch in diameter. In parting from the clouds, they precipitate their descent till the increasing resistance, opposed by the air, becomes equal to their weight, when they continue to fall with a uniform velocity, which is therefore, in a certain ratio to the diameter of the drops; hence thunder and other showers, in which the drops are large, pour down faster than a drizzling rain. A drop of the twenty-fifth part of an inch, in falling through the air would, when it had arrived at its uniform velocity, only acquire a uniform celerity of eleven feet and a half per second; while one-fourth of an inch would acquire a velocity of thirty-three feet and a-half.

Discoveries in Persia.

The commissioners at present engaged in running the boundary line between Turkey and Persia have, in the prosecution of their work come upon the remains of the ancient palace Shushan, mentioned in the sacred books of Esther and Daniel, together with the tomb of Daniel, the Prophet. The locality answers to the received tradition of its position, and the internal evidence, arising from its correspondence with the description of the palace recorded in the sacred history, amount almost to demonstration. The reader can turn to Esther, chap. i. v., 6, there he will read of a "pavement of red, and blue, and white, and black marble in that palace."—That pavement still exists, corresponding to the description given in sacred history, and in the marble columns, dilapidated ruins, the sculpture and the remaining marks of greatness and glory that are scattered around, the Commissioners read the exact truth of the record made by the sacred penman.

Not far from the palace stands a tomb; on it is sculptured the figure of a man bound hand and foot, with a huge lion in the act of springing upon him to devour him. No history could speak more graphically the story of Daniel in the Lion's Den. The Commissioners have with them an able corps of engineers and scientific men, and most interesting discoveries may be expected. The Persian arrow-heads are found upon the palace and the tomb. Glass bottles, elegant as those placed upon the toilet table of the ladies of our day, have been discovered, with other indications of art and refinement, which bear out the statements of the Bible. Thus, twenty-five hundred years after the historians of Esther and Daniel made their records, their histories are verified by the peaceful movements of the nations of our day.

Agriculture in California.

On the 7th of last October, a large agricultural fair was held at Sacramento, which was quite an affair. An address was on that occasion delivered by Dr. John F. Morse, in which he made the following statements relative to farms of different gentlemen. He said that, on the garden of Mr. Bennett, numbering 30 acres, were raised 60 bushels of grain per acre. He employs 10 men, and realizes $595 weekly. The garden of Messrs. Smith and Barber, numbering 30 acres yields $60 a day.

Mr. Southwick, on his farm, keeps 125 cows, at a cost of $600 per month. He sells 176 gallons of milk daily, at $1 per gallon. He realizes $63,000 annually from his dairy alone. General Hutchinson, on 80 acres, realized 50 bushels per acre, which weighed 52 pounds to the bushel, and was worth $91,584.

William H. Davis, on a farm of 600 acres, keeps 2,000 head of stock. J. M. Horn, of San Rose Valley, has a farm of 200 acres, which produces 80 bushels of barley to the acre; also, 150 acres of potatoes, producing 300 bushels per acre. They are worth $4 per bushel; besides large crops of wheat and oats.

Mr. E. S. Beard, of the same Valley, has 540 acres in barley, wheat and oats, yielding, on an average, 50 bushels per acre. Also, 260 acres of potatoes, yielding 250 bushels per acre. Aggregate amount in value, $260,000.

At a late meeting of the Farmers' Club in this city (N. Y.,) Mr. Shelton, of California, stated that Indian corn did not generally flourish in California. It grew to an enormous height with small crops, from 20 to 25 feet high, at least. The climate is exceedingly changeable. Mr. S. said that he saw some Canada corn four to six feet high, the ears being near the ground. The westerly winds rush in at San Francisco, and rarify the hot air in the valley where stands the city. The branches of trees are all bent to the eastward. Various trees are so injured by wind and sand that they become stunted and grow up in a bush form. As soon as the rainy season begins, clover commences to grow, and grows very bushy and tender. The Indian Squaws gather baskets full, every day, making a kind of beverage of it. The hills and valleys are covered with wild oats and clover. The cattle and stock get very fat on these oats and clover. The clover comprises some fifteen or twenty varieties of every hue and color. The grasses are very fine; the native timothy yields from two to five tons per acre. It is ten feet high. The pin grass is of a very curious growth. An acid clover grows very abundant in the valleys; the natives make a lemonade of it; it is very healthy. He gathered one bushel of sour clover weighing 3 lbs.

The Rev. Mr. Filch, of California, stated that vegetation began in November, and dried up in June. Drought continues till November, and generally without dew. The people commence cutting barley about the last of May, and let it lay on the ground over two months, not raked up.

English Manufactories.

There were, in Yorkshire in 1850, according to tables made up, 532 woollen factories for spinning only, with 629,838 spindles, and an aggregate power of steam and water combined, of 7,431, furnishing employment to 20,153 persons, of which number 5,063 were females above 13 years of age, and 3,819 boys, 13 to 18 years—the balance being males above that. Of the weaving and spinning establishments not enumerated in the above, there were 180, employing 295,611 spindles, 30,604 power looms, and 14,002 hands, of whom 7,800 were females. Of other woolen factories besides these, there were 159, employing 6,128 persons, the number of spindles, etc., not being stated. These, however, do not include the worsted mills, which, strictly speaking, are woolen manufactories, and are arranged under another head. The number of yards of cloth annually produced is not named, nor are the wages of the hands stated; but it appears that there has been an increase since 1834 throughout the kingdom, of woolen and worsted factories, of 51 per cent., and that the hands have increased 116 per cent., while the increase in the consumption of colonial and foreign wools, which form less than one-half of the whole consumed, has been 64 per cent. From this statement, necessarily much abridged, it will be seen that the manufacture is extensive in England, and rapidly and steadily increasing.

Safety Lamp.

The ordinary spirit lamps are open to many objections, some of which have been obviated by a new safety spirit-lamp, invented by Alexander J. Walker, of New York City, who has taken measures to secure a patent. The improvement consists in the employment of a movable circular plate, resting on a flange round the inner neck of the lamp, and to which the wick tubes are fixed. This plate is connected with the cap or top of the lamp by means of a vertical rod, a spiral spring being wound round that part which is between the before-mentioned cap and plate. Now, when the top is unscrewed, this rod slides down and carries with it the wick tubes, by which the light is immediately extinguished. In like manner the rod, which is made to slide freely through a circular opening in the centre of the plate when the top is screwed on, raises the wick tubes, while the before-mentioned plate being pressed down by the spring, prevents any flow of liquid otherwise than by the proper manner.

Railroad Brake.

Ledyard Colburn, of Birmingham, Conn. has taken measures to secure a patent for a new railroad brake. The invention consists of a wrought-iron shoe, which is suspended on either side of the wheel in the ordinary manner, and worked like the common brake. It can also be used in cases of extreme danger by the engineer pulling a lever, which springs the knuckle joints of the shoes, and causes them to fall on the rail under the wheels, thus raising the latter slightly from the track and stopping them, as well as throwing the friction and wear on the shoes.

The Albany and Susquehannah Railroad has been so far located as to be ready for contract. Bids for its construction have been invited, which will be opened on the 1st of December.

Machinery and Tools as they are.---The Steam Engine.

(Continued from page 75.)

Before dismissing the subject of the side-lever engine, we will make a few remarks on some parts of the machinery which are common to all the varieties of the marine engine, and foremost in importance is the subject of the condenser. Singular as it may seem, it is nevertheless certain, that the condensing engine is an invention of older origin than the high pressure engine, which latter is much less complex, and would appear likely to have first occurred to the inventor. The use of the condenser is to convert the steam, after it has done its duty in the cylinder, into water, which is effected by exposing the steam to the chilling influence of a jet of water, which passes from the sea through a pipe into the above-named vessel.

At each successive stroke of the engine it is necessary to remove the water that is in the condenser; this is effected by the air-pump, the arrangement of valves for this purpose being as follows:—The foot-valve opens to permit the water and uncondensed vapor to enter the air-pump, from which they are removed by the air-pump bucket, which is furnished with a valve opening upwards.—Another valve, termed the delivery-valve, prevents the return of the water from the hot-well into which it is pumped. The present shape of the foot and delivery valves is that of a rectangular plate working on a joint, so as to close against the valve seating which inclines at an angle. The valve of the bucket is either simply a circular plate with a hole in the centre, through which the air-pump rod passes, so as to allow the valve to slide up and down, or if that shape is rejected, the butter-cup valve is used, which is merely a semi-circular flap on each side of the bucket. It is evident that, in engines of high power, these valves are of great size; the diameter of the air-pump is about one-eighth of the diameter of the cylinder, and the area of the delivery-valve is one-third of that of the air-pump, so that the continual jarring of these valves against their seats is an evil which requires a remedy. Canvas and india rubber have been employed in the air-pump valves for this purpose, with considerable advantage. The feed-water for the boilers is taken from the hot-well and forced into them by the feed-pumps. These operations, it will be perceived, consume a considerable amount of the power, and to reduce this item of consumption is of great importance. We have mentioned that condensation is often effected by passing the steam through a great number of small tubes, which are surrounded by cold water; this allows of the employment of a much smaller air-pump, and consequently saves the power, because the condensing water has not to be pumped out, but only the water arising from the steam. The saving is, however, counterbalanced by other objections, the chief one of which has been already stated. Another mode of attaining this object, which has hitherto failed, is to expose the steam to be condensed, to the impinging on a cold metallic surface, but it is difficult, by this plan, to condense rapidly and efficiently. Could any such system be made available, the evil of employing salt water in the boilers would be got rid of, and thus cause a saving of these vessels, a diminution in the amount of fuel, and render unnecessary the operation of blowing off.

The slide valves regulate the entrance and exit of the steam to and from the cylinder, and are usually of the box or else of the D description, not having been much changed for some years. The D slide is generally preferred if the engines are of great size, being sometimes made in one long valve, and in other cases being formed of two short D slides connected by a spindle. It derives its name from the shape, which is that of a semicircle, with a strip at top and bottom, designed to close the steam ports, and projecting a little forward; the circular part, which is the back of the slide, is kept steam-tight by packing. The box slide-valve requires but little description, its name explaining its shape; suppose, for example, a shallow cast-iron box placed on the cylinder facing with the recess downwards, and the top and bottom rim made rather broad, and it will give a sufficiently accurate idea of this valve. The last-mentioned valve has been somewhat improved in many engines, by being rendered a balance-valve, of which the main object is to obviate the great pressure exerted by the steam on the back of the slide. This is effected by placing a metallic ring on the above-mentioned part of the slide which is made steam-tight by spring packing. By admitting the steam between the slide and this ring, the pressure is counterbalanced, for the ring bears against the valve-box cover as much as the face of the slide bears against the cylinder. If this construction is adopted, the valve-box cover of course must be planed and brought to a surface.

The above contrivance is particularly serviceable when the engineer requires to shift the position of the valve.

Until the epoch of transatlantic navigation, marine engineers were indifferent or incredulous to the advantages of expansion; it is now, however, generally used in all large vessels. It will be unnecessary to dwell upon its benefits, as in America its economy has been long appreciated. With reference to its employment in steam vessels, the only point in dispute is, how far it is advisable to sacrifice the saving of fuel, realized by its use, for the slight additional speed obtained by admitting the steam during the whole stroke of the piston. It is well known that expansion can be effected by a proper arrangement of the slide valve, and for this purpose some marine engines have been lately provided with the slide gearing first introduced by Stephenson, in England, for his locomotives. It is, however, generally considered preferable to use a separate valve to cut off the steam, and thus to allow the slide its full stroke. The expansion valve is regulated by a cam fixed on the main shaft, and consisting of a series of curves arranged side by side, like steps, so as to shut off the steam at any desired part of the stroke. The valve itself is a balance or equilibrium valve, and is generally of the form known as the Cornish double-beat, so that the pressure of the steam is neutralized.

We shall conclude our account of the Side-lever Engine with a few remarks on the mode of operation for connecting or disconnecting, as may be required, the crank-shaft and paddle wheels.

When, from any cause, the machinery is not in operation, although the vessel is under weigh, it is requisite to cast the paddle shafts loose from the engine, for the water acting on the floats of the paddle-wheel retards the progress of the vessel. This was formerly accomplished by removing the strap of the connecting rod, so that the whole length of the shaft, with the wheels would revolve freely. Such was a tedious mode, and various plans have been introduced to simplify the operation. The main idea, however, is the same in all, namely, permitting the paddle shafts to revolve while the crank or intermediate shaft remains stationary.

(To be Continued.)

Inventors---The Ray Premium---Conduct of the American Institute.

Messrs. Editors—In perusing your valuable paper, I have often had occasion to admire the manly independence and fearlessness with which you have upheld the rights and sustained the interests of inventors, regardless of rank or wealth; and in view of this fact, I was somewhat surprised at the mildness of your reproof, in your remarks on the conduct of the Committee of the American Institute upon the Ray Premium. You say, "it is scarcely fair to advance new conditions for testing an invention, after it has been presented." In this you are right, but I wish to say, through your columns, that, in my opinion, it is not only unfair, but positively dishonorable and dishonest, as concerning those inventors who have not the means of testing their inventions on a large scale, and who have been induced to spend their time and money upon them, on the simple conditions expressed in Mr. Ray's advertisement, of presentation at the Fair of the American Institute in October, 1852. This they have done, and now they have a right to expect that their claims will be fairly considered and acted upon; and that a committee will be appointed, possessed of sufficient scientific and mechanical knowledge to decide upon the merits of the different inventions submitted to them. If the present committee are incompetent for this business, they should be discharged, and others appointed in their stead. But it appears that inventors have been mistaken in the universality of the offer of the premium, in the view of this Committee. It was only offered to those who have the means to put their invention in operation on a large scale." To all others, "unless some good and generous patrons do it for them, the prizes have been offered in vain," i. e.—not offered at all. This conclusion of this scientific and intelligent committee reminds me of the words of a poet:—

"But if you are poor, Heaven help you!
Though your sire had royal blood within him,
And though you possess the intellect of angels, too,
'Tis all in vain, a useless matter,
The world* will ne'er inquire on such a score;
Why should it take the pains?
'Tis easier to weigh purses sure, than brains!"

* The Committee. C. F.

Buffalo, N. Y.

[We could not say any more about the action of the Committee than we have said, because we cannot obtain *positive* information about all its proceedings. We have been told that some of the Committee were not qualified for their business, and that only five minutes were allowed to each competitor to explain his invention. There appears to be something wrong, but where the fault lies we are unable to determine.—Ed.

[For the Scientific American.]

Railroad Inventions.

There appears to be a great mania for self-acting brakes, worked by the momentum of the cars, &c., and I beg to give all those gentlemen of the Brake Party a little advice; that is—they will never succeed in their plans as at present directed; for the moment you attach a complicated apparatus to railroad machinery, you are destined to fail; besides, the sudden coalition and rebounding of a train of cars will not produce power sufficient to be of any effect, without the introduction of yet more complicated machinery that will condemn itself at once. The best self-acting brake is a sober trustworthy man, with powerful but common and simple double brakes; let railroad companies pay for good men in all their departments—practical men of common sense—and you will not hear of those terrible accidents any more. But as long as railroads and steamboats are controlled by men with more tongue than brains, and more brass than knowledge, these accidents will continue to occur.

As for the self-acting brake, I helped to apply the same principle several years ago, but finding no benefit derived from it, I let the matter drop; in fact, to obtain leverage enough, the car must have an action, or space between each, of at least two or three feet, which would cause a continual oscillation, or jerking, as the couplings came into action or otherwise, and of course would cause most dangerous spaces between the platform, to say nothing of a disagreeable motion to the passengers,—as cars, to ride easy, should be firmly and closely attached to each other and to the engine, so as to render them, comparatively, one solid body, allowing no room for jerks;—then, and not till then, will passengers be freed from those disagreeable bumps or jerks when the train starts or stops. Yours, &c.,

John J. Jones, Supt. of A. R. R.

The Same Subject.

Messrs. Editors—In the Scientific American of the 13th inst., I find a description of White's Patent Equalizing or Self-adjusting Truck, and as you state that to you it appears to be a good improvement, and one that will conduce greatly to the safety of railroad travelling, I wish to point out what, in my opinion, is an objectionable feature of the invention, and which might lead to throwing the locomotive off the track, instead of tending to keep it on,—I allude to the eccentric cup or movable centre, which, if it required to be moved much to make the driving wheels track, would cause the truck to run to one side, and consequently tend to mount the rail, thereby causing the result it is meant to avoid. I call it anything but a scientific remedy for the driving wheels not tracking. There is but one correct position for the centre-plate or saddle, and that is exactly in the centre-line of the engine, and also in the centre-line of the truck, the position fore and aft may be varied with safety, as it frequently is by placing the centre-plate forward the centre of the truck, thus giving the controlling influence to the hind wheels of the truck, but it is not safe to move it sideways.

Being a railroad man I take pleasure in improvements conducing to the safety of engineers and the travelling community. With respect to carrying the weight on the centre of the truck, it is a good but not a new plan, as I will proceed to show:—some ten or more years ago, I cannot state the time exactly, I built a locomotive, which was then named the 'Owasco,' which was put upon the Buffalo and Attica Railroad, and has been in use ever since, and is now on the Buffalo and Rochester Railroad; this locomotive has a centre-cup plate, of cast-iron, chilled, and the centre-pin or saddle which is attached to the boiler is also of cast-iron chilled on the end, the truck carrying the weight on the centre, and the cup bearing allowing the truck to accommodate itself to inequalities in the road, and as far as I can learn, it has never broken a spring either upon the truck or driving wheels, and is said to be the best engine on the road for keeping the track. I do not claim to be the inventor, as I believe the invention was made by Eastwick & Harrison, formerly of Philadelphia, Pa. Yours, &c.,

W. S. Hudson.

Paterson, N. J.. Nov. 6, 1852.

[We are happy to receive communications from practical men, upon all subjects, and in order to benefit all classes we are pleased to insert their communications, whether as criticisms on inventions or as suggestions to their improvements, providing they are penned in a proper style and dictated by correct motives. —[Ed.

An Immense Iron Structure.

The Oswego Starch Company have recently had an immense iron frame put in their building, which is probably the largest structure of the kind to be found in the country. The main posts and beams of the factory, which have decayed, have been taken out and replaced by this huge iron frame, which is formed of hollow iron columns, upon which are cast-iron beams with wrought-iron trusses. This frame, which has its foundation on the rock, is five stories high, and weighs 300,000 pounds.

The Oswego Starch Factory is now the largest establishment of the kind in the United States. The factory and buildings cover one and a-half acres of ground, and are lighted by between 75 and 100 sky-lights. The buildings contain 600,000 pounds of machinery, among which are three cast iron kettles holding 1,000 gallons each; eight little pumps capable of discharging 80,000 gallons of starch an hour; five rotary and force pumps capable of discharging 5,000 gallons of water a minute; over one mile in length of water pipe; 200 vats used in the manufacture of starch, holding 800,000 gallons, and four pair of cast-iron rollers, weighing 10,000 pounds each.

This establishment gives employment to 100 men, and consumes annually from 175,000 to 200,000 bushels of corn, 800 tons anthracite coal, and from 600,000 to 800,000 feet of lumber in the manufacture of boxes and other purposes, and makes 10,000 pounds of starch a day. The machinery is propelled by four water wheels, combining 80-horse power.

Great Land Sale.

The great sale of land at San Antonio was to take place on the 8th inst. The Ledger of the 20th ult. says:—"Fifteen thousand acres of land within the town precincts will be exposed at auction. It may surprise many at a distance how we own such valuable property. Over one hundred years ago, by legal enactment, the town proper secured an area of about forty thousand acres. The late Supreme Court quieted the title to this tract by vesting in the city. The survey ranges the lots from a single acre to one hundred, according to the position of the land. The terms of the sale are particularly favorable, being one-fifth cash, and fifty years' credit on the balance, with the payment of eight per cent. interest. The inducements for investments are overpowering.

NEW INVENTIONS.

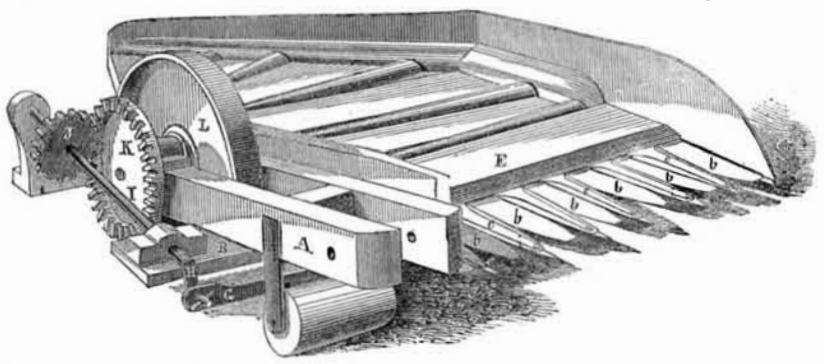
New Sewing Machine.

Alexander Tittman, of New York City, has taken measures to secure a patent for a new description of Sewing Machine. In this machine two threads are used to form the stitch, one being in the form of a loop, and the other thread being passed through the whole series of loops, thus preventing them from following the needle when it is withdrawn. The arrangement is very compact, and is well adapted to sew, besides the ordinary sort of work, anything in a circular or endless form. To admit of this variety of sewing the work is placed around the outer circumference of a hollow cylinder, as on a bed, and is moved forward for another stitch by an endless chain revolving inside, which is furnished with a number of points or teeth projecting through a slot that grasps the cloth which is being sewed. On the cylinder are fixed a vertical standard, and slides from which the needle works like wire vertically. This needle has two eyes, one near the point and the other close to the head. Within the cylinder is placed the apparatus for forming the thread (which is carried into the cloth by the needle) into a loop, and then securing the loop by a longitudinal thread. This last-mentioned arrangement consists principally of a circular shuttle (or, rather, the shape is of an oblate spheroid) with one part cut away, so as to form a point, which is used to open a way for the shuttle to pass through the loop. The shuttle has a recess, which contains a bobbin for supplying the longitudinal or lock thread. When the needle is made to descend with its attached thread (which is supplied from a bobbin) it perforates the cloth, and continuing its course, passes through an aperture in the cylinder. Whilst in the act of returning a portion of the thread (which at that moment is rather slack) is caught by the point of the shuttle and extended into the form of a loop. By a novel arrangement, the loop is freed from the shuttle, although the thread from the shuttle bobbin remains within the loop, thus holding it from re-passing the cloth. The work is pressed down in the cylinder by a spring, and is moved at each successive stitch by an endless chain, as before-mentioned, the motion of which is repeated by a ratchet wheel; all of which gearing, as well as the main driving shaft, &c., is contained within the cylinder. We must mention that the proper tension of the vertical thread is maintained by two neatly-contrived fingers, which grasp it until the needle has entered the cloth, when they relinquish the duty to the needle.

Machine for Bending Carpet-Bag Frames, &c.

Edward L. Gaylord, of Newark, Essex Co., N. J., has taken measures to secure a patent for improvements in machinery for forming Carpet-Bag Frames, and for bending flat metal bars generally, edgewise. By the ordinary method, the outer edges, after bending, do not correspond with each other, and require for that purpose to be hammered to the proper shape. The object of the above improvement is to obviate this defect by bending the outer edges to an exactly corresponding form, so that any unevenness shall be on the inner edge. The machine consists of a flat metal bed, in which are two iron clamps intended to grip the work. These clamps are formed like angle plates, so that the work is compressed both along the flat part of the bar and also along the edge. Each clamp has at one end a lug, which passes through a slot in the table, and is pierced to give a bearing to a shaft carrying an eccentric. Now, as this eccentric is made to bear against the under side of the table by a spring, if the shaft is forced around, the motion of the eccentric compels the clamps to descend. To the other end of each clamp there is firmly attached an adjustable piece of steel, which is rounded at the end, so as to suit the inner curve of the carpet-bag frame. The bending plate is hinged on to the table, so that when the former is impelled upwards, the work is compressed between it and the adjustable pieces of steel already mentioned. The turning point or pivot of the bending plate is in the line of the centre of the arc, in which the bend is to be made, and the plate is provided with jaws for holding the work. The mechanism, however, will be best described by pointing out the mode of working. The two bars to be bent being previously heated, are placed in the clamps, the parts to be bent resting on the bending plate. The workman, then, by a treadle, causes the clamps to close, and by moving the eccentric they are brought down to the bed, and made to straighten the bars both edgewise and flatwise. The workman, then, with his disengaged hand, moves a lever which impels the bending plate forward in an arc of a circle, and as its face is parallel (transversely) to that of the bed, the outer edges of the two bars are exactly parallel. There are also several ingenious contrivances to obtain precision and secure an independent motion to each clamp in the direction of the width of the bar, as well as in the mode of regulating the adjustable pieces.

IMPROVEMENT IN GRAIN REAPERS.---Fig. 1.

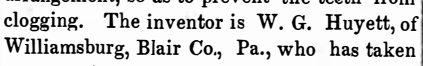


The annexed engravings represent a grain reaper which has been improved in its cutting arrangement, so as to prevent the teeth from clogging. The inventor is W. G. Huyett, of Williamsburg, Blair Co., Pa., who has taken measures to secure a patent.

Figure 1 is a perspective view of the machine. Figure 2 is a vertical side section of the cutter and shear teeth. The same letters refer to like parts.

There are two sets of cutting teeth, one set being of a triangular form like those on a straight saw blade, and which have a transverse rectilinear motion. The other set have a vibratory motion across and above the saw cutting teeth, and at the heel or inner angles have a quicker motion than at the extremity of the teeth, so as to cut and clear the grain from the corners or angles of the saw blade or cutting teeth, and thus prevent the cutters clogging up. A platform is shown having rollers on it curving round behind the machine, to direct the grain to be laid down on the cut track.

Fig. 2.

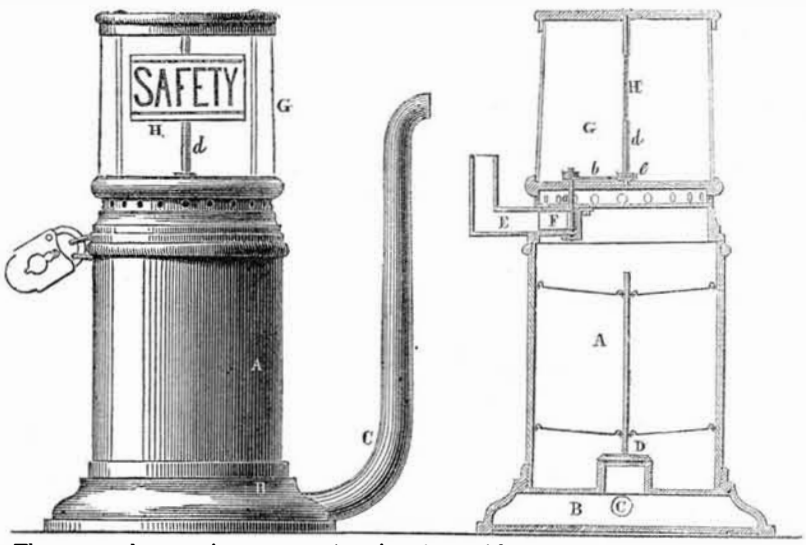


A is a strong side brace; there are two of them to support the shaft of wheel, L, and a suspended roller in front of it; K is a cog-wheel on the shaft of L. This cog wheel gears into a pinion, J, on shaft I, and gives the said shaft a rotary motion; G is the arm of the cutting blade; it is secured to the crank, H, of shaft I; E is a broad plate secured to the sides and across the frame, and covers the inner ends of the teeth. It is also attached to the side bar, B, on which is secured the vibratory rod that operates the upper set of shear teeth; *b b* are the common saw or cutting teeth; they traverse between the rake teeth, *a*,—which are the lowest—and the shear teeth, *c*, which are on the top. The rake teeth, *a*, are made fast to the frame; the shear teeth, *c*, are secured by fulcrum pins, *e*, near the point of the rake teeth. The shear teeth, *c*, on the top, are also secured at D, figure 2, to a small rod, which has a fulcrum pin passing down through the cross-bar, B, and is attached by another pin to the arm, C, of the teeth (figure 2). When the machine moves forward the crank, H, gives the cutting saw teeth a motion from side to side between the rake teeth, *a*, and the shear teeth, *e*, and this cuts the grain in the usual way. The grain is liable to choke up the teeth at the angles, because it is crowded, as it were, into a number of corners; to prevent this the upper set of teeth or blades, *c*, have a short cross motion contrary to that of the teeth *b*, and this clears away the grain and prevents the choking up of the teeth. This motion of the upper teeth is a shear cut, and is quicker at the inner ends or roots of the teeth. This is owing to the fulcrum pins, *e*, being placed near the outer extremities. The small arm which moves the upper shear teeth, *c*, has a vibratory motion by having its fulcrum pin passing into the bar, B. It is this quick motion at the inner extremities of the teeth which effectually clears them, and prevents them from clogging—a very important consideration.

More information may be obtained by letter addressed to the inventor.

SIGNALS FOR STEAM BOILERS.

Figure 1. **Figure 2.**

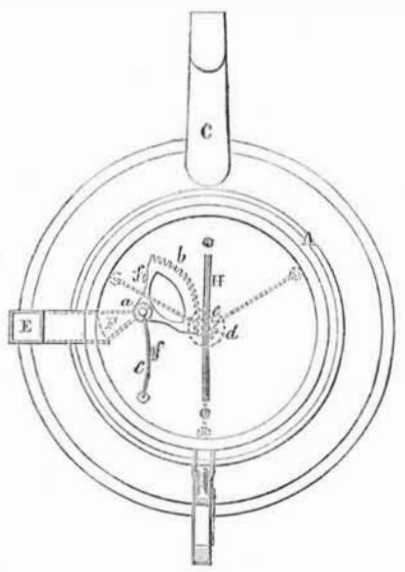


The annexed engravings represent an invention of Signals for steam boilers, for which the inventor, Birdsill Holly, of Seneca Falls, N. Y., has taken measures to secure a patent.

Fig. 1 is an elevation of a signal apparatus. Fig. 2 is a vertical section of the same through the centre. Fig. 3 is a plan view of the same with the top or cover removed. The same letters refer to like parts. This invention consists in an indicator inscribed on opposite faces with suitable words, expressive of safety and danger, and attached to a spindle or pivot, which is made to turn to the extent of half or any suitable portion of a revolution by the opening and closing, or moving of a small swinging gate or valve, or any analogous device, so placed as to be opened or moved to a certain position by the pressure of the steam escaping from the boiler through a safety or other valve, but to be closed or moved to a different position when no steam escapes to act upon it. When the safety-valve is closed, the indicator is intended to show the side denoting safety, but when open, to show the side denoting danger. The safety-valve is intended to be loaded to the pressure it is considered safe for the boiler to carry, and together with all the operating parts of the apparatus to be locked up, so as to be beyond the control of the engineer. The apparatus is to be placed in a conspicuous position—if on a steamboat, to be within view of the officers and passengers, but to be under the sole control of the Inspector, and will, in case the escape-valve is over-loaded, or otherwise prevented from opening, immediately make known any excess of pressure.

A is a chamber or vessel having a hollow bottom, the space, B, in which is always in communication with the boiler through a pipe, C. D is the safety or escape valve, which opens and closes communication between the space, B, and the inside of the chamber, A; this is loaded by the Inspector or other proper person, nearly to the maximum safe pressure. E is a pipe leading from the chamber, A, to the atmosphere, having the small swinging gate or valve, F (shown in fig. 2, and dotted in fig. 3), at its communication with the chamber. The upper part of the pivot, *a*, of the gate, F, protrudes through the bottom of the indicator case, G, which is screwed to the top of the chamber, A, and locked, but is movable for the purpose of adjusting the valves. The indicator case is made of glass and darkened on one side, or is otherwise constructed, so that its front or

Fig. 3.



most conspicuous side is transparent. The protruding upper part of the pivot, *a*, is furnished with a toothed sector, *b*, and a light spring, *c*, fig. 3, is applied to it in such a way as to make the gate, F (as shown in fig. 3), close or stand flush with the entrance to the pipe, E, which is the most favorable position for the escaping steam to act upon it. H is the indicator, which consists simply of a card or piece of sheet metal, or other material, secured to a vertical spindle, *d*, which turns freely in bearings in the top and bottom of the case, G, and carries a pinion, *e*, gearing with the toothed sector, *b*. On one side of the indicator is the word "safety," and on the other side "danger;" the former side must always show when the gate, F, is undisturbed.

If the pressure of steam in the boiler ever exceeds the weight on the valve, D, the latter is raised and the chamber, A, instantly filled with steam, which, by its pressure, overcomes the tendency of the light spring, *c*, to close the gate, F, and opens the same, making the sector, *b*, turn the pinion, *d*, half way round, and cause that side of the indicator, on which "danger" is inscribed, to be shown, and to remain visible until the proper pressure is restored, and the valve, D, closed. After the valve, D, is closed, and the steam has escaped from the chamber, A, the gate, F, is closed, and the indicator turned to show its "safety" side by the action of the spring, *c*. The distance of the indicator is regulated by two small stops, *f f*, on the bottom of the indicator case, which prevent the sector turning too far in either direction, and cause either signal to be kept in full view.

More information may be obtained of Silsby, Race & Holly, Seneca Falls, N. Y.

Scientific American

NEW-YORK, NOVEMBER 27, 1852.

Influence of Great Men.

There is no subject, apparently, upon which we differ so much from the opinions expressed by authors and editors in general, as to what constitutes "a great man." When mighty statesmen and triumphant warriors belonging to any nation fall before the scythe of death, the whole land puts on sackcloth, and goes into mourning. We have seen two recent instances of this kind in different parts of the world; we allude to the death of Webster among ourselves, and that of Wellington in England. Intellects cannot be measured by rule and square, nor can greatness be measured by public requiems and monuments. We can only form an opinion as to the greatness of men by what they have done, "by their works ye shall know them." We hear men frequently boast of the genius of Hannibal, Cæsar, Napoleon, and Wellington; of the intellect of Burke, Pitt, Hamilton and Webster; but neither warriors nor orators stand in the front rank of intellect, they must take a lower place than many men of science, whose greatness we seldom hear a word about. What intellect among warriors and statesmen can take rank with that of Galileo, Kepler, Leibnitz, Bacon, Newton, Euler, Wollaston, La Place, Black, Lavoisier, Davy, Watt, Boyle, Franklin, &c. We might mention others, but these are enough for our purpose. The works which these men have accomplished, affect all men; they meet us on the right hand and on the left every day and every night, and they will do so to others through all coming ages. The victories of Hannibal were all shattered and blasted by the single defeat of Zama, and the whole of Napoleon's conquests sunk for ever on the single field of Waterloo. It is true that the speeches and writings of statesmen and orators do not perish so suddenly; they go down and are read by succeeding generations, but at the same time new circumstances arise, which lead men who were considered wise in one generation to be looked upon by another as doubtful preceptors, or as false lights for a new age. It is different with those profound thinkers and discoverers in the scientific world; they are the intellectual Titans.—When we hear people speak of a great man, we ask what he has done, and we try his works to see if they are the genuine coin. The rolling stars by night continually remind us of Galileo, Kepler, Herschel, and La Place. There is not an apple falls to the ground but reminds us of the great Newton. The lightning fleeting from cloud to cloud, reminds us of our own Franklin, who brought it down from the skies as the hunter brings down the eagle in his flight. The lives of hundreds are saved every year by Davy's Safety Lamp. The invention of Watt has multiplied the power of man over inanimate matter more than a million fold; and the genius of Fulton has made a turnpike of the Atlantic. We would not perhaps have written upon this subject at present, but recently we have seen so much in our daily papers about great men and great intellects, and so much has been said about them by orators and others; and comparisons between this one and that one having been made, and seeing nothing at all said about men of science and inventors, whose reasonings often took sublimer flights than the imagination of Shakespeare, we have said this much and could say a great deal more to fortify our position, that warriors and statesmen must take a lower rank for genius and intellect than those men whose names we have mentioned. There are also others, of whom we have not room to speak, but assuredly our men of science, discoverers, and inventors, are the great ones (speaking of intellect,) of the earth. Time would fail us to tell how Kepler discovered the laws which govern the planets in their orbits; how Newton arranged the whole universe before his mind, and discovered the force which guides a planet in its course, a sparrow in its flight, and the great tides of the sea which refresh and fructify our shores; of Wollaston making metal threads finer than those of the spider; of Davy resolving metals out of stones by galvanism; of Stephenson driving his iron horse over mountain and moor; of Daguerre using the sun-beam for a pencil; and of Morse the lightning for his pen. Ignorant and circumscribed in intellect, must that man be, who, in speaking of great men, fails to perceive and mention the claims of philosophers and men of science.

Coating Iron with Copper.

On the 21st of last September, a patent was granted to Theodore G. Bucklin, of Troy, N. Y., for a new and improved mode of coating iron with copper, which promises to be an invention of no small importance to the arts. It has long been a desideratum to coat iron with some other and less oxidizable metal, in order to render it more enduring in exposed situations. It is more essential to have sheet and plate-iron than any other kind, covered with copper. For example, sheet-iron covered with copper, would be cheaper than tinned iron for roofs of buildings, &c., and plate-iron, if covered with copper, would be excellent for making steam boilers so as to prevent incrustations, &c. Cheapness is an important item in the process. If the process is expensive, then it can be of no general benefit, for pure copper would be preferable. If cheap it is a most important discovery. A method of covering iron with brass, copper, &c., has long been known, but to cover it and make the copper unite with the iron, like tinned iron, has hitherto been considered problematical. The invention of Mr. Bucklin promises to fulfill every condition desired in making coppered iron—cast, malleable, and wrought iron can be coated with copper by the new invention.

The process consists in first removing the oxide from the iron to be coated, then covering it with a medium metal which has a great affinity for the iron, and afterwards dipping the iron so prepared into molten copper, which, by the galvanic action of the medium metal, makes the copper intimately combine with the iron, and form a complete coating. The oxide is removed from iron by means of diluted sulphuric acid, in which the castings or sheets are rubbed with sand; after this they are washed, and dipped into a solution of the muriate of ammonia dissolved in a suitable vessel, when they are ready for the next process. This consists in dipping the sheets or plates into molten zinc, immediately after they are lifted out of the salammoniac solution. The surface of the molten zinc should be covered with dry salammoniac, to prevent the evaporization of the metal. The iron is soon covered with a coating of zinc, and forms what is termed galvanized iron. At hand, the operator has a crucible or pot containing melted copper covered with some incombustible substance as a wiper, and he at once dips the zinced iron, into this, in which it is kept until it ceases to siss, when it is taken out and found to be covered with a complete and durable coating of copper, By dipping the iron thus coppered, into the solution of salammoniac, then into the zinc, and the copper—repeating the process—coat upon coat of the copper will be obtained, until it acquires any degree of thickness. The black oxide is prevented from forming on the copper by dipping it afterwards in the salammoniac solution, and then washing it in pure water. This process is entirely different from that of Mr. Pomeroy, for which a patent was granted a few years ago, and which was published on page 69, Vol. 6, Scientific American. We have seen samples of iron coated by Mr. Bucklin's process, which were very beautiful and well covered. Unless the melted copper was covered with a non-combustible substance, the plates would come out in a very rough state, but the covering acts as a wiper, and the coppered plates come out smooth, and well coated. Brass, or any of the copper alloys, can be made to coat the iron, in the same manner as the copper. We hope this new process will be the means of extending the use of sheet-iron, so as to save considerable to the country, that is now paid out for tinned sheets.

Models! Models! Models!

We require in all cases, when models are sent to this office, that the freight charges should be pre-paid or otherwise provided for. The name and residence of the inventor should also be attached to the model, as many times we are unable to determine the proper person to address. These regulations must be strictly complied with, otherwise we cannot be responsible for any errors that are otherwise liable to occur.

False Philosophy.

Macrocosm or the Universe Without.—This is the title of a new book by William Fishbough, a candidate for philosophic fame. As it is a work which treats of subjects connected with our legitimate pursuits, and teaches a philosophy at variance with ours, it is just and proper that we should at least point out *some* of its errors. The author is not a metaphysician, nor is he skilled in scientific lore; the brilliant passages in the book bear the impress of Prof. Nichol's genius, and there is not a single new scientific *fact* recorded in its pages. There is, however, a cool thread of egotism running through the whole of it, such a self-complacent, "I know it all" spirit exhibited that is really very amusing. Subjects that would appall Newton to approach, and about which Herschel and Humboldt would confess themselves ignorant, he rushes at with an audacity that is really exhilarating. Knotty points that baffle the most eminent men of science, he unravels as easily as flying a kite, and with a few flourishes like political cheers, he sets down his doctrine as *established*.

The author teaches the development hypothesis of animal life, and plainly states that "in the lowest of the fossiliferous rocks the principal animal remains are *Radiata*, which form the connecting link with the vegetable kingdom," and he presumes "that more minute and simple species preceded these."—The development hypothesis—for it is not a theory—assumes that animal life commenced at a point, and gradually in a multitude of ages went on developing itself until man arose out of a *mite*. We believe that some of the developists hold to it that the dolphin was a very near predecessor of man. The reasoning of some advocates of this hypothesis, is indeed no better than what might be expected of a dolphin or such like fish, and they are therefore welcome to a system which intimately relates to themselves, but it is one which Hugh Miller has smashed to pieces, and which Prof. Agassiz, the eminent philosopher in a recent lecture delivered in this city gave his testimony against. Here is what he said:—

"The extinct animals found in the lowest strata, it has been imagined by philosophers, were the first created, but this supposition has been overturned by modern science, which discloses the fact that *the lowest strata* contain *radiata*, *molusca*, *articulata*, and *vertibrata*. The plan which pervades the animal kingdom at the present day, is the same which was displayed at the first introduction of animals upon this earth. The same thought which planned the arrangement of animals now living and which has assigned to their different races their respective stations, is the same which has laid them from *the beginning*. Everywhere we see *one* active mind in nature from the beginning as now, from all time and all being, and have evidence of the Creator in space, in time, and in every individual, as well as the whole animal creation."

Thus speaks a real practical man of science; how lofty and profound in comparison with the superficial development hypothesist. Our macrocosm author assumes the professorship of Doctor of the Nebular Hypothesis, which is quite in harmony with his materialist views, and development ideas.

The nebular hypothesis embraces the doctrine that the whole visible universe was once a mass of subtile gaseous matter, and that out of this, by rotation and cooling, the worlds *made themselves*. The author of this hypothesis is La Place, and his views have been embraced by many eminent philosophers, and were inculcated by Prof. Guyot, in his lectures in this city last winter, and although some portions of the heavens have lately been resolved into stars by superior telescopes, which stars were once held to be *nebulæ*, still many men are so hard or thick headed, that they cannot yet renounce their gaseous or nebulous notions.

The nebular hypothesis supposes that at one time the whole mass of matter of the sun and all the planets and satelites in our system was in a state of attenuated gas (fiery vapor,) and all rotated around the centre—a huge mass of rolling gas—the sun being the axis, and that in a multitude of ages, by certain parts cooling and shrinking, the planets were first formed into rings, then broke up into spheres, and finally assumed their present forms and positions. There are eight objections to this hypothesis, which, if removed, would leave us little to say against it.

1st. There is no evidence that the matter of this world was originally in a state of gas.

2nd. By the *known* laws of chemistry, all matter cannot be reduced to a state of gas.

3rd. By the known laws of chemistry, an isolated fiery mass of gas cannot have but a momentary existence, and by analogy never had.

4th. [Mr. Fishbough says that the mass of gas received rotation by virtue of gravitation.] Gravitation cannot produce rotary motion.—By the laws of mechanical philosophy, a body must be acted upon by two forces to give it a rotary motion.

5th. The nebular hypothesis does not account for our planets having two motions, one on their axes and another around the sun.

6th. If the whole mass of matter now forming the solar system, once rotated along with the sun as its axis, then the outermost planet should revolve round the sun in 25 days 7 hours, 48 minutes—this being the time the sun revolves on its axis (not in 27 days as Mr. Fishbough has it.) Instead of doing this, Saturn takes 29½ years to revolve round the sun.

7th. If all the matter composing our system rotated together around the sun as an axis, then all of it would still rotate in the same direction, but instead of this being the case, the satelites of the planet Uranus revolve in a contrary direction to the other planets, and not in the same plane. Well might Prof. Nichol say in reference to this fact, "a comet would be very acceptable here."

8th. The present positions, the forms, and motions of the planets cannot be accounted for by gravity nor gas. By none of the known laws of chemistry could the matter of which this earth is composed, ever have been in a state of gas. If it ever was, different chemical laws must have been in force which now have no existence, and to prove a hypothesis by a hypothesis as Mr. Fishbough does, is like exterminating problems by the following rule—0—0=1 an exceedingly convenient system of mathematics for dreamers.

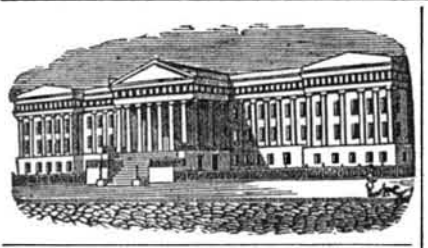
Prof. Nichol asserted while in this city, that "no calculation or deduction can ever enable the human race to trace back our system to its origin," yet in face of this Mr. Fishbough does so with the greatest ease, and lays down his deductions with the utmost *sang froid* as established facts.

To show how he understands mechanical philosophy, let us just quote another paragraph from his work:—

"The kingdom of motion and forms, therefore, have ever been and still are (and we may confidently believe ever will be) making farther and farther encroachments upon the realms of *chaos and inertia*, and whatever is conquered by the former can never be fully reconquered by the latter, and this because the former power is positive and the latter negative."

Not to speak of the grammatical richness of this sentence, here we have *motion* and forms called a kingdom, and a conquering power, and *inertia* and *chaos* called realms having no motion; the man takes states and condition of matter for its properties, as all men who are ignorant of mechanical philosophy do. Inertia is simply the passive mechanical property of matter, whereby it has no inherent power to change its condition; it belongs to a body in motion as well as a body at rest, it is as much positive as negative. Men talk about chaos with great freedom; who knows anything about it? Inertia belongs to all bodies in motion, and which have form; matter in every state, in every place, and at all times, has been, and is endowed with the property of inertia.

We might easily fill a page in pointing out erroneous views put forth in this book, but perhaps we have said enough.



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING NOVEMBER 16, 1852.

EXPANDING BITS—By Charles L. Barnes, of New York city: I claim so forming and combining the movable and stationary parts of an expansion bit, for boring different sized holes, as that a cutting edge shall at all times be preserved entirely across the bit; and at the same time, the cutting point on the moveable part thereof, shall always be parallel with the shank of the bit, or the line of the hole, as described.

I also claim the rising and falling of the movable part of the bit, as it is contracted and expanded, by means of the inclined slots and set screws or their equivalents; so that the lip on the movable part, shall become the cutter, when boring the largest size of holes, (the other lip being at rest,) and the lip on the stationary part shall become the cutter, when boring small sized holes; the other lip being at rest, by which means I am able to form the lips of the proper shape for different sized holes, without changing the cutters, as described.

SEED PLANTERS—By H. Davis, and Samuel and Morton Pennock, of Kennett Square, Pa.: We claim, first, the employment of the sigmoid, or other similarly curved or angular receiving and discharging openings, in combination with the reciprocating slide and feeding stubs, for the purposes specified; the said reciprocating slide having angular points projecting into the said sigmoid openings, for effecting the discharge of the seed from the outlets from which the stubs are receding, while the latter are feeding the seed toward the opposite extremities or outlets of the openings, during each movement of the slide, by means of the inclined sides of said points, and the movement of the slide.

FLAX PULLERS—By Lewis S. Chichester, of Brooklyn, L. I.: I do not wish to limit myself to the mere construction or arrangement of the parts.—I claim the employment of one or more pairs of rollers, as described, in combination with the fingers or separators, or their equivalents, for presenting the stalks to the bite of the rollers, to be drawn in as described; also, in combination with the rollers—the revolving arm, or arms, for collecting and drawing the stalks to the bite of the rollers, and also the employment of the fulcrum bar, as described.

CARPET LOOMS—By Jno. A. Van Riper, of New York city: I claim, first, actuating a positive let-off for the delivery of yarn, a positive take-up of the woven cloth, and a variable winding upon a beam of the cloth, delivered from the take up rollers, by the combination of the crank pin or cam on the disc, or the equivalent thereof, with the alternating bar and its appendages, as set forth.

Secondly, the method of working the trap-boards, by means of the crank cam, rock shaft, and arms, lifting rods, cam and lever, and the other devices acting in connection with these for raising and lowering and oscillating the lifting rods—the whole operating as described.

Thirdly, the temples, constructed, arranged, and operated as described; so that they will be open during the time the take-up rollers are acting, closed at the time the lay beats up.

MACHINE FOR MAKING THIMBLES FOR RIGGING, ETC.—By Wm. Field, Providence, R. I,: I claim the arranging the two halves of the forming groove, upon the adjacent ends of two independent revolving mandrels or shafts, which are free to slide towards and from each other, so as ao hold the two halves of the groove in contact, while the article is being shaped, and to separate the two halves of the groove, to allow the finished article to drop out: also the combination of the divided shaping groove, with a reciprocating former operating in connection therewith, as set forth.

COTTON SEED PLANTERS—Wm. A. Gates, Mount Comfort, Tenn.: I claim, in combination with a rotary cylinder or box, having apertures in its perimeter, the projecting edges or wings, radial ribs or plates, and projecting fingers or prongs, arranged around the axle; the whole operating to separate or disentangle the seeds to be sown, immediately previous to the disposition thereof, in the furrow—as set forth.

SASH FASTENER—By J. B. S. Hadaway, of East Weymouth, Mass.: I claim, first, the combination of the rocking plate with the angular lever, the swinging lever, and the spiral spring, constructed and arranged and operating in the manner and for the purposes specified.

Secondly, the rocking plate combined with either a simple or compound lever, in the manner and for the purpose specified.

BLIND ANE SHUTTER OPERATOR—By Robt V. Jones, of Birmingham, Pa.: I claim, the tubular shanked box hinge, with roller contained therein, as arranged with respect to the roller within the building, when the rollers are connected by a chain, and the whole is constructed as described.

TANNING—By David Kennedy, of Reading, Pa.: I claim, the use of borax in combination with nitre, alum, and terra japonica, in solutions of tannin, for the purposes set forth.

BOTTLE STOPPER—By E. & D. Kinsey, of Cincinnati, Ohio: We claim, the combination of the ball stopper together with the rod attached to it, and the guides, in the manner and for the purpose set forth.

CYLINDER PRINTING PRESS—By Joel G. Northrup, of Syracuse, N. Y.: I claim, first, such a combination and arrangement of a horizontal bed and cylinder of a printing press, as will enable each forward movement of a bed to impart a revolution to the cylinder, for the purpose of taking or giving an impression, and permit it to remain stationary during the reverse movement of the bed, as described.

Secondly, in combination with a horizontal cylinder moving in one direction, with alternate rest and motion, the inking and flying apparatus as described.

PERSPECTIVE DRAWING APYARPTUS—By Prof. Adolph Richter, of New York city: I claim, delineating natural and other objects, in a diminished or increased size, with a lens, whan used with the apparatus and in the manner described.

PRINTING PRESSES—By Stephen P. Ruggles, Boston, Mass.: I claim, hanging or balancing the bed which holds the form and moves up and down for each impression, upon springs, so as that its own weight shall compress the springs to a great extent, and the entire compression of them be completed by drawing the bed further down whilst in motion and so that the elasticity of the springs, when the bed is to rise, will raise it up to the extent of their power, and the upward motion be completed by a separate arrangement, whilst in motion, for the purpose of relieving the machine from overcoming the inertia in moving the bed from a state of rest, the power to complete its motion being applied near the termination of its movement, as described; also, the arranging of the frisket and the inking rollers in separate carriages, moving on the same ways, with such relative velocities as not to interfere with each other, and so that the frisket may carry off and bring back the sheet quickly, whilst the inking rollers may travel more slowly and do more perfect work, as described; also, the pointing of the sheet, whilst being prepared for receiving the first impression, by an automatic movement attached to some moving portion of the press; also the application of a blast of air, or its equivalent, for the purpose of forcing the sheets upon the registering points, when the paper is being prepared for the reverse impression; also the removing of the sheet from the frisket, or from the press by means of atmospheric pressure, applied in the manner described, or its equivalent; also, making the registering points adjustable in the paper table, by passing it through a friction plate, secured between two plates: also, the combination of the open toggle and adjustable eccentric shaft or pin, which operate the bed.

CARD TEETH—By Cornelius Speer, of New York city: I claim the application of the material herein described, to the front side of the leather fillet, holding the card teeth, for the purpose of bracing and supporting said teeth.

SERVING MALLETS—By Daniel H. Southworth, of New York city: I claim, first, the attachment and use of the clasp or hook to the hollow or concave part of saddle of a serving mallet, for holding it to the rope while the operator brings the end of the marline from the spool over the pulley in the handle and upper edge of the saddle to the rope, where it is made fast without being wound round both saddle and rope.

Second, the attaching to a serving mallet, one or more set or thumb screws, or any analagous devices, for the purpose of pressing upon the spool, for enabling the operator to serve the rope with any degree of tightness the yarn will bear, without winding it round both saddle rope and handle; the said screws being attached and operating in the manner and for the purpose described.

RAIL ROAD CAR SEATS—By Daniel H. Wiswell, of Buffalo, N Y.: I claim the employment of the double jointed slides and jointed rods, with the jointed arms, jointed seat and back, pillars, and supports;—arranged and operating in the manner and for the purposes herein fully set forth.

CORDAGE MACHINERY—By H. S. Jennings and C. S. Collier, of Bethany, N. Y., and T. P. How, of Buffalo, N. Y.; (Assignor to H. S. Jennings, and C. S. Collier, of Bethany, N. Y., D. Perry and A. Beardsley, of Middlebury, N. Y., and A. Hemingway, of Perry, N. Y.:) We claim regulating the speed of the receiving reel, by the tension of the rope, as described.

DESIGNS.

FRANKLIN STOVE—By Joseph Pratt, (Assignor to Bowers, Pratt & Co., of Boston, Mass.)

PARLOR GRATE—By Joseph Pratt, (Assignor to Bowers, Pratt & Co., of Boston, Mass.)

Properties of Iron.

Mechanical Properties of Metals.—By Mr. Fairbairn.

After some preliminary observations, Mr. Fairbairn stated that having been requested by the British Association at their last meeting to undertake an inquiry into the mechanical properties of cast-iron, as deducted from the repeated meltings, and feeling desirous of ascertaining to what extent it was impaired or deteriorated arrangements were made for conducting a series of experiments, calculated satisfactorily to determine this question, and to supply such data and such information as will enable the engineer and iron-founder to ascertain with greater certainty how far these re-castings can be carried with safety, or till such time as the maximum of strength is obtained, and such other properties as appear to affect the uses of this valuable and important material. Mr. Fairbairn further stated, in connection with this subject, that it was his intention to investigate another important process, which, to a considerable extent, affects the stability of some of the most important iron constructions—viz: the rate of cooling as it affects the adhesive properties of the material, and the more complete and effective process of crystalization. On these points it is well known that a rapid rate of cooling is invariably attended with risk, that an imperfect crystalline structure is obtained, and that irregular and unequal attractions are not only present, but they are frequently the forerunne rsof disruption, as well as exceedingly deceptive as regards appearances, or the dangerous consequences which invariably follow in cases of rapid cooling and unequal contraction.

On the Form of Iron for Malleable Beams or Girders.—By Mr. T. M. Gladstone.

It is, said Mr. Gladstone, on the application of wrought-iron beams or girders, that I propose to make some remarks by contrasting their powers and properties with those of cast-iron; to show what form of iron I conceive best adapted for such use, and to state as a manufacturer, what may be expected of the capabilities of iron-works to produce the same beyond previous efforts, so as to meet the increased requirements of the times. It is found, that by converting iron from a cast into a malleable state, the adhesion of the fibres of the metal under tension, becomes increased from 7 to 27, and indeed much beyond that when the best quality of material is manufactured. At the same time it is stated that the compressive strength is somewhat reduced. In this latter assumption I do not altogether concur from a permanent feature in the experiments not being sufficiently taken into account—namely, that in experimenting with wrought-iron, of a given extension, from pressure, it is necessary, before you obtain even a medium value of the resistance, a modicum of deflection must take place to bring into play each of the fibres; consequently, not like as in a rigid cast beam, where the full action of compression acts at once, some allowance must be made for the chance from the first position, in calculating the compressive forces. Assuming generally that the increased strength or tensive power of wrought, compared with cast-iron is 27 to 7, it at once reduces the six-fold area of the bottom web of the iron beam, and nearly reduces to one-half the required sectional area throughout, yet retaining an equal strength, for every purpose. In many cases this increase of strength, enabling to reduce the weight, will fully compensate for the difference in price, so that up to this point the market and effective value of both may be said to be equal. The wrought iron beam, however, possesses this material advantage, and that is, it will always give good warning before the point of danger is reached, and this, mainly from its vastly increased deflective power—indeed, before its maximum is reached a great deflection can safely take place; therefore, both for life and property, its advantage is most conspicuous. With regard to the best form for carrying the greatest weights with the least metal, I have come to the conclusion, from actual experiment on a large scale, that the double T section is the best, provided the flanges are sufficient to prevent lateral action from the load. At the Belfast iron works, the members can see iron of the section shown in the bars, of twenty-six feet long, and weighing nearly half a ton, so that it will be seen that the mills are now constructed so as to roll iron of almost any dimensions which may be required, and such bars, from the breadth of the flanges, have never before been attempted in the three kingdoms. When I had the honor, four years ago, to read a paper at the society of Arts, on the means of constructing bridges without any centreing of such proportions of iron, no iron-maker would attempt to produce such proportion of material, while now I have accomplished it, and would have no hesitation in making them much larger if required. No doubt, for warehouses, mills, public buildings, and bridges its value will now become exclusively applied and appreciated. As these bars are rolled solid throughout, on comparison I have found they will bear nearly one-third more than any made beam of equal sectional area—that is, with a beam of which the centre-rib is of plate iron, and the flanges of angle iron, and riveted thereto, and so distributed as to make the double T form. This is easily accounted for, as you necessarily weaken the whole by its being requisite to introduce riveting, while a due and equal resistance is offered from all parts by the solidly-rolled bar.

[The above are abstracts from papers read before the recent meeting of the British Association for the Advancement of Science. A great many excellent papers on real practical and scientific subjects, were read before the last meeting. Of course we could not publish them all, but as we deem it of interest and profit to our readers, without any continuance from week to week, we will sometimes present other condensed abstracts like the above.

Cheap Fuel.

A noted agriculturist, Mr. Bergen, says that fuel of an excellent quality can be grown quicker, easier, and cheaper from peach-stones, than any other mode within his knowledge. From this source he thinks the settlers upon the Western prairies might furnish themselves, within three or four years, with a constant supply.

Photographic Pictures.

Photography is but in its infancy in our country, and although it is a far more important art, and is as old as the daguerreotype, still it is but little practised in America. The difference between it and the daguerreotype, consists simply in the former embracing sun drawn pictures on paper, while the latter relates to sun-drawn pictures on metal plates. "The Talbotype" is also a name given to sun-drawn pictures on paper, after Fox Talbot, the discoverer.

When we consider that with a number of sheets of prepared paper, an artist may go forth into the woods and wilds, and with his camera copy the gigantic pine, the leaping waterfall, the snow capped mountain peak, or the embowered cottage, we may well conclude that the Talbotype is an art which is yet destined to achieve wonderful results.—Let us explain how the paper is prepared and the process conducted.

White paper of a good quality is selected, which is thoroughly impregnated with white wax by placing it upon a hot clean tin plate, and covering it with the wax in a melted state. All the superfluous wax is removed by pressing the waxed paper between sheets of blotting paper, and pressing upon the top with a hot flat iron, until the waxed paper appears to be evenly saturated. Some rice water is then prepared by intusing about 8¼ ounces of good rice in 5 pints of water.—When the glutinous portion of the rice is dissolved, the clear is poured off, and one ounce and 140 grains of the sugar of milk, one-half ounce of the iodide of potassium, 12½ grains of the cyanide of potassium, and 12 grains of the fluoride of potassium are dissolved in it.—This solution is then to be filtered through clear white filtering paper, and the waxed paper allowed to soak in it for half an hour, after which it is removed and dried carefully with a moderate heat in a clean place (not in sunshine.) With these ingredients in the proportions mentioned, it is best to make up a quantity of this liquid, and place a number of sheets in it at once, taking care to have them loose and perfectly covered. When dry, these sheets can be kept in a moderately cool place, wrapped up, for any length of time.

To render them sensitive, a solution is made up as follows:—One-half ounce of distilled water, into which are dissolved 150 grains of the nitrate of silver to which are added 186 grains of acetic acid. (Any quantity of liquid may be made up according to the proportions given, so as to prepare a number of sheets at one time. The quantities given are only for small experiments). In this solution the sheets are immersed for a short time, care being taken to remove all air bubbles from the surface of the paper; which, when it is taken out, must be dried in the dark, and may be kept afterwards (covered up from light) two or three days.

The paper is now ready for the camera obscura, in which it is placed to take the impression of any object desired, like a daguerrean plate. The time required to take an impression is from one up to thirty minutes, as experience determines, which time depends on the character of the light and the object, the picture of which is to be taken. After the paper is taken out of the camera, it is placed in a bath of two pints of distilled watea, and 64 grains of gallic acid; this brings out the picture on the paper, which, when fully developed, is fixed by soaking it for some time in a quart of distilled water, into which have been dissolved two ounces of the hyposulphite of soda. After having been taken out of this, it is well washed in clean water and dried, when it forms a well-defined negative picture, from which any number of positive impressions may be taken.

The best light to work with for obtaining good pictures on the prepared paper is under a clear sky, when the sun is shining, and when the light falls chiefly on the darker shades of the object, or scene, leaving such as are of light color under the influence of diffused light only. It requires practice to judge by the eye how to manage the time in the camera, according to the kind of light, and the object or objects to be represented.

TO CORRESPONDENTS.

D. D. S., of Conn.—We are not acquainted with what you want; but it appears to us that it would be no difficult matter to gear a loom to accomplish your object.

J. D. C., of Pa —Your self-acting Fire Alarm is essentially the same as one described in volume 3, of this journal; Invented by Messrs. Tomlinson & Hopkins, of Conn.

J. J. S., of N. Y.—We cannot furnish the information about the matter which you desire.

E. D. W., of Montreal.—We are not acquainted with a better publication upon Drawing than Minifie's work. Chapman's book, when finished, will be an excellent work; but he is now abroad and will not complete it for some time to come. J. S. Redfield, of this city, has published three or four numbers.

H. A. B., of Brooklyn.—The person on the car in motion It makes no matter how swift he is capable of jumping, he must do so along with the train, or he will find it difficult to pick himself up afterwards.

W. H., of Mass.—It makes no matter if a man has obtained a patent, he cannot prevent you from employing the same process, if that process is old and well-known. If it has been in use in a foreign country, the patent can be sustained, if it has never been patented, or published; but if it has, in either case it will nullify the patent. To be upheld by law a patent must be for a "new and useful" invention. We will look up the cases with which you are very intelligently acquainted.

J. C., of Ohio.—We will do as you have requested. Your opinion about the Hillotype, corresponds with our own. We have never seen a statement made by any one who had seen the whole process.

D. C., of Me.—Your's will receive attention.

C. W. F., of Me.—Your's is under consideration.

A. W. T., of Mass.—Brass tubing is made from sheet metal, by cutting up the sheet in long strips and bending them round a central coil or mandril, whose thicknes equals the intended internal diameter of the pipe. The two opposite edges are made to lap over each other, and in that state are soldered together. When soldered, the tube is cleaned and brightened by means of dilute acid, and is then ready for drawing. The drawing is effected by a mandril being passed through the tube, which is drawn forcibly through a circle smaller than its external diameter, and being pressed closely on every side, its internal and external surface become regular and smooth.

J. J., of Pa.—Your's will receive attention. The question had nothing to do with momentum, merely the revolution, as we stated; if the small wheels slide over its surface, in every revolution, how much does it roll? the whole revolution which will make it to describe a line as long as the large wheels.

H. L., of Ga.—Gutta Percha is hardened by mixing it with black lead. It can be obtained in this city, of Armstrong & Co., "the Gutta Percha Co."

A. A., of Md.—You might, perhaps, sell your eagle to Barnum, if it is a good specimen; but you would not earn a day's board by exhibiting it here three months. The rent of Castle Garden is about $100 per day; so you can calculate yourself what the probable chances would be for making monsy in exhibiting your eagle at that place, as you suggest.

J. B. C., of Tenn.—Our opinions are unchanged. The force of the artisan did not cease before the effect was produced; but his effort did. If you call a medium which carries the force, inertia, then you are right; but we do not view it in this light. "Inertia is that quality of matter by which it is incapable of spontaneous change." This is the best definition of it, if it is a resisting quality, than it is active, and very badly named; and should be called the law of "repulsion."

Money received on account of Patent Office business for the week ending Saturday, Nov. 20:—

A. H. B., of N. Y., $200; G. W. W., of N. Y., $30; W. C., of Conn., $20; B. F C., of N. Y., $30; C. F. B, of R. I., $20; S. K, of N. Y., $30; G. P., of N. Y., $20; J. E. A, of Ct, $20; H. B. G., of N. H., $25; D. & L. C., of Conn., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Nov. 20:

J. B. A., of Pa.; R. & S., of Pa.; W. C., of Conn.; H. A., of N. Y.. C. F. B., of R. I.; J. C., of N. Y.; J. L. B, of Ohio; T. M., of Pa.; J. E. A., of Conn.; H. B. G., of N. H.; D. & L. C., of Conn.; W. G. H., of Pa.

A Chapter of Suggestions, &c.

CHEAP POSTAGE.—The postage on the Scientific American, to subscribers residing within the State of New York, will be but 13 cts. per annum henceforth, instead of 13 cents per quarter as formerly, and will be delivered at the most remote parts of the United States for 26 cts. per annum, whereas the postage formerly demanded at distant offices was $1,20 per annum. The saving produced by the reduction of newspaper postage under the new statute, is no inconsiderable item, and many who could not afford to subscribe for the Scientific American, under the old law, can now withstand the expense.

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 four numbers, price, in sheets, $1. Of Volume 6, all; price in sheets, $2; bound, $2,75. Of Vol. 7, all; price in sheets, $2; bound, $2,75.

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.—We publish, and have for sale, the Patent Laws of the United States. The pamphlet contains not only the laws but all information touching the rules and regulation of the Patent Office. Price 12 1-2 cts. per copy.

FOREIGN SUBSCRIBERS—Our Canada and Nova Scotia patrons are solicited to compete with our citizens for the valuable prizes offered on the present Volume. [It is important that all who reside out of the States should remember to send fifty cents additional to the published rates for each yearly subscriber; that amount we are obliged to pre-pay on postage.]

INFALLIBLE RULE—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired, and the publishers will not deviate from that standing rule in any instance.

RECEIPTS—When money is paid at the office for subscriptions, a receipt for it will always be given, but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona-fide acknowledgment of the receipt of the funds.

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

TO CORRESPONDENTS—Condense your ideas into as brief space as possible, and write them out legibly, always remembering to add your name to the communication. Anonymous letters receive no attention at this office. If you have questions to ask, do it in as few words as possible, and if you have some invention to describe, come right to the business at the commencement of your letter, and not fill up the best part of your sheet in making apologies for having the presumption to address us. We are always willing to impart information if we have the kind solicited.

PATENTEES—Remember we are always willing to execute and publish engravings of your inventions, provided they are on interesting subjects, and have never appeared in any other publication. No engravings are inserted in our columns that have appeared in any other journal in this country, and we must be permitted to have the engraving executed to suit our own columns in size and style. Barely the expense of the engraving is charged by us, and the wood-cuts may be claimed by the inventor, and subsequently used to advantage in other journals.

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SCIENTIFIC MUSEUM.

Paper on Room Walls.

Bed rooms should never have papered walls; they should either be painted, or if of common plaster, simply whitewashed, two or three times every year. Painted walls allow of their being washed frequently, which is positively necessary for health and cleanliness. This cannot be performed on papered walls, therefore, let all consider that "there should be none of them." Various reasons might be adduced to back up what we have asserted, but we think this is not necessary; the annunciation is just a plainly-stated fact—a self-evident one.

In papering walls, some upholsterers and others, as we have known, sometimes employ corrupt paste, under the wrong impression that it makes the paper adhere to the wall much better than when fresh. Flour paste and glue size are both employed to put on walls for paper, and both are equally pernicious when put on in what is called a *sour state.* It is quite common for newly papered rooms to have a most unpleasant smell, and when the paper-hanger is spoken to on the subject, he will make the excuse, "oh, a few days will set all right—the smell will soon go off." A putrid odor from a newly papered wall is an evidence that the paste is corrupt, that it emits a gas—an effluvia dangerous to health, and which God has given our noses to detect, or of what use are they at all. There is nothing so sweet as fresh air, not all the perfumed waters ever made can purchase a substitute for the pure inodorous atmosphere for a room, by using them as a substitute to banish the evil smell of putrid paste arising from newly papered walls. The offensive odor will not depart until the paste is perfectly dry.

It is a very bad plan to paste new over old paper on a wall, merely to save trouble by pulling the old off. There are instances on record, of disease and death being caused by gas arising from the decaying paste of old papered walls which had become damp.

Rooms should be thoroughly dried after being papered, before they are inhabited. Some alcohol put into paste prevents its fermentation until it dries. No person should allow old paste to be used for putting on paper, and then it should be dried as soon as possible afterwards.

Use of Colored Glasses in Fogs.

The following curious observation is made by M. Luvini, of Turin:—

"When there is a fog between two corresponding stations, so that the one station can with difficulty be seen from the other, if the observer passes a colored glass between his eye and the eye-piece of his telescope, the effect of the fog is very sensibly diminished, so that frequently the signals from the other station can be very plainly perceived, when without the colored glass, the station itself could not be seen. The different colors do not all produce this effect in the same degree. The red seems the most proper for the experiment. Those who have good sight prefer the dark red, those who are short sighted like light red better. The explanation of this effect depends upon the fact that the white color of the fog strikes too powerfully upon the organ of light, especially if the glasses have a somewhat large field."

Cotton Oil.

A few days ago, says the "Mobile Register," we published a telegraphic dispatch, briefly stating that a chemist in Egypt had discovered a method of extracting oil from cotton seed. We thought it a strange announcement at the time, as the process could not be attended with much difficulty. It now appears, however, from fuller accounts, that the novelty and utility of the discovery consists in clarifying the oil, and rendering it fit for burning fluid, for manufacturers' uses, and for making soap. For these purposes it is said to be well adapted. The Viceroy of Egypt has conferred on the discoverer the exclusive right to clarify and sell the oil for ten years. We shall look with interest for further accounts of this discovery, and of the value and uses of the clarified cotton oil, as it may prove to be an invention of importance to southern planters.

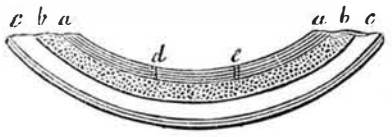
Well Sinking----Artesian Wells.

We commence a series of articles this week, on boring for water, (which will be illustrated with wood engravings in our usual style), and which we are sure will prove very acceptable and interesting to many of our readers.

Artesian wells are so named because the operation of *boring* is practiced to reach the water, and because this practice was carried on anciently with great success, in the province of Artois, in France. They differ from the common well in not being dug of a large diameter into the spring, but to a certain distance above it, and then bored with a hole of small diameter, down to the spring, which rises up and overflows. In any case, where boring for water is attempted, the water must lie under some impermeable strata, of a basin-like structure, for if such disposition exists, it follows, that when this strata is perforated, the water will rise to a height corresponding to the hydrostatic pressure. It is, therefore, only under certain conditions of geological structure, that Artesian wells can succeed.

Figure 1 is a diagram of geological conditions requisite for Artesian wells; *a a* is an impervious or retentive stratum, as clay; *b b* a pervious or water-bearing stratum of gravel or sand below it; both of them resting upon another impervious bed, *c c.* If the clay be pierced by small borings, as at *d* and *e*, the water will rise to the surface or above it.

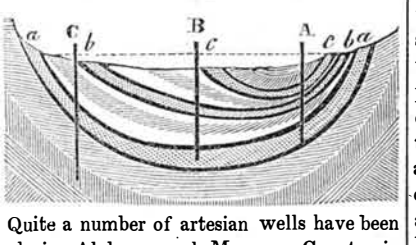
Fig. 1



In some places the basin is of such a geological character that water may be obtained at various depths, and in quantity and quality, according to the strata in which the waters are contained. This is exhibited in figure 2.

An Artesian well, sunk at the point A, would first raise the water passing into the smallest basin, which would perhaps be inconsiderable in quantity. On reaching the second basin, the volume of water would be increased, and, on penetrating to the third, or lowest basin, the whole body of water passing into the rims or gravel of all the valleys would be obtained. If the well were sunk at the point, B, the waters of the two larger basins would be obtained, and if sunk, injudiciously, at the point, C, so as to pass through the bottom of the great basin, the latter would be emptied far below the surface, and the labors and hopes of the operator frustrated.

Fig. 2.



Quite a number of artesian wells have been sunk in Alabama, and Marengo County, in that State, is supposed to have contained, at one time, a large lake, where several water basins, below one another, as shown in fig. 2, are said to exist. The first margins of the lake are represented by *a a.* This lake had been partially filled up, or its bed shifted by natural causes, when it contracted within a smaller space, and was bounded by the shores, *b* and *b.* A second change occurring, reduced the lake to the dimensions indicated by the marginal letters, *c* and *c*, and finally the lake became entirely dry, and formed the little valley between its recent shores.

Some time ago Prof. C. S. Hale furnished a very interesting article to the "Mobile Tribune," on the Geological basin of Alabama in reference to Artesian wells. The first or upper stratum is 150 feet of mottled clay and sand; the second is 150 feet of limestone; the third, 25 feet of yellow sand; the fourth, 15 feet of a clay oyster bed; the fifth, 70 feet of marly limestone; the sixth, 20 feet of a clay oyster bed; the seventh, 15 feet of sand; the eighth, 40 feet of lignite and clay bed; the ninth, 500 feet of blue marly limestone and the tenth a bed of sand. Here, then, there are three water basins or seams, as shown in fig. 2, for well boring. To reach the lowest water stratum, above, only about 300 feet have to be bored through. Quite a number of such wells have recently been sunk in Alabama, and at Millwood, in that State (near Greensboro), Dr. Withers has a mill supplied with six Artesian wells, which are in depth from 300 to 600 feet, and afford a supply of about 1000 gallons of water per minute. This water drives one of Whitelaw and Stirratt's Wheels, which is employed to run the saws in the mill.

At Cahaba, Ala., J. E. Mathews has an Artesian well 735 feet deep, which sends up a stream of 1,300 gallons per minute. This well was bored by a Mr. Reid for water to supply a cotton mill. First, a well was dug in the ordinary way, 32 feet through the red clay sand and gravel lying upon the rotten limestone. A large pine log was then procured, and a hole 3¼ inches in diameter bored through it. After sharpening the end and putting an iron band around it, the log was put down and firmly driven and forced into the rock. The well was then filled up, the upper end of the log appearing about a foot above the surface. The boring then commenced, and with the various tools and contrivances of the art, the earth was rapidly penetrated. As each lower sheet of water was reached by the tools, the water was thrown up by the whole in great quantities and with more violence. When the first water, that is, the water just below the first sand stone, was reached, the upward flow of water did not exceed seven gallons per minute. It was increased to one hundred gallons per minute when the second sandstone was perforated, and on reaching the third sheet of water, upwards of 300 gallons per minute rushed up through the orifice, seemingly impatient of its limits. Thinking that the quantity of water would be increased by enlarging the hole, they rimmed out 9¼ inches in diameter and 538 feet deep to the sand stone lying above this third bed of water, and inserted a tube from the first and resting upon the third sand stone. They were not disappointed; the water from a small stream became a large column, rushing upwards with violence at the rate of 1,300 gallons per minute, and running off in a considerable rivulet.

At Chicago they are now boring a well for the machine-shop of the Galena and Chicago Railroad; they are now down 200 feet. The well is now constantly full of soft good water. But the design of the company will not be satisfied without a good fountain. For this purpose they will bore to a depth of at least 600 feet.

In various places, beside Alabama, these wells have been sunk in our country, and the salt springs of Syracuse, N. Y., are Artesian wells; but we speak of those only which supply pure water. In Charleston, S. C., a great experiment was made two years ago, to obtain water by sinking an Artesian shaft, but after much expense and boring to a great depth, we believe the work was given up as a fruitless effort. No water can be obtained by boring unless in a basin where the hydrostatic pressure is equal to the height of the elevated land forming the brim of the depression. To sink a shaft at the outcropping of a basin is futile,—water may be reached in any quantity, but it will not be forced up for want of pressure. Care, therefore, must be exercised in examining every locality before a well is commenced, to see that geological evidences warrant, not only water, but an abundance of pressure to throw it above the surface when reached.

Boring for water is an ancient art, yet, at one time, it was nearly lost; it is now common in all parts of the civilized globe. In Egypt and Syria, and various parts of the East, there are remains of ancient Artesian wells which overflow the surface. They have long been known in China: a French missionary, named Abbe Imbert, relates that he had seen many bored wells there, of six inches diameter, and 1500 to 1800 feet deep.

In London there are a number of Artesian wells, but it is said that the supply of water from some unknown cause, has greatly decreased in them during the past two years One well in Grenoble, France, is 1800 feet deep, and sends up 1000 gallons per minute.

(To be continued.)

LITERARY NOTICES.

Ancient History of Egypt under the Pharaohs—By John Kenrick, M A., 2 vols.: J. S. Redfield, N. Y., publisher.—The work to which the above title is prefixed, consists of a History of ancient Egypt, from the most remote period until its conquest by Alexander the Great, and fills up a great vacuum in our knowledge of Ancient History anterior to the Greek and Romans For our present information of those early periods, we are mainly indebted to the researches of modern travellers, who have dug out of the bowels of the earth the sculptured records of their history. These, however, although revealed to the gaze of man, were yet sealed secrets, from the fact of their being written in symbolical characters called hieroglyphics, until by the labors of Champollion and others, they were reduced to a certain language. We are, therefore, now enabled to decypher those strange characters that appear on the monuments, tombs, and even mummies of Ancient Egypt, and to read their contents like a modern book. The present work is the fruit of these researches, and is replete with vast study and learning. It enters minutely into the history of the country, political and social, and leads us back to periods of so remote a date that we are fairly bewildered at the prying curiosity of modern civilization. At the end of the first volume there is a general phonetic alphabet, of the Egyptian characters, by means of which their Hieroglyphics can be understood.

Turnbull's Lectures on the Telegraph.—This is a new book by Laurence Turnbull, M.D., Lecturer on Technical Chemistry at the Franklin Institute, Philadelphia. The lectures were first published in the Franklin Journal, and are here collected into a respectable volume, illustrated with a great number of wood cuts. We have a great number of works on the telegraph and electrical apparatus, but this is the best and ablest of them all. It contains a brief history of telegraphing, and gives descriptions with illustrations of all the important telegraphs in use, also those which have been illustrated in other works. He speaks in high terms, and justly, of the ingenuity displayed in the House Telegraph, and the beauty of its operations Those who wish to be posted up on telegraphs, must consult this book: it is for sale by J. Hamilton, Actuary of the Franklin Institute. The price is $1,50.

The Macrocosm or the Universe without.—This is a neat volume by Messrs. Fowler & Wells, of this city, the author of which is William Fishbough, of Williamsburgh, N. Y.; so well known as being very intimately interested in Davis's first work.—We would advise every person acquainted with science to read this work, as a curiosity, purporting to be a work of science. Our opinions about its philosophy, will be found on another page.

Maury's Sailing Directions.—The Fourth edition, improved and enlarged, of this great national work, by Lieut. Maury, Superintendent of the National Observatory, has just been issued at Washington. We noticed the former edition of this work in our previous volume; this edition contains information about voyages to California, and surveys of portions of the Pacific coast, not found in the other editions. It is a most valuable acquisition to every captain who sails from the Atlantic to the Pacific, and no one should sail without it.

Book of the World—No. 3; Weik & Wieck: Philadelphia. This is an agreeable periodical for family reading, and combines instruction with amusement Each number contains 32 pages in 4to. illustrated by one steel engraving and three colored plates. Price 25 cents.