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RAIL-ROAD NEWS.

Our Railroad System.

The cure for railroad accidents by collisions would be a double track on all our railroads. The grand cure for smoke will be the employment of anthracite coal or coke for fuel in place of wood. The grand cure for dust will be to sod all the tracks, and keep them watered with a sprinkler once or twice per day during long droughts. All our railroads should be fenced in, and no track should be crossed by a common road. There must be a perfect change in our system before there will be a complete cure for the more common evils connected with our railroads. Many inventions have been brought forward to prevent dust from entering railroad cars, to arrest the sparks, to obviate the evils of smoke, and to prevent collisions. All these evils can be prevented without the employment of a single mechanical device or apparatus, by putting in practice the foregoing suggestions. At first the expense would not be small, but surely our railroads have no thought of being superceded by balloons—they surely expect to last for 50 years at least—why then, do they not adopt a system now, which, in the course of a few years, will effect a great saving and clear off all immediate outlay.

Anthracite Coal for the Reading Road.

The Philadelphia and Reading Railroad Company, we have been informed, recently received several engines of a large class, for the use of anthracite coal, built by Ross Winans, of Baltimore. They are splendid machines, and use anthracite coal exclusively, effecting a saving of fuel of nearly one-half over the use of wood. All the new engines placed on the road will be constructed for the use of coal exclusively.

It is singular that the reports of coal burning locomotives are so favorable, and yet none of the railroads but those in Pennsylvania use them.

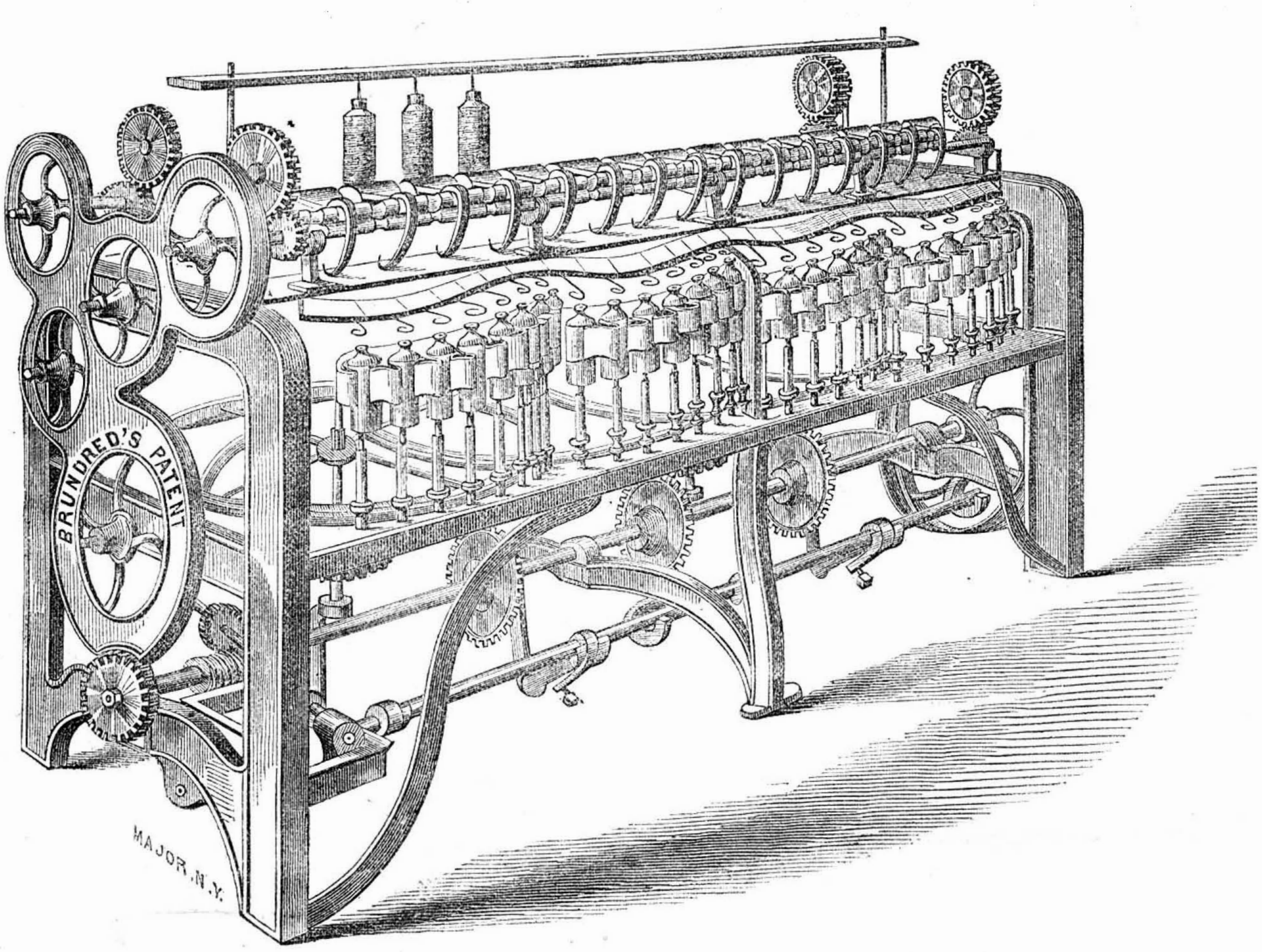
Steam Carriages for Roads.

We see it proposed in one of our daily papers, to run steam carriages in our streets in place of omnibuses. There has been no opposing opinions to the practicability of steam carriages for common roads; the difference of opinion expressed was respecting their payability. It is scarcely a question for words; they are mere gas, when the question can be settled by a practical test so easily, and there is no other way of doing it. All the newspaper discussions in creation will not make a steam carriage run nor pay on a common road; "do it and be done," is the watchword and reply.

Cleansing Window Blinds.

Soap or strong soapsuds will destroy green paint more readily than any other color; the lye has the same effect on oil paints that it has with grease, many painted rooms are spoiled by carelessness or ignorance of washwomen, in the application of soap or strong soap water; when it does not destroy the paint, it may affect the lustre.

BRUNDRED'S PATENT THROSTLE.---Fig. 1.



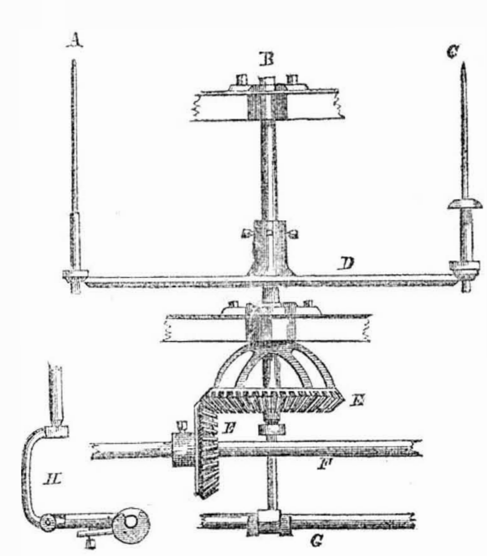
The accompanying engravings are a perspective view (fig. 1), and a section view (fig 2), of the patent Throstle Frame, for spinning cotton, as constructed by B. Brundred, Son & Co., Oldham Works, near Paterson, N. J.

The distinguishing feature of this Throstle is the use of a horizontal friction-wheel, two feet eight inches in diameter, for driving the bobbins; the bevelled edge of the bobbin tubes resting on the bevelled edge of the friction-wheel. By this arrangement, bands for the spindles are dispensed with, as well as the expense and inconvenience connected with them.

A is a spindle and tube; B is an upright shaft of the friction wheel, with its bearings in the cross-bars of the roller beam and spindle rail. C is the spindle, tube and bobbin; D is a horizontal friction wheel; E E are bevel wheels for driving the friction wheel; F is a driving shaft; G is a lifter shaft and lifter; H is a lifter shown separate.

The principle is shown above on a cup-frame, but is applicable to the several kinds of spinning, and is a very superior machine. This throstle can be built of any desired length, from 10 feet to 60 feet, and with from 64 up to 400 or 500 spindles. The traverse is 4

Figure 2.



inches, 4½ inches, or 5 inches, according to the nature of the spinning.

The following memorandums of the speed and production of this throstle have been supplied by several parties having the frame in operation:

On No. 50, 96 revolutions of the front roller per minute; on No. 36, 106 ditto; on No. 30, 112 to 115 ditto; on No. 18, 140 to 150 ditto no No. 12, 150 to 170 ditto.

On No. 14, 8½ hanks per spindle in 11½ hours; on No. 30, 6¼ ditto; on No. 19, 9 hanks per spindle in 12 hours. The motion of the spindles, by this mode of driving them, must be more steady and uniform; there will be no drawing and slacking up, as is the case by driving spindles with bands. The improvement, we believe is a good one.

Agents in New York city, W. B. Leonard & E. W. Smith, 75 Merchants' Exchange.

The New York Crystal Palace.

We understand that this work will go on; the Company is to have the Building ready by the 2nd of May, next year, at "Reservoir Square," this city. Some important regulations have been adopted to carry out the objects of the Society, and for this purpose, some discordant elements have been removed. A number of designs have been presented for the building, but only two are worth looking at; they are the English one by Paxton, and the American one by Bogardus—we have had an opportunity of looking at both plans, and we must say, that the one of Mr. Bogardus is far the best in every respect—in beauty, grandeur, originality, strength, simplicity, and economy. If erected, as it should be, it will be an honor to our country. It is in the Doric style of architecture, and is of a circular form, with a tall tower in the centre, rising grandly above all. The whole area of 400 feet in diameter will be embraced at one glance, while the changing points of beauty, owing to its form and the regularity of its columns, will be like a panorama to visitors. And one grand element in the calculation—a truly American one, is, that after it has accomplished its object in the Exhibition, it can be taken down in parts, and fitted up into a number of public or private dwellings. All the parts are so cast and fitted, that they can be taken to any part of the world, and will all dovetail together. This is a very different feature from the London Crystal Palace. Whatever the projectors of this Crystal Palace may do for the improvements of the arts, it will add to their reputation if this noble design be adopted by them.

Investigations have been made in London, of cayenne pepper, which have resulted in detecting its adulteration with some deadly poisons, such as red lead, mixed with certain earths. This is really disgraceful to humanity —there are many beasts in the form of men,

MISCELLANEOUS.

The Discovery of British Gum.

If starch is roasted in an oven its nature is entirely changed; it then becomes a gum of a yellowish color, and is generally known by the term "British Gum." It is used for thickening and suspending the coloring precipitates for calico printing, it is also employed for the paste of stamps and envelopes. Starch is not soluble in water, but this gum is perfectly so. It is only thirty years since it was first discovered, and was it not for this boon conferred upon chemistry, our calicoes would cost us a trifle more than they now do. Gum arabic was the substance in general use for thickening of colors for printing on cloth, before the noted fact was brought to light that heat could make gum out of cheap starch.—The Arabic gum is very dear, and would be much dearer than it is, owing to the great quantities of calicoes produced in all parts of the civilized world, had this famous substitute for it not been discovered.

We have always entertained a belief that the discovery was made in Manchester, Eng., and we believe this is the general opinion among practical chemists. A recent article in "Dickens' Household Words," throws quite a charm over the discovery, and makes a little romance out of it. It attributes the invention to a few intemperate Irish calico printers of Chapelizod, near Dublin, and an accident seems to have been at the root of it.

A starch factory took fire, an inebriated calico printer worked hard to extinguish it, and next morning found that his clothes were covered with gum, and it was with the utmost difficulty he could get his coat on. He and four of his shop mates held a consultation, and visited the wreck of the starch factory. In the roadway, the starch, which, in a hot, calcined state, had been watered by the fire-engines the night before, was now found by them lying in soft gummy lumps. They took some of it home; they tested it in their trade; they bought starch in the chandler's shop, put it in a frying-pan, burned it to a lighter or darker brown, added water, and at last discovered themselves masters of an article, which, if not gum itself, seemed as suitable for their trade as gum-arabic, and at a fraction of the cost.

It was their own secret; and, could they have conducted their future proceedings as discreetly as they made their experiments, they might have realized fortunes, and had the merit of introducing an article of great utility—one which has assisted in making the fortunes of one of the wealthiest firms in Lancashire, (so long as they held it a secret,) and which now the government of the British empire manufacture for themselves.

The men were intemperate, and it is said they sold the secret for a mere song, to a Manchester calico printing company, which realized a fortune while they were able to keep the secret. As many attempts were made to steal it as there was to rob Whitney of his cotton gin, but a chemical secret is not easily purloined.

A few years ago there was quite an excitement in Britain about the gum employed on the letter stamps, it was reported and believed by the ignorant to be a poison, and deleterious to moisten with the tongue; to allay the excitement the whole secret of making the British Gum was made public. If this article is now made in our country it is but a short time since its manufacture was commenced, for it is only three years since some of it was made by a practical chemist in this city, who told us that he could not compete with the foreign article, and he gave it up. Poor fellow, he was an excellent practical chemist, but was unfortunate, went to California in 1849, and now sleeps with the clods of the valley there. We like those touching incidents connected with discoveries and inventions; the falling of an apple by which Newton discovered the law of gravitation, and the flying of a kite, by which Franklin proved the identity of lightning and electricity, are incidents never to be forgotten while time endures.

To Take Creases out of Velvet.

Creases may be removed from velvet by passing the underside of the velvet over a warm smoothing iron. Let one person hold the velvet tight, and another pass the iron; then spread out the garment, and brush gently yet briskly with a velvet brush.

The underside of the velvet should be moistened with a little very weak glue water. The velvet must not be laid upon a table or all the knap will be laid. It is a nice job to dress a piece of velvet.

Ostrich Feathers.

"A fashion," said a descendant of Abraham —a dealer in feathers—to us one day, "travels in circuits, and generally performs a revolution every ten or twelve years." He found out that feathers had their regular duties to perform in the fashions in about the periods stated, hence he kept a sharp look out for those of good quality during the intervals. The finest feathers, and those which are most prized, once belonged to that much maligned fowl, more valuable than a hundred shanghae barn fowl, the ostrich. The finest feathers are plucked from tame ostriches, not from wild ones, as is generally supposed. It will no doubt be useful information to some people to be informed how to clean such feathers. This is done by squeezing them with the hands in strong soapsuds and then rinsing them in clean water; this is for white plumes. After being washed they are run through a very weak solution of the sulphate of indigo, and afterwards exposed to the fumes of sulphur in a tight box, the same as is done by milliners when sulphuring straw hats. After exposure to the fumes of sulphur, they are hung upon cords to dry. To color ostrich feathers, they are tied up loosely in cotton bags, in such a way as the fibres will not be tangled, and then boiled in kettles along with the dye stuff. Scarlet can be dyed with cochineal, tartar, and the chloride of tin, in a kettle with boiling water. It takes about half an hour to color. Yellow can be colored with the chloride of tin, and yellow oak bark. Green can be colored with fustic, and the sulphate of indigo. Black can be colored with a little copperas, blue vitriol, fustic, and logwood. The fibres of these feathers are curled by drawing them over the edge of a blunt knife, between the thumb and finger; this is a secret in the art of dressing them. In those countries from which these feathers come, they are submitted to a bleaching process by the natives. They are exposed to the sun and dews for two or three weeks, and carefully washed with soap and pipe clay.

The Battle of the Bees.

A curious circumstance, says Gallignani's Messenger, occurred a few days back at Cuilleville Eureset Loire. A small farmer had in a field about two hundred and fifty bee-hives, containing a vast number of bees. He sent a man with a cart, drawn by five horses, to remove some earth from the wall near which the hives were placed. The carter having occasion to go to the farm house, tied the horses to a tree. Almost immediately after, a multitude of bees, either irritated at the shaking of their hives, or the removal of the earth from their wall, or excited by the electricity with which the atmosphere happened to be charged, issued from their hives, as if in obedience to a given signal, and with great fury attacked the horses. In an instant the poor animals were entirely covered with bees from head to foot; and even their nostrils were filled with them. When the carter returned he found one of the horses lying dead on the ground, and the others rolling about furiously. His cries attracted several persons; one of them attempted to drive away the bees, but they attacked him, and he had to plunge into the pond, and even to place his head under the water for a few seconds, in order to escape from them. The Cure of Gulliville also attempted to approach the horses, but he too was put to flight by the enraged insects. At length two fire engines were sent for, and by pumping on the bees a great number were killed on the horses, or put to flight. The horses, however, were so much injured, that they died in an hour. The value of the bees destroyed was 1,500f., and of the horses 2,500f. A few days before, bees from the same hives killed seventeen goslings.

So much for French bees.

Flat Roofs.

All the new houses which have been built in New York recently, have what are termed flat roofs; that is, the roof is nearly level and slants but slightly from one side to the other. The old huge peaked roofs are fast disappearing, we wonder how they ever came into use. The inventor of them must have been a man full of conical ideas. The flat roofs are covered with tin and well painted. If a fire takes place in a building, it is easy to walk and work on the flat roof, so as to command the fire if it be in the adjacent building, this cannot be done on peaked roofs. Flat roofs are cheaper and more convenient in every respect. We advise all those who intend to build new houses to have flat roofs on them. It is far better to have a flush story at the top of a building than a peaked cramped up garret which is only comfortable for travelling on the hands and knees.

The Woodworth Patent Bill Defeated.

All our readers know that the owners of the Woodworth Patent applied to the present Congress for an extension of the said patent, although the present grant will not expire before 1856. At one period, owing to the tremendous amount of wealth and interest, and the insiduous efforts of its promoters, we were afraid that the Bill would be passed, and the monopoly re-fastened upon our people; the danger is past, at least for the present, thanks to the Chairman of the Committee on Patents in the House of Representatives, Mr. Cartter, of Ohio. His Report, adverse to the extension of the patent, has been printed, and is now before us; it is an able document, and contains information on the subject not to be found any where else. If possible, we shall endeavor to publish it, in parts, from week to week, so as to have it all bound up in this volume of the Scientific American.

Mesmerism and Spiritual Rappings.

We have received a pamphlet, without the name of the author being attached to it, which pretends to expose the Spiritual Rappings scripturally. The author attributes the phenomenon to evil spirits; he appears to be just as sincere as the Rev. Mr. Harvey. An astrologer was arrested in our city last week, and his spirit of divination will no doubt cease. If some of those spiritual rappers who, for filthy lucre-sake, lead silly-minded persons astray, were encased within the walls of a penitentiary, to rap away at the breaking of stones for six months, all their spiritualism would soon disappear.

A New Idea in Steamships.

The Eastern Steam Navigation Company of London had proposed a plan to their shareholders for building two steamships, 700 feet long, and 14,000 tons burden, each vessel to have two sets of paddle-wheels and a screw propeller, of an aggregate power of 3,000 horses. These vessels are to run from Milford Haven to Alexandria, and from Suez to Calcutta. It is assumed they will go at the rate of 30 miles an hour, and will cost $3,500,000, or $1,750,000 each.

The Tomato.

Professor Rafinesque, of France, says of this vegetable, "it is deemed very healthy, and an invaluable article of food."

Dunglison says:—"It may be looked upon as one of the most wholesome and valuable esculents that belong to the vegetable kingdom."

A writer in the Farmer's Register says:—"It has been tried by several persons with decided success. They were afflicted with chronic cough, the primary cause of which, in one case, was supposed to be diseased liver, in another, diseased lungs. It mitigates and sometimes effectually checks a fit of coughing."

The method most commonly adopted in preparing this fruit for daily use, is to cut them in slices, and serve with salt, pepper, and vinegar as you do cucumbers.

To stew them, remove them ripe from the vines, slice up, and put them in a pot over the stove or fire, without water. Stew them slowly, and when done, put in a small piece of good butter, and eat them as you do applesauce. Some add a little flour bread, finely crumbed, or a couple of crackers pulverized.

Notes by a Practical Chemist.

PREPARATION OF BENZOIC ACID BY SUBLIMATION.—Benzoic acid, as ordinarily obtained by sublimation, is apt, in course of time, to grow yellow, from the presence of an essential oil. This may be avoided by operating as follows:—The gum benzoin, in coarse powder, is spread at the bottom of an iron vessel, then covered with a layer of animal charcoal of half a centimetre in thickness. The vessel is then tightly covered over with a sheet of porous paper, as in Mohr's process, whilst above is placed a stout paper cap which exactly fits the sides of the vessel. The whole is then exposed to a moderate heat in the sand bath.

PREPARATION OF PURE POTASSA.—The usual process is to ignite the bitartrate, wash the residue with pure water and boil the solution of carbonate of potassa thus formed with hydrate of lime in an iron vessel. The solution of hydrate of potassa is then boiled to dryness, the residue dissolved in alcohol and evaporated in silver dishes. The potassa thus prepared is usually free from sulphates and chlorides, but contains very frequently a trace of the silicate of potassa. This impurity, according to H. Wurtz, may be thus removed: An aqueous solution of the carbonate in question is evaporated to dryness in sheet-iron vessels at a sand heat, lumps of carbonate of ammonia being added from time to time.—The silicate of potassa is thus converted into carbonate, and on redissolving in water, the silicate appears in the form of flakes floating on the liquid, and may be separated by filter ation. The filtered liquid, free from silica may now be used for the preparation of pure hydrate of potassa, taking care to use lime, which is likewise free from silica.

A solution of hydrate of potassa kept in glass bottles, becomes, in course of time, impure, by taking up silica from the glass. Flint glass bottles will preserve such a solution much longer than any other. Pure silver is, however, the best material for bottles in which solution of potassa is to be preserved.—London Artizan.

Pommade de Seville.

This is a simple but efficacious preparation, much in request among Spanish ladies, for removing from the face the effects of the sun. The following is the recipe:—Take equal parts of lemon juice and white of eggs. Beat the whole together in a varnished earthen pipkin, and set on a slow fire. Stir the fluid with a wooden spoon till it has acquired the consistency of soft pomatum. Perfume it with some sweet essence, and before applying it, carefully wash the face with rice-water.

To Make Prime Vinegar.

A correspondent of the Ohio Cultivator vouches for the merit of the following recipe for making vinegar:—

"Take and mix one quart of molasses, three gallons of (rain) water, and one pint of yeast. Let it ferment and stand for four weeks, and thee will have the best of vinegar."

Pleasant Perfume and Moth Preventive.

Take of cloves, caraway seeds, nutmeg, mace, cinnamon, and Tonquin beans, of each one ounce; then add as much Florentine orris-root as will equal the other ingredients put together. Grind the whole well to powder, and then put it in bags, among your clothes, &c.

A train of cars on the Hudson River Railroad, was precipitated into the river on last saturday evening; no lives were lost, and none were severely wounded. It was a fortunate accident in this respect, for the water was 25 feet deep where the cars fell in. The blame is laid upon a switch-tender for not locking up the switch.

Quick Work.

The extensive iron works of Corning & Winslow, at South Troy, N. Y., which were burned down on the 24th of last month, have been rebuilt already, and are in operation. It takes those gentlemen to do up things as no other company in our country can. This we predicted when we gave a short account of the conflagration. All the buildings, we believe, are not finished, but the machinery is up, and the men are at work rolling and cutting.

(For the Scientific American.)

Mechanical Philosophy.

In the 28th number of the present volume of the Scientific American, Mr. Schetterly replies to what he is pleased to call a "criticism of his article on motion." Many of the shrewd allusions, groundless assumptions, and wrong conclusions, in that article, it were misspent time to notice, and would, were they noticed, be using the columns of a journal unprofitably.

The editorial remark, that "many misunderstandings arise, owing to the latitude which philosophic authors have given to terms," is correct. The confusion of scientific terms, as used by writers on mechanics, is to be regretted. What are we to understand when the term power is used? It is used synonymous with force, and as the effect of force; some apply the term to a machine that conveys force, and others to the product of the intensity of force into the space passed over, or the mass into the height raised. The word force is used with nearly as great latitude—generally to convey the idea of the effect produced instead of the cause. Force is that indescribable principle of nature, about which we know nothing, only so far as we see its effects, which impresses on matter motion or a tendency to motion.

It is perfectly correct to "prefix" different "adjectives to the noun force," to express the action of force under different circumstances, such as static, dynamic, constant, impulsive, projectile, &c. But when speaking of force in the abstract, it is not correct to say there are two or more forces, such as impulsive, constant, &c. For there is but one kind of force; nevertheless, it may act, so to speak, by pushing or pulling, and with a greater or less intensity, during a longer or shorter term of time, and through a greater or less space. To assume that one force is greater than another, because it generates a greater velocity in one second than another does in half the time, is like supposing that one man is stronger than another, because he is capable of doing more work in a day than another can do in an hour, or we might as well say that a certain horse was stronger than another, because he produced a greater mechanical effect by walking ten miles, than the other did walking one, as to say that a certain force was greater than another, because it raised a certain weight to a greater height by moving a greater distance. Writers upon mechanics were long divided in opinion as to the proper measure of forces. The difference rested entirely on the definition given to the word force. One party contended that a force should be measured by the product of the mass into its velocity, and the other that it should be into the square of its velocity. The former opinion has prevailed, and in all the higher branches of mechanics a force is measured by the velocity it is capable of generating; and the term mechanical or living force is applied to the product of the mass into the square of its velocity—or the intensity into the space passed over.

The nature of forces being known to us only by the effect which they produce, we may, with propriety, measure these effects in different ways; but to make use of the same terms to convey these different ideas, leads to confusion.

The term "force" should be applied to the cause of motion, or tendency to motion, and measured by its intensity—the force of gravity on one pound of matter near the earth's surface, for instance. The term "power" should be applied to the product of the intensity of force into the distance or space passed over—one pound of matter raised against or descending by gravity one foot, for instance. And the term "momentum" should be applied to the product of the intensity into the time—one pound of matter falling during the time of one second, for instance.

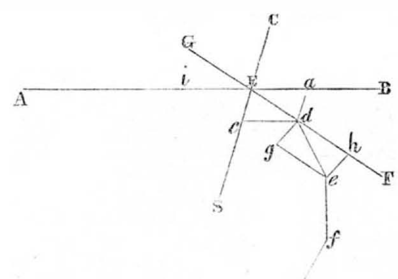
It is not at all surprising that Mr. Schetterly did not understand the "rule," "multiply the time of action by its intensity into the mass acted on, and the velocity will result." The expression $gt \div m = v$, was intended, but the pen or types were unfaithful. To illustrate:—let a mass of iron, weighing 100 lbs., fall from rest during one second of time; then $g=100$, $t=1$, and $m=100$; consequently $gt \div m = v = 1$, unit of velocity, or 32 1-6 feet. But raise the mass from the earth's surface until the intensity of gravity equals only one half of that at the earth's surface; then $g=50$, and $gt \div m = \cdot5$, equal to 16 1-12 feet. If Mr. S. will throw a perfectly flexible cord over a pulley without friction, and attach a weight of 101 lbs. to one end, and one of 99 lbs. to the other, and lets the heavier weight descend from rest during the time of ten seconds, he will have $g=101-99=2$; $t=10$ and $m=101+99=200$; or, $gt \div m = 1 = 3\cdot21$ feet per second, the velocity acquired in 10 seconds of time. By these experiments he may learn what "time of action" and "intensity" are, which, he says "are not defined by any authors in his reach." Perhaps not: but if he will open any work on the elements of mechanics, he will find that he cannot move a page in statics without having the "intensity" of force as an element in his formula. And without "the time of action" (better expressed, time elapsed during its action) he cannot move in dynamics. The force of gravity on one pound of matter, near the surface of the earth, will generate a velocity equal to 32 1-6 feet in one second of time, but in one minute its velocity will equal about 1930 feet. A force equal to that of gravity, on one pound of matter near the earth, would have given to the earth its present motion in its orbit, by having acted a sufficient length of time. So we may see the impropriety of measuring forces by the velocity they are capable of generating, without the "time of action" is considered.

Mr. Schetterly remarks, "the Latin noun *vis* (force) prefixed to the anglicised noun inertia, is, therefore, perfectly inapplicable, and excellently calculated to lead the philosopher astray." He might add, "the application of the term centrifugal force to that property of matter (inertia) by which it resists a change in its direction from a right line to a curve, has led many persons into error.

Perhaps there has not been an astronomer, from Thales down to Lieut. Maury, that did not believe and teach that the velocity of a body projected in space would be equal before being brought into a circular motion by a centripetal force, while moving in its orbit, and after it had left it at a tangent. But Mr. Schetterly appears to be of a different opinion. He says: "I proced to gratify Mr. C. by calculating the centrifugal force," &c. But does he do so? He calculates the velocity necessary for an iron ball of two tons weight to have, in order that it may become a satellite to the earth, 16½ feet above its surface. This is the whole calculation of the centrifugal force. The gravity was known before, and the assumption that its velocity would be increased by this force (gravity) if it were annihilated, is not calculation. Calculation has often proven the reverse to be the case. After getting through with his calculation, he triumphantly says: "perhaps Mr. C. may still dispute the fact (!) that of two bodies of equal weight, and impelled by the same amount and duration of force, the one in a right line and the other in an orbit, the former will move faster than the latter." Most assuredly he will; and will "jump at a conclusion," but will keep in mind the old adage learned in school some fifty years ago, "look ere you leap," and if possible will not o'erleap the immutable laws of nature. It is laid down in mechanics as a law of inertia that "a body having received an impulse, must move uniformly in a right line, if not opposed by any obstacle; for there can be no reason why the body should deviate to one side rather than the other, nor that its motion should be accelerated rather than retarded." And the action of the central force being normal to the curve described by a body in circular motion, it cannot affect its velocity; for there can be no reason why it should retard rather than accelerate it. If the central force should act in advance of the body moving in an orbit, its motion would be accelerated, if the contrary, it would be retarded. This is proven by the motions of the heavenly bodies moving in elliptical orbits. The primaries all being placed in the focii, they act in advance of the secondary, accelerating their motion all the way down from their apogee to their perigee, and retarding their motion all the way up to their apogee again.

If a primary were moved by some independent force, from one force to the other, keeping it in advance of the secondary each way, the motion of the secondary would be increased and its orbit enlarged. Perhaps here is where the error in Mr. S.'s reasoning originated. In whirling the weight around his head, the hand was kept in advance of the weight.

That a body moving in space loses none of its projectile motion by being compelled to move in a circle, is so clear, and has so often been proven, that, were it not that some persons suppose there is such an independent power as centrifugal force, it would be noticed no further. But, for their especial benefit, an illustration is given in a concise and somewhat original manner.



In the figure, let E be a projectile, moving in space from A towards B, with a certain velocity; if, when it arrives at E, it receives an impulse that would carry it from E to *c* in the time that its projectile or initial velocity would take it to *a*, then, by the principle of the parallelogram of velocities (the distance cd=Ea, and ad=Ec), it will arrive at *d* in the same time, and would continue to move on toward F in a direct line, with unvaried velocity. If, however, when it arrives at *d*, it should receive another impulse similar to that it received at E, causing it to arrive at *g*, in the time its motion would carry it to *h*, it will arrive at *e*, when a similar impulse will take it to *f*, &c., around the polygon. The problem is now reduced to proving that the distance E*d* and E*a* are equal: for if the sides, E *d*, *d e*, &c., of the polygon be considered as infinitely small, it becomes a circle, and the central forces a constant force; and if the distance E*a*=E*d*, the projectile and circular velocities are equal.

If one right line cross another, as A B does G F, the opposite angles are equal; if the radius, S E, of any circle, bissecting an angle at E, formed by the meeting of two chords, *i* E and *d*E, of equal arcs of any number of degrees of the circle, be produced to C, the angles *d*E*c* and *a*EC will necessarily be equal; for the angles G E B and A E F, bissected by S C, are equal: therefore, the distance E*d* is equal to that of E*a*. Consequently the velocity in the circle equals the projectile or initial velocity. Now if any person will prove that its velocity will be increased by leaving the circle at a tangent, Esquire Andrews' machine will go, but to do this he will have to produce some unknown independent force. J. B. Conger.

Jackson, Tenn.

[This communication was received by us nearly three months ago, but was laid aside among other papers. The question discussed is the central doctrine of Mechanical Philosophy, and should be carefully studied by every man. In respect to the velocity of a body being changed by a change of direction, Mr. Conger is perfectly orthodox.

[For the Scientific American.]

Theory and Practice.

I am a teacher, having, for my special department of instruction, all the branches of natural and experimental philosophy. In the course of nearly forty years devoted to this duty, I have accumulated a very handsome philosophical apparatus, and have paid the closest attention to the science of mechanics. Many new ideas in the arts have presented themselves to me, which I have heretofore kept to myself. Having had some leisure of late, I have selected (out of a number of things of the same sort) three topics as my present offering to the consideration of my countrymen:—The Plowshare Prow, the Bender, and the Steam Engine for our Western boats. I know very well that to ninety-nine hundredths of your readers, this statement—that I am not a mechanic by profession—will be enough to induce them to turn away with indifference from my speculations, and to pronounce me simply a visionary man.

Now, I would ask, have none but working men original ideas in the arts? Do the mechanical inventions of practical men always turn out to be of practical value? Must not every proposed improvement be judged of by its own merits, irrespective of the source from whence it comes? It is true that "reasoning *a priori*, is least of all tenable in mechanics," but the philosopher who uttered this opinion would not deprive us of all reasoning on such subjects. Many of the inventions patented carry absurdity stamped upon them; but many others, although brought out by theorists, need only to be reduced to practice to show their importance.

Practical men, who do not think highly of the theorists, should bear in mind that every invention is, in its inception, a mere visionary thing—existing only in the mind. Why then should it be hastily judged of? We theorists can do nothing without the aid of our practical matter-of-fact friends; and when they turn inventors, they too are matter-of-fancy men. The theory of a new machine, and the elaboration of all its parts to the production of the intended result, may cost far more time, research, and labor, than to reduce it to practice. Still, I am free to confess, that ordinarily it is a more arduous undertaking to reduce a new mechanical idea to successful working, than it is to investigate the philosophical principles on which it is based, and see that the proposed improvement does not violate the laws of nature. The lover of philosophy and the practical artizan, ought to be better friends, and not think of running each other down, for each needs the friendly aid of the other, and the labors of both are equally valuable. J.

[We have not yet published the article on the 'Steam Engine," but will do so soon. We hope the above remarks will be appreciated by both practical and theoretical men: theory and practice should always go joined hand in hand.—[Ed.

Music.

Messrs. Editors—I suppose you were in a hurry when you wrote the few lines on a new invention, page 322, No. 41, of your valuable paper. You say that you do not see what benefit can be derived from such invention. This makes me suppose that you are not so full of music as you are of many other of the sciences. Do you not think that a composer of music would appreciate this invention when he lets his whole soul pass through his fingers and makes the instrument bring out the expression of his feelings? He must now stop at every inspiration and set it down on paper, or he will lose it. With the said instrument he might compose the longest and most difficult piece of harmony, by letting his fingers run wild upon the ivory keys, without any interruption. Gamut.

[Our correspondent refers to the invention by which an operator will be enabled to write down every note he strikes upon the piano or organ. We did not allude, in the article spoken of, to musical composers, only to mere players of composed pieces. We see what an advantage the invention would be to a composer.

The Trial of Reaping Machines.

The Ohio Cultivator contains the Report of the Ohio State Board of Agriculture, on the trial of Reaping Machines and Mowers which took place at Springfield, Ohio, on the 30th of last month, and the 1st and 2nd of this. Twelve machines were entered for trial.—The gold medal was awarded as a first premium to Ketchum's Mowing Machine, by Howard & Co., Buffalo, N. Y., and the silver medal, as a second premium, to Hussey's machine. The gold medal, first premium, was awarded to Densmore's Reaping Machine, by Warder & Brockaw, Springfield, Ohio, and the silver medal to Hussey's, by Mintern, Allen, & Co.

Manufacture of Steel.

Prof. O. Role, F.R.S., in a lecture delivered before the Royal Institution, stated that the natives of the East Indies did not make their fine steel by mixing iron with charcoal in a crucible, as is commonly supposed, but put into the crucible, along with the iron, green wood and vegetables. They make excellent steel out of hoops and old iron which has been thrown away. He said they did their work in one half the time we did.

NEW INVENTIONS.

Improvement in the Dressing of Felt Hats.

Elijah Sturdevant, Jr., of Brookfield, Conn., has taken measures to secure a patent for a most valuable improvement in the dressing of felt hats, previous to the finishing operation. By the present process of preparing colored felt hats prior to the finishing act, they are stiffened in shellac varnish before being colored, and this stiffening has to be set and *cleared* with acids and alkalies. The felt hats so treated have to be blocked twice; they are very difficult to color; the stiffening is generally distributed unevenly throughout the hat body and they have a greyish surface, and are liable to be glazed when finishing by pressing. The improvement of Mr. Sturdevant does away with the acid and alkali processes, and the double blocking. The hats treated by the improved process look twenty five per cent. better, and can be prepared at one-half the cost, and in one-tenth of the time. The hats by the new process are stiffened after they are colored; no acid nor alkali is used at all, and the whole process is exceedingly simple and cheap, and does not require half the care, skill nor trouble of the old processes. We look upon this improvement as a very valuable one to hat manufacturers.

Tyres for Locomotive Wheels.

Charles Wright, of Lakeville, Litchfield Co., Conn., has taken measures to secure a patent for an improved mode of forming tyres for locomotive and other railroad car wheels. It consists in placing a series of rollers upon the face of a disc, which has a series of graduated circles upon it. The rollers are adjustable, and their peripheries may be brought in contact with either of the circles upon the face of the disc. The tyre, after being bent in circular form, is welded and heated, and then placed between drawing rollers and drawn around until it bears against all the adjustable rollers on the face of the disc; the tyre is then finished, corresponding in size to the circle on the face of the disc against which the adjustable rollers are placed.

Machine for Digging Potatoes.

Francis C. Schaffer, of the city of Brooklyn, has taken measures to secure a patent for an improvement in machines for digging potatoes. The machine embraces a scoop, a brush cylinder, and endless apron, connected by a movable frame, by operating which the scoop is made to enter the ground the required distance, and raise up the potatoes, which, by a cylinder having a revolving brush, the potatoes are brought forward from the scoop to the endless apron, which carries them away, and deposits them in a receptacle at the back of the frame. The machine is designed to be worked by horses; the bottom of the scoop, also the bottom of the receptacle for the potatoes, is formed of bars, to separate the dirt from the potatoes; the brush also removes the dirt, so that they are rendered very clean.

Improved Car Coupling.

R. L. Oliver, of New Haven, Conn., has taken measures to secure a patent for an improved car coupling, it consists in arranging spring slides with hooks and guides in such a manner, that when the ends of two boxes in which the above parts are placed, come together, the spring slides will be forced into the boxes and act upon the guides, which will throw the hooks into mortices in the boxes and secure the two cars together.

Jointing Boards for Roofs.

Peter Banker, of Schenectady, N. Y., has taken measures to secure a patent for an improved mode of jointing boards for roofs. He forms rebates or recesses in the upper surface of each board, which receive projections that are covered by caps with screws. The high prices of shingles, and the great amount of poor sawed ones in the market, will soon lead to their disuse entirely.

Improvement in Tyres for Wagon Wheels.

William A. Ashe, of Morrisania, near this city (New York), has taken measures to secure a patent for a very simple and excellent improvements in tyres for wagon wheels, &c. The tyre is simply formed with a bead on its under side, and there is a groove cut around on the face of the feloes to receive the head on the tyre.

Discovery in Telegraphing.

George Little, an electric telegraph engineer, has made a valuable discovery in the production of uninterrupted streams of electricity, to work telegraphs, without the use of batteries. He informed us that he had been experimenting for six years, in London, with a view to obtain this result. He has brought his working models along with him, and we have examined some of the messages which they print; they are like Bain's chemical messages. He calculates that his discovery will effect a saving of $200,000 per annum to our Telegraph Companies. He does not use platinum, mercury, nitric acid, nor sulphuric. If this invention effects such a saving, it will be hailed as a boon by all classes; for the telegraph, we believe, is far from being perfected. Perhaps it may be the means of working a line 3,000 miles long across the Atlantic; something which cannot be done with our voltaic batteries at present.

PLANEOSPHERICAL QUARTZ CRUSHER.---Figure 1.

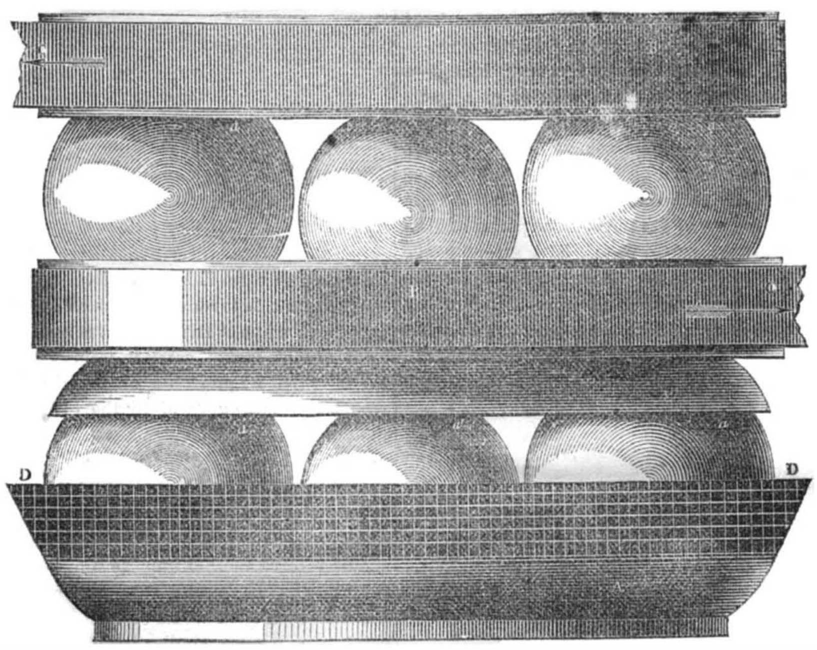
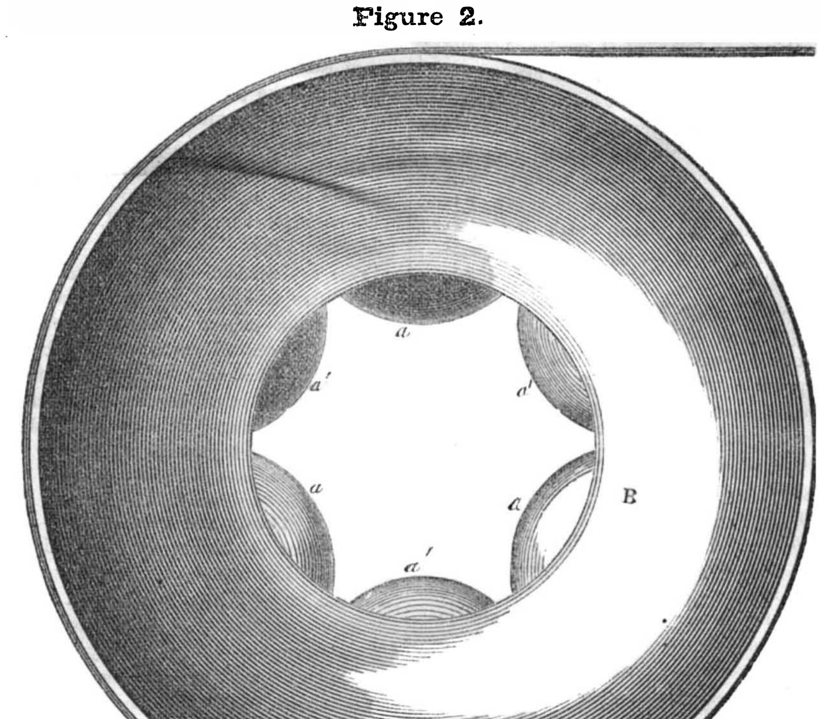


Figure 1 is a side elevation, and figure 2 is a plan view of a machine for crushing and grinding quartz and other substances, invented and patented by J. W. Cochran, of this city, a well known and successful inventor. The machine consists of a number of large cast iron balls, which are rotated in channels inside of large cast-iron basins. These figures exhibit a double set of balls, to make the quartz or other ores pass through two operations, the first or top set of balls to crush the quartz to a certain degree of fineness, in which state it falls through openings in the bottom of the top basin into the lower one, where it is ground to the utmost degree of fineness. One set of balls forms a single good machine, therefore, by leaving off the upper set, a machine is obtained which will accomplish all that may be desired by any quartz grinding company. A is the lower basin; the upper basin is formed of the cap cover, which is cast so as to answer the purpose of a belt pulley to drive the machine by the broad band, B; *a a' a*, are the balls in the basins. The belts, B B, are for driving the covers and top basin, thus giving motion to the balls in the direction of the arrows, C C; D D is a wire bolter screen; the balls in the

Figure 2.



lower basin throw off the fine ground quartz from their peripheries through the screen, and it is received on a trough of wood placed outside. The upper set of balls have a contrary motion to the lower set, and their weight assist the lower ones in grinding. Any amount of weight in the shape of rough stones, &c., can be placed in the upper plate, and instead of a belt, to drive the machine by steam or water power, recesses can be cast in the sides of the plate above the balls, for the insertion of levers to drive the machine by manual, horse, or other power. It is a most simple machine, we cannot see how it is possible for it to get out of order or wear out. The balls never can wear untrue, they have a forward motion on their axes, and a side rolling motion transverse to the forward motion. This certainly is an admirable feature in the action of the balls. There are radiating arms from the centre to keep the balls apart, or the balls, *a'*, may be less than *a*. The plate which rests on the top of the balls is concave corresponding with the stationary channelled basin, A. The machine is capable of grinding any kind of ores, and reducing them to the finest dust. Its grinding action is that of granulating the ores, not stamping and feathering out the ductile metallic gold so as to make it float away when washing, as is done by stampers. The gold is granulated to fine dust, so that the earthy and silicous matters are easily washed away and separated.

Machines of various sizes have been constructed upon this principle, and some are now in daily operation, one of which is to be seen at Waterman's ship block factory, near Peck Slip Ferry, Williamsburgh, where we have seen it in operation. One good feature about this machine is, that a large one can be operated by one, or twenty horse-power, by changing its velocity and proportioning the weight on the top of the balls. With one horse-power it is capable of grinding and crushing 300 lbs. per hour, consequently a power of 4 horse applied, will grind and crush 1,200 lbs. The ore is broken about large egg size with a hammer, and thrown in with a shovel at the top; after that it is seen emerging in the shape of a cloud of dust through the screen, D, or in fine paste if a stream of water is allowed to flow in at the top. No oil is required for lubrication, and none of the friction consumes the applied power.

Information may be obtained about the price, &c., of these machines, of E. & J Bussing & Co., 32 Cliff street. Patents have been obtained in Europe, and the American patent was issued on the 15th of last month.

Turning Irregular Forms.

Benjamin F. Jenkins and Luke L. Knights, of Barre, Mass., have taken measures to secure a patent for an improvement in machinery for turning irregular forms, such as lasts, &c. It relates to that description of lathe in which the work and cutters both revolve, and in which the irregular form is produced by the vibration of the axes of the work and of the whole or part of the cutters—the improvement consists, especially, in a simpler and more effective means in controlling the vibration of the axes, viz., that of the cutter cylinder and the carriage, by toothed wheels, one of which has teeth on a portion of its circumference only, and eccentric pins, whereby the revolutions of the carriage and the cutting cylinder, and the revolution of the work may be so controlled as to produce sections of any desired form of work, varying throughout its length.

Ventilation of Cars.

Messrs. Editors—In an article on the subject of ventilating railroad cars, in your journal of the 24th inst., you speak of the necessity of keeping the smoke from entering the car through the ventilators on the roof. My inflectors correct all matter held in suspension in the passing currents of air, and the smoke and gases are carried, by means of a syphon attached to the stack, under the train. This syphon has not yet been permanently attached, but will be the moment a full train of cars is made up. Henry M. Paine.

New York, July 23, 1852.

[To prevent the smoke from entering a *train* of cars, it will have to be conducted in tubes extending the whole length of the train. It will require to be jointed, and embrace the principle of Dr. Townsend's invention, which was illustrated on page 240, Vol. 2, Sci. Am. It might be well for Mr. Paine to correspond with Dr. Townsend on the subject, before expending much time, himself, in experiments.

Heat, Heat.

During the past week the heat has been intense in New York. A friend from Texas assured us that he was going back to Galveston to get the snap of a cold breeze. The thermometer has stood 92 in the shade. We perceive by our London exchanges that the heat has been nearly as intense there as here. A number of persons had been sun struck in London, and the thermometer was 82° in the shade. In France, too, the sun has been scorching the Parisians, and there seems to have been very warm weather all around.

Scientific American

NEW-YORK, JULY 31, 1852.

The Chemistry of Nature and Art.

The rustling of rose leaves by the wandering winds, the falling of gentle showers on beds of thyme, and the brushing of a lady's dress against the orange geranium, send forth sweet tinkling perfumes, which, although unseen by the eye, regale the senses and delight the heart. From what rich storehouse do flowers and scented shrubs draw their choice sweets; how curious must be the laboratory in which they have been distilled, how subtile the combinations, how intricate the processes; hath art done anything to compare with nature in the production of such odiferous treasures? The laboratory of a flower is a mysterious place; the most offensive matters of the stable, the offal of the streets are transformed there into the fragrance of the wall flower and the perfume of the mignonette. But art has her mysteries too, and she is also lavish with her sweets. Within a very short period, chemistry has made many discoveries in the production of artificial odors. Some of the most delicate perfumes exhibited at the World's Fair were made by chemical artifice, from cheap and otherwise offensive matters. Heretofore the scents of shrubs and flowers used by the rich, the fair, and gay, have been obtained from emulsions of those flowers and shrubs themselves. But now from the foetid fusil oil the practical chemist has obtained an ether oil which has the perfume of sweet pears: this is obtained by distilling it with sulphuric acid, acetate of lead and alcohol. Sweet scented apple oil is obtained in the same manner, only the bi-chromate of potash is employed instead of the *acetate* of lead. An oil fragrant as the pine-apple, is obtained from a soap made with butter, and distilled along with alcohol and sulphuric acid; an oil which imitates that derived from almonds, and which is so extensively used for scented soap, is made from offensive coal oil distilled along with nitric acid. Dr. Hoffman, one of the jury of chemists at the Great Exhibition was deeply impressed with the importance of these discoveries, and in a letter to Liebig he particularly directs his attention to them. The component parts for the production of pear oil, he states, are one part by measure of fusil oil, two parts of sulphuric acid, six of alcohol, and two parts of the acetate of lead. The oil of bitter almonds is quickly made by having a glass worm with two tubes, through one of which flows nitric acid, and through the other, benzole; when they meet they unite, forming the nitrate of benzole, which is the substitute for the oil of bitter almonds. The most extravagant prices have heretofore been asked and obtained for strong scented oils, their prices must soon come down to a more moderate standard.

Chemistry has demonstrated the fact, that the perfumes of flowers are but ether oils, but the flower is still the most skillful chemist, for it neither finds its acids, alkalies, fats, nor alcohol ready made; it collects them from the air, the earth, and the falling rain. This new branch of chemistry should arrest the attention of our chemists, for there can be no doubt of the fact, that an endless variety of perfumes can be obtained by the distillation of oils, fats, acids, alkalies, and alcohol together. The chemist cannot produce a single blade of grass; in the true sense of the term—although it is so named—there is no such a thing as "organic chemistry;" he only works with non-vitalic matter, but at the same time, it is certainly a triumph of science to imitate nature in any of her productions; this the chemist has done in those new productions which we have described. There are hundreds of other discoveries yet to be made—they are waiting to reward industrious and persevering experimenters.

The New Patent Law of England.

The Bill to reform the British Patent Laws has received the assent of the Queen. It alters the mode of obtaining and retaining patents in that country. A patent by the new bill is granted for the three kingdoms, and no splitting as has been the case heretofore. The government fees for the one patent will be less than for *three* patents as taken out in the old way; they will also be paid in installments of $125 for three years, after that $250 for four years, and $450 for the remaining seven years. This will enable inventors of small means to obtain patents for three years, to test their inventions, when, if they do not pay them well, they can drop the protection of the patent, by not paying the installment. More patents will now be taken out in England, and *one* patent will embrace the United Kingdoms of England, Scotland, and Ireland, together with the islands of Guernsey, Sark, and Man, and the noted town of Berwick-upon-Tweed. The mode of obtaining and prosecuting patents is but little altered. We still attend to all foreign business entrusted to our care, with fidelity and despatch.

Milk.

This liquid is secreted in special organs of the female mammalia, for the nourishment of the young, and it necessarily contains all the ingredients required for this object. It contains insoluble matter held in mechanical suspension. It is a solution of a small quantity of different salts, with a considerable proportion of sugar of milk, and a nitrogenous substance named *cheese* or *casein*. A number of small globules of fat of different sizes are suspended in it, they can only be discerned by the microscope. The salts of milk which amount to about one per cent. of the whole, are the phosphate of lime, phosphate of magnesia, phosphate of iron, chloride of potassium, chloride of sodium and soda. The soda holds the casein in solution. Pure casein is scarcely soluble in water; its combinations with the alkalies, however, are very soluble. The addition of a small quantity of acid separates the soda from the *casein*, and this makes thickened milk, the curd being no longer in solution with the alkali. Casein is the most abundant substance in the milk.

After the *casein* is precipitated there is a sugar in the remaining liquid or *whey*; this is the reason why it has a sweeter taste than even the pure milk. This is the only sugar generated in the process of animal life. It requires three parts of boiling water and twice as much cold water to dissolve it. The sugar of milk is easily converted into lactic acid; it is owing to this quality that the acidity of sour milk is due.

It has been found by experiment that a cow fed upon grass yields a greater quantity of milk than if fed upon any other food. So far as a series of regular experiments afford any data for conclusions, that kind of food which contains the greatest quantity of nitrogen, always yields the greatest quantity of milk, and the best kind of it, for it also contains the greatest quantity of butter, and this is not a little singular, for butter contains no nitrogen. It is not a good plan to feed cows on a uniform diet, for experiments have proven that the yield of milk, by such a system of diet, gradually diminishes, it is therefore a good rule to change the food of milch cows frequently.

The milk obtained from cows in the morning is generally richer than that obtained at evening. It has been found that certain pasture grounds are much better than others for the production of rich milk. We believe that this subject, of good grazing grounds, has not received that attention which it demands. There is certainly as much difference in the grass, herbs, &c., in certain pasture lands, as there is in different kinds of food.

As acid is the cause of souring milk, and as the result of it becoming acidulous is a complete separation of the casein from the other parts, it has been suggested that the addition of some alkali, such as soda or salaeratus, might render sour milk sweet. The truth is, that the addition of an extra quantity of alkali is just about as great an evil as an excess of acid. It is the perfect solution of the fatty parts of milk with the alkali in it, which imparts that fine flavor to it when newly taken from the animal. If some pearlash be dissolved in warm water, and some pure sweet olive oil be poured into it and well stirred, the liquid will become thick, white, and milky in appearance, and will also possess a flavor much like that of sweet milk.

In some parts of our country there has bene very severe droughts this summer, especially in the State of Maine. It is stated that the hay is only half a crop, and that farmers will have to sell a great deal of their stock before the winter sets in. Those of our farmers who have milch cows should use less hay for food than they now do. Cabbages, beans, linseed, barley, potatoes, and hay, should be given to every milch cow during our winter seasons at the north. These kinds of food can be varied so as to have a change every week. Every farmer should have a steaming apparatus in his barn yard; and plenty of pure air and good drinking water are as necessary as good food for the health of milch cows, and the production of a superior quantity of good milk.

Prizes for the Next Volume.

On the eighteenth of September, the first number of Volume Eight, of the Scientific American, will be issued. We look back with much pride and satisfaction to the marked evidences of favor which have been bestowed upon us and our efforts. We may be permitted to add that no journal can have more firm, steadier, or truer friends, if judgment can be formed from tangible manifestations. Our hands have been strengthened, our feelings flattered, by friendly salutations from a high-toned cotemporary press, such as no other country can boast, and from the assurances and support of a large list of cash paying subscribers. Every Volume, thus far, has closed under favorable auspices,—such as give promise of a good opening in future, and from the spontaneous manner in which subscriptions are renewed, we may almost challenge a parallel.

With a view of encouraging our readers to renewed exertions, we propose to distribute four prizes to those who may obtain the largest number of subscribers. They are of a character calculated to secure, as we believe they should, an earnest and honorable competition, and we sincerely hope our readers will be persevering and energetic in their endeavors to secure one out of the number.

The First Prize will be an elegant Silver Pitcher, an engraving of which graces our columns. It will be awarded to the individual who succeeds in obtaining for us the largest list of subscribers at our regular clubbing rates. It was designed, and will be manufactured by the firm of Wm. Gale & Son, No. 116 Fulton street, one of the best silver-ware manufactories in our country, and any article bearing their trade stamp can be relied on, unequivocally. To avoid, however, the possibility of any misunderstanding, we leave it at the option of the winner whether to accept of the pitcher or sixty dollars in cash.

For the next largest list, we shall present a complete set of the Iconographic Encyclopedia of Science, Literature, and Art; edited by J. G. Heck and Dr. Spencer F. Baird, of Dickinson College, Pa. This publication consists of four volumes of letter-press, printed on heavy callendered paper, covering two thousand pages, besides two volumes containing five hundred quarto steel plate, and upwards of twelve thousand distinct engravings. It is superbly bound, and is worth $35.

For the third largest list, we shall present "Dempsey's Machinery of the Nineteenth Century," an English work of rare utility and sterling character, now in course of publication, to be complete in ten or twelve numbers; each number contains from four to five sheets of engravings, 20 by 13 inches, drawn to scale, and executed in the highest style of the lithographic art, accompanied by a volume descriptive of each subject. It is a work of unquestioned utility to every mechanic, manufacturer, and inventor. The work is sold by H. Bailliere, 290 Broadway, for $1,50 per number.

For the next succeeding highest number, we shall award Gen. Stuart's great work upon the "Naval Dry Docks of the United States," illustrated by twenty-four fine quarto engravings on steel. This work is one of the most beautiful ever issued in our country, superbly bound in gilt morocco.

The above works are ornaments to the Scientific Literature of the world, and have been highly praised both in this and many other journals.

Here, then, our readers have something offered worth contending for—something we do not feel dishonored in offering to their intelligence, and, we dare presume, many will enter the field hoping for a prize.

In the Scientific American which will be issued the week ending December nineteenth, we shall duly announce the names of the successful competitors, and the number of subscribers sent by each.

During the week following our issue of the nineteenth December, the prizes will be distributed, or arrangements made to that effect. Names and remittences can be forwarded at any time, and a record kept of the number contained in the list. We shall open a book for the entry of each competitor's name, with the number of subscribers sent, up to the time specified for announcing the result.

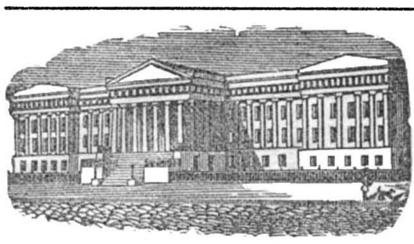
Things to be Discovered.

It is only five years since the first piece of gutta percha was introduced into our country, and it was introduced into England but a very short time before that. Nothing was known about it at all then, in comparison with what is known now. Its usefulness for many purposes is beyond calculation, for it has qualities different from all other productions, and is fitted for some purposes which no other substance can supply.

India rubber also possesses qualities, and is applied to purposes, for which there is no substitute. Liebig considers that we are vastly indebted to glass, cork, india rubber, and platina, for our modern advancement in chemical science. This is true, and we have no substitutes for these substances. We are not yet acquainted with all the useful substances in the vegetable world; we believe there are new and useful products yet to be discovered in our forests and prairies. With all the extent of country which we possess, and the vast amount of forest standing grand and dark in many of our States, pitch appears to be the only gum produced in our country, and no dye-woods but that of the yellow oak bark, is gathered for public use. India rubber and gutta percha are foreign products; gum arabic, gum shellac, gum copal, &c., are foreign products. Logwood, red wood, the best qualities of indigo, cochineal, lac—in fact about all our dyes are foreign products. Is our country, with all its varieties of climate, and soil, so barren that we have to send abroad for almost everything we need, except food, wood, and leather? We believe that too little attention has been given to our native products; we may be mistaken, but this is our opinion. Some useful discoveries of new substances may soon be made in our country, if our people, especially our planters, who are so intelligent and observing, would devote some of their time in making experiments and examinations with the object in view of adding new home products to the markets of our country.

Explosion of a Cask of Alcohol.

On last Saturday evening a cask of alcohol exploded in A. McClure's drug store, Albany, N. Y. The flame of a lamp caught the fumes of the alcohol and caused an explosion.



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JULY 20, 1852.

FIRE ENGINES—By O. G. Adkins, of Oswego, N. Y.: I claim the mode described of drawing the resistance towards the fulcrum of the lever to which the power is applied through its entire descent, thereby lengthening the long arm and shortening the short arm of the lever, substantially as described.

CAR SEATS—By Wm. L. Bass, of Cambridge, Mass.: I claim a car seat, to the bottom of which are jointed a back and leg support, the said back and leg support being placed and held at any desired angle, by arms fastened to the side arms in any desirable way, as set forth.

PLOWS—By Neri Blachly, of Windsor, N. Y.: I claim the arrangement of the beam of a plow, with respect to the irons, and the bending of the standard towards the land, and having its line of direction parallel with that of the land side, in the manner and for the purpose set forth.

MACHINES FOR SHAVING SHINGLES—By Abel Bradway, of Monson, Mass.: I claim the combination and arrangement of the yielding knives, the sliding shingle patterns, the roller, the elastic bed, the plate, and box, substantially in the manner and for the purpose set forth.

METHOD OF CONVERTING RECIPROCATING ROTARY INTO RECIPROCATING RECTILINEAR MOTION—By Alfred Carson, of New York City: I do not claim the use of pulleys, chains, and guides, for the purpose of converting rotary reciprocating into rectilinear reciprocating motion; but I claim slotting or forking the rods, and letting their two sides into grooves, in the periphery of the pulley, and connecting the rods and pulley by three chains, two of which connect with each rod on opposite sides, and pass in one direction round the pulley, and the other connects with each rod within the slot or fork, and passes in the opposite direction round the pulley, for the purpose of guiding and directing the rods, and dispensing with the ways and cross-heads, ordinarily made use of for this purpose, the several parts operating substantially as set forth.

MACHINES FOR DRESSING STONE—By Robt. Eastman, of Concord, N. H. (assignor to Capt. Seth Eastman, of Washington, D. C): I claim the within described machine for dressing stone, and for facing, reeding, fluting, and cutting mouldings upon stone, is the operating of one or more chisels or tools, by a crank or cranks, or their equivalents, which, by their continued action upon said tools, thrust or force them against the stone or other material to be worked, substantially as described.

CRUPPERS FOR HARNESS—By J. J. Flack, of Joliet, Ill.: I claim the construction of a crupper, as described, by means of which, in taming or subduing horses, the tail of the horse may be kept in a desired position, without the necessity of resorting to the painful and injurious operation of nicking or pricking, and the pulleys, and to be used for the same purpose when riding or driving the horse.

GRAIN AND GRASS HARVESTERS—By E. B. Forbush, of Buffalo, N. Y.: I claim, first, an open spaced guard finger, with an inside surface or middle finger, for the cutting tooth to cut against, substantially as described.

Second, I claim the construction of a clamp of two parts, which will hold the finger where desired, without bolts passing through the finger bar, arranged as set forth.

Third, I claim the construction of a mould board, with two upright posts, which posts pass through proper apertures in the frame of the machine, and are free to move up or down, according to the varying surface of the ground, and sustain the mouldboard forward of the cutter bar, on an angle sufficient to move the mown grass which may be forward of the finger bar, to the inside of the clamp, substantially as described.

Fourth, I claim the arrangement and combination of a right-angled stanchion, made of wood or metal, with a pivotal motion on the frame-work of the machine, and supporting upon its upright part, a crooked lever, made of wood or metal, with a pivotal motion on the said stanchion, to which lever is attached a rake; by the combination and operation of these two pivotal motions of the stanchion and lever, as set forth, a direct line motion may be given to the rake where needed, as also a circular motion, so that a person may remove the grain from the platform in bundles, and sit or stand on the machine near the driving-wheel, as described.

RAILROAD CAR BRAKES—By Wm Hall of North Adams, Mass.: I claim the combination of the sliding detached lever, with the main lever, and the connecting rods, so as to operate essentially in the manner and for the purpose as specified.

RICE HULLERS—By Clark Jacobs, of Brooklyn, N. Y.: I do not claim the use of india rubber surfaces for hulling the rice, such having been used before: but I claim the use of a vulcanized gum elastic or rubber, or its equivalent, in combination with a stone or other equivalent non-elastic rubbing surface, for hulling rice, substantially in the manner set forth.

I also claim the manner of constructing the rubber of three substances of different qualities; viz., a metallic disc, a leather disc, and gum elastic or gutta percha disc, by which firmness, elasticity, and durability are combined, substantially as described.

GRASS HARVESTERS—By J. S. & David Lake, of Smith's Landing, N. J.: We claim, first, the clearer as described.

Second, we claim coupling the wheel to the shaft, with universal joint, constructed with toggle joint arms, to admit of a vertical motion, and with gimble ring, to allow of a rolling or wabbling movement, without affecting its rotary motion, when combined and arranged for the purpose and in manner described.

GRASS HARVESTERS—By Wm. Manning, of South Trenton, N. J.: I claim suspending the cutting head and front part of the machine, whereby I dispense with front wheels, by constructing the frame as described, and attaching the cutting head to the hames of the harness, in the manner and for the purpose fully set forth.

SEWING MACHINES—By Chas Miller, of St. Louis Mo.: I claim, first, the stopping or prevention of the operation of the feed, substantially as described, when the thread breaks, or is otherwise prevented from forming a loop, by attaching the stud, or its equivalent, through which the feed lever is operated upon by the feeding cam, to a lever, the said lever being subject to be operated upon in such a manner as to withdraw the said stud or equivalent, from the operation of the cam, by a sliding piece attached to the picker, which drives the shuttle forward for filling, the said sliding piece requiring to be caught and moved by every loop, to prevent its operation in the said lever.

Second, serving or making the back stitch, by folding or bending the cloth or material, over the edge of a guide plate, or any other suitable edge, and passing each loop through the cloth or material on each side of the said bend, and each succeeding loop through, in advance of the preceding one, and half way between the two preceding perforations, substantially as set forth.

GRAIN SEPARATORS—By Cyrus Roberts, of Belville, Ill.: I claim the combination of the adjustable crank for vibrating the separating trough, with the adjustable tracks on which the jumping roller runs, which shakes the trough up and down, whereby the conveyance of the straw may be accelerated or retarded, without affecting the vertical shaking of the straw.

I also claim the adjustable angular rails, constructed and arranged in the separating trough, in the manner and for the purposes set forth.

I also claim the method described, of relieving the winnowing apparatus of a portion of the work by separating, by means of a screw, arranged substantially as set forth, such impurities as will pass through it, before the grain is delivered to the winnowing apparatus.

RAILROAD CAR BRAKES—By John Houston & Ebenezer Ross, of Manchester, N. H.: We claim the arrangement, substantially as set forth, of the levers, rods, and vertical shaft, applied to each truck of a railroad car, in combination with the method of connecting the levers by means of the links, so that if one or more of the links or bars should break, so as to render part of the brakes useless, the remainder are still serviceable for the purposes intended.

RUBBING STONE—By P. E. Royse, of New Albany, Ind.: I do not claim the separate employment of a rotary rubber, and blocking tables, as such are in common use; nor do I claim, of itself, giving the rubbers a separate motion in addition to their revolving one, by means of pinions gearing into a fixed wheel, and through cranks and connecting rods, serving to operate the rubbers, as such has before been done.

But I claim the combination of parts specified, for rubbing and polishing marble or other stone, consisting of rubbers, having, in addition to their revolving travel on the faces of the stones being rubbed or polished, a motion in and out from the centre shaft, not in a radial, but in a winding, twisting or curvilinear direction, produced by the cranks, and rods, as set forth, the said rubbers being held and so hung or connected, as that the rubbers, by their weight, will adjust themselves to the stone, without rendering it necessary to pack up the latter, and for the further advantages specified.

WATER PIPES OF TUYERES—By Peter Sweeney, of Buffalo, N. Y.: I claim the combination of the pipe, with the circulating pipe, so connected that the former may be removed from, or form a water-tight joint with the curved pipe, whereby I am enabled to blow all the water out of the latter, and at the same time to shut off the communication with the cistern, in the manner and for the purposes described.

RAILROAD CAR COUPLING—By James Turner, of East Nassau, N. Y.: I claim the transverse incline bar in combination with the coupling pin and link, the pin resting on the incline bar, and being raised clear of the link, by passing up the inclines on the said bar, as the pin moves sideways, substantially as described.

ADDITIONAL IMPROVEMENT.

METALLIC HEDDLES—By Jacob Senneff, of Philadelphia, Pa. Patented originally Jan. 13, 1852: What I claim and desire to have added to my patent, is, casting eyes of harness or heddles upon single or multiplied strands of worsted, silk, cotton, thread, or other material, in the manner and for the purpose set forth.

DESIGN.

PARLOR STOVE PLATE—By Amos Paul, of South Newmarket, N. H.

An Englishman's Opinion of Americans.

The following extract we have selected from the leader of the Illustrated London News of the 10th inst. It is so good and so true that we cannot add nor subtract a single word without spoiling it:—

"Some persons attribute all the success of the States, the good order which prevails, the general prosperity, &c., to the great abundance of land at the command of the people. But for years past the policy of our government in relation to our own colonies has been very much influenced by Mr. Wakefield's theory, that abundance of land is a source of barbarousness, and it has made land dear or scarce in the colonies, in order to confine and condense the population. It is quite certain, too, that many of the States of Europe are not so densely peopled as Massachusetts and Rhode Island. It is doubtful, therefore, whether the prosperity of the United States, and the good order of their people, mingled with strangers from all parts of the world, are the consequences merely of land being abundant.

Though material causes, of which an abundance or scarcity of land is one, have a great influence over the character of men, yet moral causes—as we learn from the examples of the Swiss, the Dutch, and the English, who achieved greatness in spite, or perhaps in consequence, of comparatively contracted limits—are at least equally powerful in determining the weal or woe of mankind.—Many parts of Russia, Poland, Austria, Hungary, Turkey, have yet room for many millions of human beings, and it is not, therefore, the command of an abundance of land, but the government, and qualities of the Americans, which ensure their prosperity. While the people of most of the countries in Europe go to logger-heads when there is any kind of difference of opinion amongst them, and could not for ages, and cannot now, elect a Bishop or Burgomaster, a Landaman, or a King, a parish beadle or a member of Parliament, without contests and conflicts, wasting money and time, generating disturbances, and breaking heads or shedding blood, the Americans, by some simple and reasonable method—caucus, log-rolling, convention—manage quietly to bring all their disputes to the decision of a numerical test. For upwards of seventy years, during most of which the old civilized States of Europe, have been convulsed with contests, insurrections, revolutions, and wars—being ruined by police, soldiers, and restrictions to prevent mischief when not engaged in bloody battle—the Americans have lived in almost perfect peace, and have continually elected throughout their States an immense mass of officials, from a hall porter to the President, without more distubance than is occasioned in Europe by changing the quarters of a regiment. The explanation of the phenomenon seems to lie in the common but general fact, that knowledge gives skill. The youngest of nations, the States, profit by the experience of their predecessors; and as they benefit by all the admirable machinery of old Europe, for cultivating the soil and manufacturing cloth, besides inventing more new and admirable machinary of their own than is possessed by any other nation except the English, so they benefit by using the best machinery of Government previously known and in use in Europe, while they have improved it by still better machinery of their own. They are simply more skilled in the art of government, as they are more skilled in the management of steam-boats and telegraphs than most of the people of Europe.

Chimneys.

In building flue chimneys, in brick walls, the inside should be plastered as carefully and smoothly as the finishing coat of a parlor. Masons do not do this; they put on the common lime used by them for jointing, and the interior surface is covered without a proper regard being paid to the functions of the chimney. The reasons for laying on the lime coat of a chimney smooth, are obvious, if we take into consideration that the rough edges of the lime, when dry, serve as points of attraction and adhesion for soot, because they resist the passage of the smoke. A smooth chimney has *a better draught*, to use a common term, than one with a rough interior; the reason of this is also obvious, because rough surfaces retard the passage of smoke, as well as water or any other substance in motion is retarded by them. In the building of houses, masons are too careless about these things; indeed, the majority of them do not appear to have any knowledge of natural philosophy, yet there is no man living, be he mason, plasterer, or hod-carrier, but stands high as a workman according as he is well informed.

Were it not for the general form of the walls of buildings, it would be much better to have the chimneys built of a round or oval shape, like the funnel of a steamboat. The flues in brick houses should be built circular inside this would be a little more troublesome, but the flues would be all the better for it; yet, if they were only plastered smooth, no one would have to complain of a square or rectangular form.

Some chimneys are built with tremendous gaping fire-places, others are built wide at the base, and taper towards the top: both plans are erroneous. A moderate width of fireplace is all that is required (we have wonderfully improved on our forefathers in this respect), and it would be far better, if a chimney is built tapering, to have the widest part at the top, where the smoke is to make its exit. A reason for this is, that when the smoke is confined below, and suddenly allowed to expand at the top, it forms a partial vacuum, which draws up the smoke. It is upon this principle that Prof. Espy's Ventilator is constructed. It may be said the open expanse above the chimney, allows the smoke to expand, therefore it is of no use to widen the top of the chimney inside; this is very true.

The rules which should be followed in the building of a chimney, is to build it of a uniform diameter from bottom to top, not too wide, and smoothly covered with plaster inside.

The object of writing this article was to direct attention to making the interior of chimneys smooth and well covered with lime. In many cases there are chimneys built for small houses, of a diameter which would enable them to carry smoke away from one of Collins' steamships. Masons do not appear to take into consideration, when they build a chimney, what it has to do, namely, to carry off the smoke from one or two fires. The narrower the chimney the better will it draw, consequently a wide chimney for a small fire—a very common error—embraces a scientific principle, as erroneous as it would be to array Tom Thumb in a suit belonging to Giant Hale, for the purpose of refrigeration in the dog-days. We have used the term draw, in respect to the current in the chimney, as it is generally understood; the principle of draught in a chimney has nothing to do with pulling or drawing the smoke: pressure, expansion, and absorption are the governing causes of aerial currents.

Diaphragm Steam Generator.

There is a description in the London Civil Engineer and Architects Journal, respecting a new steam generator, by M. Boutigny, the eminent Frenchman, who has made so many discoveries in connection with the spheroidal state of water. A description of it was given before the Institution of Civil Engineers, and to many of our readers the following condensed report will be interesting:—

The principle upon which this steam generator was based, was that "bodies evaporate only from their surfaces." This being received as an axiom, it must necessarily follow that in the construction of steam boilers, either the evaporating surface of metal should be extended to its utmost limit, or the water should be so divided, and its evaporating surfaces be so multiplied, as to arrive at the same end, of obtaining the greatest amount of steam by the expenditure of the least amount of fuel. The iron, 25 inches high by 12 5-8 inches diameter; the base terminating in a hemispherical end, and the upper part closed by a curved lid, upon which was attached the usual steam, and safety valves, feed, steam, and other pipes, &c. The interior contained a series of diaphragms of wrought iron, pierced with a number of of fine holes, and having alternately convex and concave surfaces. They were suspended by three iron rods, at given distances apart, in such a manner as not to be in contact with the heated exterior, or shell of the boiler. When any water was admitted through the feed pipe, it fell upon the upper (convex) disc, which had a tendency to spread it to the periphery, the largest quantity falling through the perforations in the shape of globules; the second diaphragm being concave, tended to direct the fluid from the circumference to the centre, and so on, until, if any fluid reached the bottom of the cylinder, it mingled with a thin film of water, in a high state of ebullition, that being the hottest part of the boiler. It appeared, however, that in its transit through these diaphragms, the water was so divided, that exposing a very large surface to the caloric, it was transformed into steam with great rapidity, and with great economy of fuel.—The boiler described had been worked for a long time at Paris with great success, giving motion to a steam engine of two horse power. The consumption of coal was stated to be very small, 789 pounds of water having been converted into steam by 182 pounds of coal in nine hours, under a pressure of ten atmospheres. The chemical part of the question was carefully examined, and it was shown, that at that temperature the iron was exactly in the best condition to bear strain. The practical application on a large scale was submitted to the engineers, the author having only proposed the system for small boilers, and under circumstances of wanting to obtain a motive power in situations of restricted space, and where first cost was a great object.

TO CORRESPONDENTS.

H. L. F., of Ill.—The engravings of your smut machine shall surely appear in the next number. We regret that we have been prevented from giving your machine earlier notice, but the crowded state of our columns would not admit of the diagrams appearing earlier.

G. W. L., of N. Y.—Your diagram for a railroad brake we have thoroughly examined, and we believe it to be new and patentable.

C. D., of Mass.—Your numbers, unless you have sufficient to complete a volume, would be of no use to us.

C. H.; of S. C.—We are aware that the first three volumes of the Sci. Am. are much sought after, but we do not think it would pay the expense to re-publish them.

W. R. B., of Ala.—Marston's breech-loading rifle, in our opinion, is the best we have seen. It is very simple.

S. F., of Pa.—We think the machines do not infringe each other. Still you might be called upon to prove the fact. We cannot tell whether an action would be commenced or not.

J. L. C., of S. C.—The machine you refer to is simple, and we should think easily managed after a little instruction. The price we do not know.

O. S. G., of N. Y.—A chain of buckets passing over drums is old and well known, and there is no chance for a patent. You are referred to Rees's Encyclopedia. Barlow's ditto, also to Nicholson's Mechanic - publications of somewhat ancient date.

J. B. C., of Tenn.—The engravings we have sent you by mail.

W. R. P., of Ohio—Dick's work is the one you want. It gives information upon grinding and polishing specula for telescopes.

D. S. M., of N. Y.—We do not discover any novelty in your Separator. Two fans have before been used, and therefore could not be claimed. B. claims the blast passages arranged and controlled by the shutter. This is all.

G. H. B., of R. Island—If, as you state, the Navy Department has decided that your invention "is entirely useless for any practical purpose," it certainly will be difficult to obtain aid in carrying it forward. We see no reason why you should wish to progress with it any further. The department ought to be capable of deciding in such a case.

H. B., of N. Y.—We do not understand what you mean in your last letter. The pressure in the boiler does not resist the heat. Although water boils at a low heat in a vacuum, the water is cold, it does not possess the same amount of heat as water under a pressure. The pressure in the cylinder varies from that of the boiler. There is no difference that we know of, in the amount of fuel consumed, under 100 lbs., pressure, and 20 lbs., to produce the same effect.

W. H. P., of Ind.—We have never known of a lathe cutting machine like the one represented in your letter of the 7th inst. The claim would be for cylinders of cutting implements, operating in combination with each other. You will need to construct a small model and send it to us.

J. T. M., of N. Y.—The exhaust steam from an engine can be used to boil tubs, &c., but it should be allowed to pass only by a coiled pipe through the vessels, to the atmosphere. It is now employed in many places in this manner.

J. W. B., of Pa.—There is nothing new in the water wheel mentioned in your letter of the 5th inst.; it is a slight modification of spiral water wheels not in common use, because less effective than those more generally employed.

F. M., of N. H.—Your sketch of an alleged improvement in propelling circular saws contains no patentable feature. It has been employed for horse-powers, and within six months a sketch of the same contrivance has been submitted to us for an opinion.

D. J. N., of Ohio—An application is always embarrassed by such action as you mention, and we should not now wish to undertake it. If any person should make and use your invention before an application is made for a patent, you could not obtain anything for such use.

C. A., of Pa.—You had better send us a model of your invention, as the sketch and description are not clear. You can make a model cheaply.

H. A., of N. H.—A fee for the "back use" of a patented article can be collected after the expiration of a patent. If you infringed a patent before its expiration you are liable.

S. F., of N. Y.—We do not know how much Mr. Putnam charges for the work upon Telegraphing. By addressing Mr. Putnam or Jones you could ascertain all the particulars.

D. B. F., of O.—An application is now pending at the Patent Office for a patent on the best article of soap we have ever used; the patent will issue soon, and you had better secure a State right if you wish to manufacture an article that will supercede your neighbor's.

Y. N., of N. Y.—It is not possible for you to obtain a patent on the plan submitted. In Vol. 1, Sci. Am., you will find substantially the same plan illustrated and described. Eames' patent issued last year is an improvement over yours.

D. F. B., of La.—A sugar apparatus you will find in Vol. 6, Sci. Am. We can never insert a communication for the accommodation of a single individual, unless it be of a character tending to interest the mass of our readers.

F. B., of Canada.—You must not expect to get 52 numbers of the Scientific American for 2 dollars as long as you reside out of the States. We are obliged to pay 1 1-2 per copy on all papers sent to Canada.

S. R. W., of S. C.—We have never known of such a combination and arrangement to produce the same results. We understand your improvement to be, that when the water is at its proper level and the engine in working order, some of the water drawn from the cistern by the pump is returned to the cistern without passing into the heater and boiler; but when the water gets below the proper line, *all* the water drawn by the pump is forced through the heater into the boiler. If we correctly understand your meaning and the mechanism as you have it arranged will operate well, we think you have a good and patentable improvement. Engravings published in the Scientific American would cost you $12.

D. P., B., of Ga.—If you will send us a model of your invention we will examine it, and advise you further respecting the prospects of a patent upon it.

G. H., of Del.—On page 404, Vol. 6, Sci. Am., you you will find diagrams of a crank indicator, patented by S. B. Hutchins, and assigned to G. S. Wormer, of Oswego, N. Y. The same principle which your invention contains exists in the one referred to.

N. C. D., of Vt—More than 5 years ago we had the same plan suggested to us.

G. V., of Iowa.—You will find complete drawings of Paine's water gas apparatus in No., 32, Vol. 6, Sci. Am.

J. R. M., of Ohio.—Such an apparatus as you describe has been used for some time in England. You could not obtain a valid patent upon it. It is called the Archimides Pulverizer.

R. S. M., of Pa.—We can judge better when we know more about it.

A. H. G., of Vt.—You had better send us a sketch and description of your alleged improvement in horse powers. It strikes us as possessing no novelty, still we cannot fully decide without a better knowledge of its construction.

F. B., of O.—In Rees's Encyclopedia, Vol. 5, of plates, you will find an optical instrument which is calculated to produce the same results as your invention and in a far superior manner we think.

Money received on account of Patent Office business for the week ending Saturday, July 25:

L. R. F., of Ga., $25; J. M., Jr., of N. Y., $30; C. A. M., of Mch, $50; R. M. W., of Pa., $30; S. T., of Mass., $30; J. & K., of Mass., $25; S. K., of Md., $20; C. G. B., of N. Y., $25; J. I., of N. Y., $30; J. G., of O., 55; P. C., of Mo., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, July 25:

A. H., of Ga.; C. A. M., of Mich.; J. H. V., of N. Y.; C. G. B., of N. Y.; J. & K., of Mass.; G. W. M., of Tenn.; R. E. L., of Ill.

Back Numbers and Volumes.

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

Of Volumes 1, 2 and 3—none.

Of Volume 4, about 20 Nos.; price 50 cts.

Of Volume 5, all but 4 numbers, price, in sheets, $1.

Of Volume 6, all; price in sheets, $2; bound, $2,75

Of Vol. 7, all back numbers at subscription price.

Patent Claims.

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

Patent Laws, and Guide to Inventors.

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.

ADVERTISEMENTS.

SCIENTIFIC MUSEUM.

Elementary Mechanics.

HUMAN STRENGTH—An active man, working to the best advantage, can raise 10 lbs. 10 feet in a second for 10 hours in the day, or 100 lbs. one foot in a second.

Absolute force of pressure with the hands was found by the dynanometer of Regnier to be on an average equal to 110 lbs. Absolute force of a man lifting with both hands 286 lbs. Greatest average load which a man can support on his shoulders, for some seconds, is estimated at 330 lbs.; and it is supposed that he can exert the same force in drawing vertically downwards.

The mean absolute force of a man, in drawing or pulling horizontally, is found by the dynanometer to be 110 lbs.; the force of the pull in the strongest man was found to be only 20 lbs. more than the average.

The greatest effect of a man's strength in raising a weight will be when the weight of the man is to that of his load as

1 : —1½, or nearly as 4 : 3.

HORSE-POWER—It is well known among engineers that a horse is capable of raising a weight of about 150 lbs. 220 feet high in a minute, and to continue exertions enabling him to do that for 8 hours a-day.

Multiplying the number of pounds by the height to which they are raised in a minute, 150×220 gives 33,000 lbs., and the power of a horse is generally expressed by a sum varying from 30,000 lbs. to 36,000 lbs. raised 1 foot high in a minute. N. B. Bolton and Watt express it by 32,000 lbs.; Woolf, by 36,000 lbs; Tredgold, Palmer, and others, by 33,333 lbs. One horse can draw horizontally as much as seven men.

In trains of machinery from 1-4 to 1-3 is allowed for friction.

TABLE OF HORSE-POWER AT DIFFERENT RATES OF SPEED.—Let us suppose 15 to represent the greatest unloaded speed, and the square of 15, or 225, to represent the greatest load which can be sustained without moving; the following table gives for each degree of speed, from 1 to 15, the corresponding load and useful effect:—

Speed,	0	1	2	3	4	5	6	7
Load,	225	196	169	144	121	100	81	64
Effect,	0	196	338	432	484	500	486	448
Speed,	8	9	10	11	12	13	14	15
Load,	49	36	25	16	9	4	1	0
Effect,	392	324	250	176	108	52	14	0

Thus, if the greatest unloaded speed of a horse be 15 miles an hour, and the greatest weight he is capable of sustaining without moving be divided into 225 equal parts, his labor will be most advantageously employed if he be loaded with 100 of those parts, and travel at the rate of 5 miles an hour. If he be thus employed it will be found that he will carry a greater weight through a distance, in a given time, than under any other circumstances.

A horse, upon a well-constructed railroad, can draw 10 tons at the rate of two miles per hour, or 5 tons 4 miles per hour.

The absolute force of the horse drawing horizontally is, on an average, 770 lbs. From various calculations it would appear, when the period of continuance is made an element in the calculation, that the power of a horse working eight hours a-day is, on an average, not more than an equivalent to that of five men working 10 hours; the most useful mode of applying a horse's power is in draught, and the worst is in carrying a load; it has been found that three men, carrying each 100 lbs., will ascend a hill with greater rapidity than one horse carrying 300. The best disposition of the traces in draught is when they are perpendicular to the collar.

When a horse is employed in moving a machine in a circular path, the diameter of this path should not be less than 25 or 30 feet; 40 feet would be better than either.

EXPERIMENTS ON THE STRENGTH OF MATERIALS.

Material.—Crushing Strength.—100	Tensile Strength.	Transverse Strength.
Wrought-iron	1,900	85·1
Cast-iron	158	19·8
Glass (plate and crown)	123	10
Stone and Marble	100	9.8

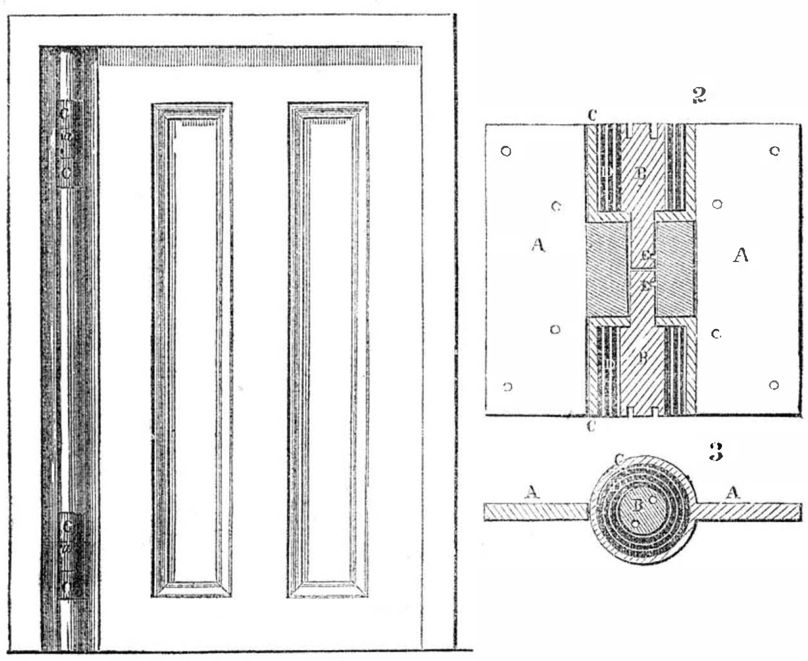
The ratio of the crushing force to the transverse force is nearly the same in glass, stone, and marble, including the hardest and softest kinds. Hence, if we know the transverse strength in any of these bodies, we may predict the other; and as glass and the hardest stones resist crushing with from seven to nine times the energy that they do being torn asunder, we may get an approximate value of the tensile force from the crushing force, or vice versa.

Medical.

CALOMEL AND SODA FOR BILIOUS COSTIVENESS.—Dr. H. Hunt, of Delevan, Wisconsin, in an article in the Boston Medical Journal, describes a new combination of medicine, to be taken as an anti-bilious pill, and which appears to be excellent for the object specified. It is composed of 1 grain of calomel, and 8 grains of the bicarbonate of soda made into pills with hard soap. It is a most excellent purgative. He has found it to operate on persons who were most difficult to move with other medicine. He first tried it upon himself in New York city. He employs it with success in Wisconsin. As an anti-bilious purge; he also gives two grains of calomel well mixed with twenty grains of bicarbonate of soda in molasses—a common dose is one grain of calomel to five of the bicarbonate of soda.

PATENT DOUBLE-ACTING SPRING HINGE.

FIG. 1.



The accompanying engravings are views of an improvement in hinges for entrance doors of houses; it was patented in the month of February, last year. The patentee was Theodore F. Englebrecht; the assignees are Messrs. Hewitt & Smith, No. Nassau street, this city.

Figure 1 is a front view of a door, to which the hinge is applied. Figure 2 is a vertical section of the hinge taken through the middle. Fig. 3 is a plan view, showing one of the coiled springs applied to the hinge. The same letters refer to like parts. The object of the invention is to make the door self-closing and double acting, by means of the hinge having springs in its interior, all hid from observation.

On figure 1, the hinge is represented applied to a door. A bead is let into the back door post, and there are two recesses, one at top and the other at bottom, cut out of the bead, to receive the hinge, which resembles, on the outside, a cylindrical box made in sections. The sections are in two parts, C C and *a*; the cylinders, or round boxes, C C, are cast in one piece with the flange, A, fig. 2. This flange is let into the bead and the door post, and secured by screws passing into the post. The left flange, fig. 2, belongs to the central box, *a*, fig. 1, and is let into the door. The interior of these cylindrical boxes, C C, represented in fig. 2, are cast with a large circular chamber—one at the top and the other at the bottom of the hinge. The central box, *a*, is also cast hollow, but the bore is of smaller diameter than the chambers in C C. The boxes, C C, however, have not an equal bore throughout, but are contracted at the inner parts, which form seats for two short pins, B B. These pins act the part of spindles, and are formed smaller near their inner ends, having shoulders to rest upon the seats or contracted parts of the largest hollow parts of C C. Two flat coiled springs, D D, are secured in the hollow boxes, C C. One end of a spring is secured to the box, C, the other end of a spring is secured in the same manner to a spindle or arbor, B, as represented in fig. 3. As the hinge is double-acting, these springs, D D, are reversed in their separate boxes; this enables them to act upon the door, to allow it to be opened outwards or inwards, and to close it when opened in either direction. In the interior, near the ends of the pins, B B, there are cut small grooves (one in each spindle), and there are little pins, E E, which pass through the middle box, *a*, to work in said grooves of the spindles, B B, so as to carry them round when the door is swung, to operate the springs, in both directions, according to the double-acting character of the hinge. When the door is swung outwards, it carries the box or middle cylindrical part, *a*, partially round; the small pin, E, acts in the groove of the spindle, B, and carries it round, and screws up the spring, D, in the top box, C; at the time this operation is being performed, the lower spring, D, being coiled in an opposite manner, does not act at all, therefore the tension is on the upper spring, which acts to close the door when the force that opened it is withdrawn. When the door is opened inwards, the same operation is performed by the lower spring, D, and this makes the door self-acting in both directions. This spring hinge can also be applied to window shutters, as well as doors; it is in our opinion a good improvement, and we have been assured, that it has received the commendation of the most eminent builders in our city.

It can be seen applied to a door at the office of Messrs. Hewitt & Smith, where more information may be obtained about it.

Zinc Yellow and Zinc Green.

A very fine zinc yellow may be obtained by pouring neutral chromate of potash into a boiling solution of chemically pure sulphate of zinc. (It is well known, that the bichromate of potash does not give any precipitate in a solution of sulphate of zinc.)—The precipitate, which is of a brilliant yellow, is washed repeatedly with distilled water, which water, after some time, becomes colored, whilst the beautiful yellow color of the chromate of zinc becomes much paler; a circumstance which appears advantageous in the application of it to the general purposes for which this color is used. By adding to it some recently precipitated Prussian blue, we obtain all the different shades of green, but the greater number of them are of a dull color, and the repeated washings weaken the shades, owing, probably to the instability of the chromate of zinc. The green color is quite as variable when a solution of zinc and sulphate of zinc is added to a solution of yellow prussiate of potash, and the neutral chromate of this base; only, it may sometimes be observed, that the green precipitate, while it is yet in suspension, becomes of a perfectly rusty yellow color, a phenomenon probably due to the formation of chromate of iron, as we know, that the solution of iron form yellow precipitates with neutral chromates of potash.

A fine green precipitate may be obtained by a solution of neutral chromate of potash with sulphate of copper; but again, this brilliant color is destroyed by washing with cold water, which always passes through of a yellow color, whilst, even from the commencement, the green precipitate becomes gradually of a blue color. Another kind of green may be prepared, by a mixture of yellow chromate of zinc with indigo carmine, (a solution of indigo, precipitated by carbonate of potash.)

Finally, we may obtain, as it is known, a fine color, by mixing indigo carmine with an aqueous extract of saffron.

A boiler exploded in the saw mill of the Miami Railroad and Dry Dock Company, Fulton, Ohio, on the 24th inst. One man was killed. The boiler was thrown in fragments to a distance of 300 yards.

Mr. S. E. Woodbridge, of Perth Amboy, N. J., offers $1,000 for picking a lock which he sells for $8, and continues the offer for two years.

LITERARY NOTICES.

MEYERS UNIVERSUM—In half monthly parts, illustrated with engravings from drawings by the first artists. Part II. volume 1, now before us, contains beautiful engravings and descriptions of "The Royal Exchange," London; "Constantine," in Africa, founded by the ancient Carthagenians; Palace and Gardens of St. Cloud, in France; and New York Bay from Staten Island Light House. A volume of this work will contain 48 plates; 12 parts, price 25 cents each part. It will form an elegant and entertaining book, deserving patronage; H. J. Meyer, 164 William street, publisher.

MAGAZINES FOR AUGUST—We are indebted to Messrs. Dewitt & Davenport for the early delivery of the magazines for the ensuing month. Graham's has several illustrations—"Bella" is exquisitely fine, done on steel; the wood cuts are well executed, and the contributions are from sterling authors. J. T. Headley's illustrated life of Gen. Jackson is the leading characteristic of Sartain's; it is an interesting feature; there are a number of pictures and several able contributions. The Ladies' National, edited by Mrs. Stephens, is a good magazine, and well conducted The number before us is well embellished and spiritedly edited.

LITTELL'S LIVING AGE.—No. 428 of this best of all our weekly periodicals containing republications of foreign articles, contains fifteen of the best and most interesting articles we have ever read. There is one article on the "Philosophy of the Shears," taken from Chambers' Journal, which is worth the whole price of the work. It is for sale by Dewitt & Davenport, this city.