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USEFUL RECEIPTS.

Oil of Roses.

It is principally the Christian inhabitants of the low countries of the Balkan, between Selimno and Carloya, as far as Philippopolis, who occupy themselves with the culture of the "Rosa centifolia provincialis." In good seasons about 400,000 meticals (one metical equals 1½ drachms) are obtained in this tract of country. 400 roses form about 1 oka, 8 okas furnish about 1 metical of oil; In bad seasons only from one hundred to two hundred thousand meticals of oil are obtained. The process followed, contrary to so many statements, is simply a distillation of the roses with water; this is performed in copper retorts, which contain about 30 okas of water and the same quantity of roses. The oil obtained varies in its properties; many places furnish an oil which solidifies more readily than others. The former is more sought after in commerce, but the more fluid oil has the finer odor. The oil is put into copper vessels, called "kunkunnas," which contain 100–1000 meticals; these, when filled, are soldered up. The rose-water, which is obtained at the same time, serves as a cosmetic, &c.

Detection of Cotton in Unbleached Linen.

A piece of the stuff to be examined is well washed with boiling water and dried, then laid in a mixture of 2 parts of dried nitrate of potash and 3 parts of ordinary sulphuric acid, and left in intimate contact with it for 8 or 10 minutes according to the strength of the fabric. After a complete washing and drying, the piece of stuff which has been changed by the nitric acid is decocted with ether, to which some alcohol is added; the more consistent the collodion thus obtained, the more cotton was there in the linen. If no cotton be in it, the etherial decoction is scarcely thickened. If it is wished to determine the quantity of cotton, it is only necessary to weigh the linen after it has been boiled with water and dried, then to proceed as above, separate the collodion obtained from the residue (which is unchanged linen), wash this well with some ether and alcohol, dry and weigh it; the loss of weight gives the quantity of cotton with tolerable accuracy.

Cheap Cough Mixture.

Take three cents worth of liquorice, and three cents worth of gum arabic, put them into a quart of warm water, simmer them till thoroughly dissolved, then add three cents worth of paragoric and a little quantity of antimonial wine. Let it cool, and sip whenever the cough is troublesome. It is pleasant, cheap, and good, and will remove a common cough from recent cold. Its cost is fifteen cents.

Gutta Percha Water Pipes.

Gutta percha pipes have been tried in Quebec by the Water Company with signal success. They bore a pressure of 105 lbs., to the square inch, and could apparently have sustained double that pressure. The brass coupling twice gave way, but not the pipes.

MACHINE FOR WASHING BOTTLES.

Figure 1.

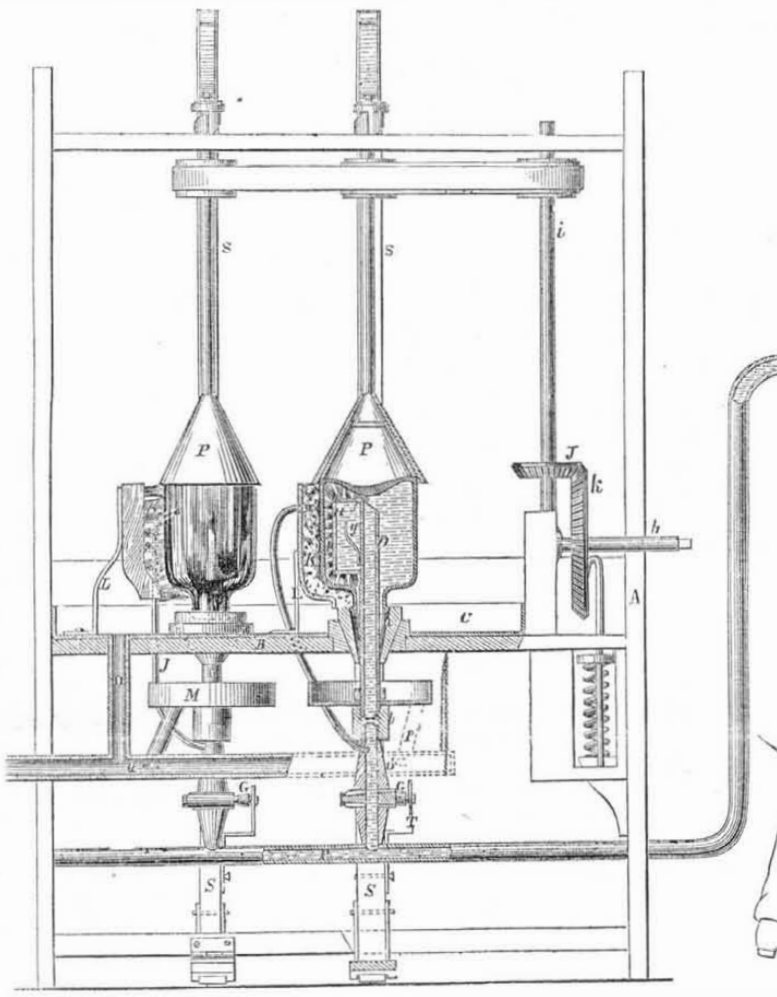
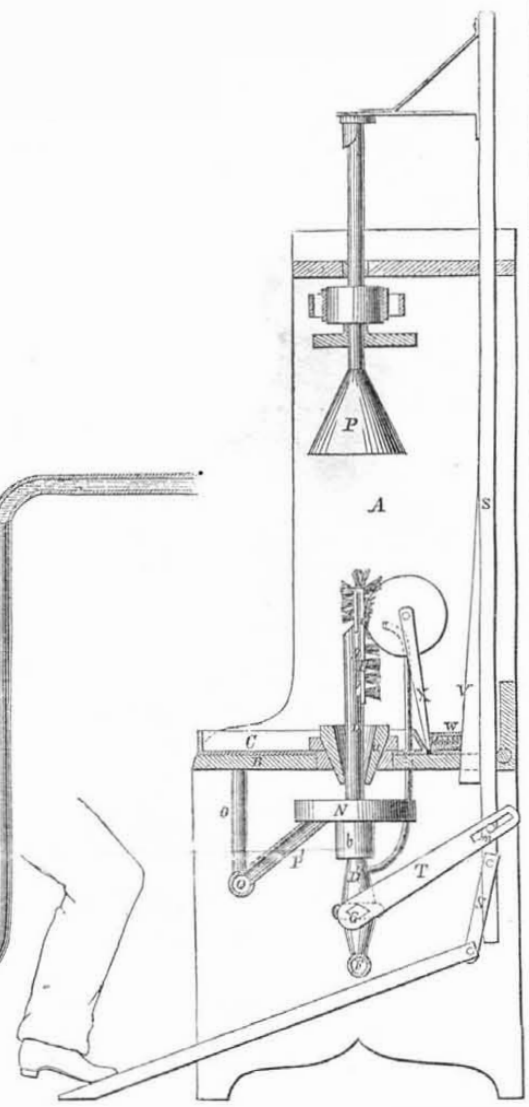


Figure 2.



The annexed engravings are views of an improved machine for cleaning bottles—inside and out—invented by A. H. Rauch, of Bethlehem, North Hampton, Co., Pa., who has taken measures to secure a patent.

Figure 1 is a front view partly in section, and figure 2 is a side view showing how the bottle holder is released. The same letters refer to like parts.

A is a stout frame made to admit as many or few stands for several bottles as may be desired; B is the table on which are placed the sockets, *a*, to receive the heads of the bottles; C is the rim of the table; D is a tube, which also answers for a fixed spindle, and to it is attached an expanding brush, H. This brush is made like a narrow rectangular frame, having flexible jointed sides, *f e*, which allow it to be folded close together as in figure 2, but when the neck of a bottle is put over the brush as shown in figure 1, the spring, *g*, expands the brush to act on the inside of the bottle as shown in the section of said figure. Each bottle is held in its place by a hollow cone, P, which is raised and lowered by the stirrup lever, S, with a fulcrum at G, as shown in figure 2. When the cones, P, clasp the bottoms of the bottles, they (the bottles) are made to rotate on their necks in sockets, *a*, by a band from the spindle, *c*, passing around pulleys on the upper ends of the spindles of the cones, P. The spindle, *i*, derives its motion from the main shaft, *h*, by the gearing, *k* J. The rotary motion given to the bottles makes the expanding brushes, H, act on the whole interior of the bottles. A pipe, F, is shown in figure 1, conveying water from a greater height than the top of the bottles: the water from the said pipe passes up the tube spindles, D D, into the bottles, throwing a jet on the bottom, (now the roof) of each bottle, and over the sides which, along with the brush, soon cleanses the interior, however dirty each bottle may be. The dirty water passes down through the neck of each bottle into a basin, N, through a pipe, P', and is discharged at the one side of the frame by pipe, Q. This is the way the interior of the bottle is cleansed.

The outside of each bottle is also washed at the same time; K is a brush or piece of sponge secured on a spring arm, L, to press against the sides of the bottle; J is a tube which carries a small jet of water from the tube, D, and plays on brush, K, so that when the bottles are revolved, the inside and outside is washed at one and the same time.—The unclean water from the outside is carried off from the table, B, by a pipe, O, which conveys it through pipe, Q, to the side of the frame. Thus we have described how the bottles are cleansed. To take out the washed bottles, and put in others to be cleansed, the holding and rotating cones, P, are raised up as shown in figure 2, when the clean bottles are pulled off their brushes and tube fixed spindles, and other bottles put on. The tube spindles, D D, are made with lower sections, D' D', so that the sections, D, can be elevated or lowered, to raise or lower the expanding brushes, H H, to adopt them to bottles of different heights. The link, nut, *b*, adjusts the said sections of tubes. G, is a cock in the short section pipe, D', for letting on and shutting off the supply of water from the main pipe, F.

In figure 1 the machine is shown at work washing bottles, the jet of water passing into the interior of each bottle, and the driving spindle of each cone, P, whirling round and carrying the bottle with it at a great velocity.

To fold the expanding brush, H, to have it ready to pass into a bottle neck at once, and simultaneously with raising cone, P, the rod, S, is of a tapering shape, as seen in figure 2, so that the treddle makes the wedge part, V, press against the coiled spring, W, and act upon the pendulous folder, X, causing its weighted end to fall against the expanding frame of the brush, H, and fold it as shown in figure 2. The brush is retained in this position, and the neck of the bottle is introduced over the upper end of said brush. The cock, G, to let in the water into the bottle and shut it off, is operated by the treddle simultaneously with elevating and lowering the cone, P, as shown by the minor lever, T, attached to the nut, G, at one end, and having a slot at the other end working on pin, *n*, of rod, S. There is also an arrangement at the side of the frame for pulling broken pieces of cork out of bottles previous to their being put in their sockets.

These arrangements and devices are adapted for cleansing bottles of different sizes in height and diameter of necks. The brush, H, may be made of other materials besides bristles, but we like them best.

This plan of washing the bottles with their necks downwards, which allows of the unclean water flowing away at once, is the correct principle for cleaning bottles by machinery or hand either.

The devices and the manner in which they are arranged in this machine exhibits much ingenuity and practical acquaintance with the business. More information may be obtained by letter addressed to the inventor.

MISCELLANEOUS.

Winds and Currents of the Sea.

In the English House of Lords, on the 26th of last month, Lord Wrottesley rose to direct the attention of the House to a correspondence between the United States' Government, Her Majesty's Government, and the Royal Society, in reference to a comprehensive scheme for improving the art of Navigation, in which the United States' Government had requested the co-operation of Her Majesty's Government. He said, the United States, sensible of the value of this plan, saw that in order to make it as effective as possible, it required to be extended. With this view they invited the co-operation of Her Majesty's Government, and the proposition was by them referred to the Royal Society to report on its merits. That learned body, by a report in the Spring of last year, spoke of the scheme in the highest terms of approval, and earnestly recommended its adoption. The British Association for the advancement of Science, by a resolution of their council, also expressed the high opinion they entertained of the merits of the scheme and of the great importance of this society; and, in order to show the value of its recommendation, he need not do more than state that since its establishment in 1831 it had raised £41,204 for scientific purposes. He alluded to the labors of Lieutenant Maury, the Director of the National Observatory at Washington, and spoke in highly complimentary terms of the scientific labor of that gentleman. It was necessary to tabulate all phenomena with the greatest possible accuracy, and he knew of no scheme better than that of Lieut. Maury for this purpose. He could not sit down without paying a tribute to the Americans, not only for originating the design in question, but for the characteristic vigor and energy which they had shown in its prosecution. He recommended the subject to the attention of Government.

Lieut. Maury has addressed a letter to Mr. Dobbin, the Secretary of the Navy, respecting the remarkable fast passage of the "Sovereign of the Seas." He says—"This noble ship made the run from the Sandwich Islands to New York, in 82 days. She passed through a part of the 'Great South Sea,' which has been seldom traversed by traders—at least I have the records of none such.

Little or nothing except what conjecture suggested, was known as to the winds in this part of the ocean. The results of my investigations elsewhere, with regard to winds and the circulation of the atmosphere, had enabled me to announce as a theoretical deduction, that the winds in the "variables" of the South Pacific would probably be found to prevail from the westward with a tradewind-like regularity. Between the parallels of 49 and 55 degrees south from the meridian of the Cape of Good Hope eastward, around to that of Cape Horn, there is no land or other disturbing agent to intercept the wind in its regular circuits; here the winds would be found blowing from the west with greater force than from the east in the tradewind region, and giving rise to that long rolling swell peculiar to those regions of the Pacific, they would enable ships steering east to make the most remarkable runs that have ever been accomplished under canvas.

The 'Sovereign of the Seas' has afforded the most beautiful illustration as to the correctness of these theoretical deductions.

Leaving Oahu for New York, via Cape Horn, 13th Feb. last, she stood to the southward through the belts, both of the notheast and the southeast trades, making a course good on the average through them, a little to the west of south. She finally got clear of them March 6th, after crossing the parallel of 45 degrees south, upon the meridian of 164 degrees west.

The 8th and 9th she was in the horse latitude weather of the Southern hemisphere.

Having crossed the parallel of 48 degrees south, she found herself on the 10th fairly within the trade-like west winds of the Southern ocean; and here commenced a succession of the most extraordinary day's runs that have ever been linked together across the ocean.

From March 9th to 31st, from the parallel of 48 degrees south in the Pacific, to 35 degrees south in the Atlantic during an interval of twenty-two days, that ship made 29 degrees of latitude, and 126 of longitude. Her shortest day's run during the interval, determined by calculation (not by log) being 150 knots. The wind, all this time, is not recorded once with easting in it; it was steady and fresh from the westward.

In these twenty-two days that ship made five thousand three hundred and ninety-one nautical miles. But that you may the more conveniently contrast her performance with that of railroad cars and river steamers, I will quote her in statute miles.

Here, then, is a ship under canvas, and with a crew, too, so short, the captain informs me, that she was but half manned, accomplishing in twenty-two days the enormous run of six thousand two hundred and forty-five miles (one-fourth the distance round the earth), and making the daily average of two hundred and eighty-three statute miles and nine-tenths. During eleven of these days, consecutively, her daily average was three hundred and fifty-four statute miles; and during four days, also, consecutively, she averaged as high as three hundred and ninety-eight and three-quarter statute miles.

From noon of one to the noon of the next day, the greatest distance was three hundred and sixty-two knots, or four hundred and nineteen miles, and the greatest rate reported by the captain is eighteen knots, or twenty-one statute miles the hour. This is pretty fair railroad speed.

There is another circumstance, however, connected with this voyage of the 'Sovereign of the Seas,' which is worthy of sttention, for it is significant, and a fact illustrative of the revolution in the ways of business which is being quietly wrought by the time-saving devices of the age. This splendid ship, after unloading her cargo in California, was sent to glean after our whalemen, and she came home with oil gathered from them at the Sandwich Islands.

This adventurous class of our fellow citizens resort there in such numbers that the fees annually paid by the government for the relief of the sick and disabled seamen there, amount to upwards of $50,000.

Now, if the Pacific Railway were built, the thousands of American seamen, and the fleets of American whale ships that annually resort to those islands for refreshment and repairs, would resort to California. There they would be in their own country; the oil would probably be sent home on railway instead of by clipper ship, and all the advantage of refitting so many ships, of treating and recruiting so many men, would inure to the benefit of our own citizens."

Unity of the Human Race.

Prof. Agassiz, in his recent course of lectures, delivered in Charleston, S. C., taught and proclaimed his disbelief in all men having discended by ordinary generation from Adam, or from one pair, or two or three pairs, of created originators of races. He believes, as we learn from the "Charleston Mercury," that not only was there an original diversity in races—in the five races, as they are sometimes termed—but that men were created in separate nations, each distinct nationality, which has played an important part in history, having had a separate origin. The Prof. says:—

"My own views on this subject differ widely from those of others who have before maintained an original diversity of races. In my opinion, not only did different races, or types of mankind, as the five races, so called, have a distinct origin, but each distinct nationality, which has played an important part in history, had a separate origin—men were created in nations.

We may trace in detail how far diversity is manifest in even less prominent shades. We will instance Spain on account of its isolation.

A Greek writer, 700 years before Christ, spoke of the fine, soft wool, brought from Spain by the Phœnicians. So the horses of Spain are mentioned as different from any known to the writer—doubtless the original stock of the Andelusian horses—as the sheep mentioned are the modern merino sheep.—These were their only domesticated animals. They had no cattle till long after.

It there was such a community of origin among men, why had each region peculiar animals? why did they not transmit the same domestic animals which they had already subdued? On the contrary, those animals are distinct as the races among whom they were found. In early times there was little intercourse between nations; there was no mixture of national character. Their means of communication were next to none. Nations made up of mingled elements are a peculiar phenomenon."

With respect to the languages of nations, the Prof. says:—"Of all the languages which have been supposed to have sprung from a common source, and diffused and changed by tradition or transmission, we are referred to the Sanscrit, the Persian, the German, the Italian, the Greek, and the Latin, and others, as constituting one family. But these as far back as their history or tradition reaches, were distinct languages. Many were spoken simultaneously. The oldest Chinese monuments exhibit the same Chinese language which is spoken to-day; so of the ancient Egyptian, the Hebrew, the old Greek, which presents the same characteristics as modern Greek—they were always within the reach of tradition separate and distinct. These cases are very similar to sets of notes characteristic of different families of animals.

How, then, arose those languages so intimately allied, as for instance, the Spanish and Italian? They evidently grew from an admixture—a foreign invasion superadded to the original stock. Modern mixed nationalities are evident examples of the process.

The Professor next argues that the further back we go in our studies of archæology the more distinct do the human races become."

Prof. Agassiz has been bearding the lion in his den, we mean the Rev. Dr. Smyth, of Charleston, who has written a very able work on the unity of the human race—the Bible doctrine of all men being descended from a single pair—Adam and Eve. This is a scientific question, which, within a few years, has created no small amount of discussion among the lovers of the natural sciences. So far as it regards the different languages of men, the arguments of Prof. Agassiz are not very strong, for all the knowledge which we have historically of the languages of different nations is dated from a period later than the record of the contusion of tongues at Babel. Communication between the nations of old was greater than he would lead us to believe; the Phœnecians came to Wales for tin long before the Christian era, and the tradition (no doubt a true one) of the Romans being descended from the Trojans, is one which completely nullifies all he has advanced about separate nations having separate created progenitors, men being created in nations. As a question of science, this one possesses a peculiar interest, and we may revert to it at some other time.

To Prevent Milk from Souring.

A correspondent of the "Ohio Farmer" gives the following plan:

"Agreeable to your request I will give you an account of our experience in the dairy business, with regard to preserving milk from becoming sour. We have kept from fifty to a hundred and fifteen cows for several years, and have milked seventy-two the past season. We strain the milk at night into a tin vat set in a wooden one, into which we pump cold water for the purpose of cooling it. Thus it is kept sweet until morning, with very little trouble, when we strain in the morning's milk, which is warmed sufficiently by heating the water in the wooden vat. Thus we proceed until Saturday night, when the milk is set and a curd made which is kept until Monday morning and made into cheese. Sunday morning the milk is strained into wooden bowls, which are painted inside and out with a thick coat of paint, smooth and hard, and set in a cool place on the cellar bottom where it keeps sweet until Monday when it is skimmed and made into cheese. The result has been that we have not lost a bowl of milk the past summer. But milk set in tin pans has sometimes soured. We formerly preserved it in tin pans by putting a piece of clean ice into each pan. The rest of the Sabbath may be enjoyed and the practice of making cheese on that day be discontinued.

Looms for Weaving Hair Cloth.

John Gledhill, of New York City, has made several improvements in looms, most of which are for weaving hair cloth, an article which has heretotore been manufactured but slowly, owing to the difficulty of introducing so many short pieces as the hair is composed of, to form cloth: several attendants were heretofore necessary to select and distribute the hairs, and at best the process was but a slow one.

By the present improvements Mr. G so constructs the power loom as to insure the making of hair cloth quite rapid, and at the same time requiring the attention of but one person to each loom. It will be difficult to give an accurate or comprehensive description of the various improvements made by the inventor in so brief a notice as this—engravings would be necessary in order to give a clear description of machinery of this character. Those acquainted with looms may, however, get a general idea of its principal improvements by the following explanation:—

The first improvement of Mr. G. relates to the lay motion, and is applicable to all power looms. It is desirable in all looms to allow as much time as possible for the passage of the shuttle or other device which carries the weft through the shed; this is more particularly the case in weaving hair cloth, as the device which takes the hair must pass through the shed or opening formed by the heddles upon the warp, and return while it is open; time may be gained for this purpose by allowing the lay or bar which brings up the threads or hair to form the cloth, to be kept back as long as possible in the widest part of the shed. An arrangement for the accomplishment of this purpose has been invented, which consists in transmitting motion from cranks upon the driving shaft to the lay. by connecting rods formed in two pieces, one being connected to the lay and the other to the crank, and both connected together by a suitable joint with a radius rod capable of working freely on a fixed centre, so that the latter part of the lay motion in retreating, and the first part of its motion in beating up, are retarded, and the lay kept longer in the wider part of the shed. The heddles in the above arrangement are not balanced by weights in the usual manner, but one leaf is made by means of pulleys to balance another next to it, and so on. Several other improvements relate to the arrangements for weaving hair cloth, which are not applicable to common looms. By means of a very ingenious contrivance the hair is taken and carried to its proper place in the cloth, the opposite ends of the hair being alternately taken, so that the cloth will not be rendered uneven by the taper. The inventor is a practical mechanical man, and we hope this improvement may tend to bring this fabric into more general use.

New Mode of Gearing Reciprocating Motion.

D. Stevens, of Leon, N. Y., has taken measures to secure a patent for an improvement in the mode of gearing reciprocating motion—no belts, pullies, or wheels of any kind are used in the arrangement invented by Mr. S., he simply uses the double toggle joint motion, and carries it past its toggle or moving centre, so as to obtain two strokes of a cross beam, or an entire revolution of a crank for each single stroke of a motor attached to the toggle joint; by this method a most effectual and simple gearing may be constructed.

Nails Growing in the Flesh.

A late writer in the "Ohio Cultivator" gives the following remedy: Cut a notch in the middle of the nail every time the nail is pared. The disposition to close the notch draws the nail up from the sides. It cured mine after I had suffered weeks with its festering.

To Cure Warts.

Warts on the hand may be cured by washing them several times a day in strong soda water, and allowing them to dry without wiping. So says a correspondent, and he is correct.

Expansion of Gases.

The expansion by heat in different forms of matter, is exceedingly various.

By being heated from 32° to 212°,

1000 cubic inches of iron become 1004
1000 " water " 1045
1000 " air " 1366

Gases are, therefore, more expansable by heat than matter in the other two conditions of liquid and solid. The reason is, that the particles of air or gas, far from being under the influence of cohesive attraction, like solids or liquids, are actuated by a powerful repulsion for each other. The addition of heat mightily enhances this repulsive tendency, and causes great dilatation.

The rate of the expansion of air and gases from increase of temperature, was long involved in considerable uncertainty. This arose from the neglect of the early experimenters to dry the air or gas upon which they operated. The presence of a little water by rising in the state of steam into the gas, on the application of heat, occasioned great and irregular expansions. But in 1801, the law of the dilitation of gases was discovered by M. Gay-Lussac, of Paris, and by Dr. Dalton, of England, independently of each other. It was discovered by these philosophers, that all gases experience the same increase in volume by the application of the same degree of heat, and that the rate of expansion continues uniform at all temperatures.

Dr. Dalton confined a small portion of dry air over mercury in a graduated tube. He then placed the whole in circumstances where it was uniformly heated up to a certain temperature, and observed the expansion. Gay-Lussac's apparatus was more complicated but calculated to give very precise results. He found that 1,000 volumes of air on being heated from 32° to 212°, became 1375, which agreed very closely with Dalton's result.—The expansion was lately corrected by Rudberg, who found that 1,000 volumes of air expand to 1365.

The still more recent and exact researches of Magnus and of Regnault, give as the expansion of air from 32° to 212 deg, 366-1000, or 11-30 of its volume at 32 deg. The dilatation for every degree of Fah. is 0·002036 (Regnault) ; or 1-491·2 part.

It follows, consequently, that air at the freezing point expands 1-491 part of its bulk for every added degree of heat on Fah.'s scale: that is—

491 cubic inches of air at 32 deg. become
492 " " 33 deg.
493 " " 34 deg., &c.

increasing one cubic inch for every degree A contraction of one cubic inch occurs for every degree below 32 degrees.

491 cubic inches of air at 32 deg. become
490 " " 31 deg.
489 " " 30 deg.
488 " " 29 deg., &c.

We can easily deduce, from this law, the expansion which a certain volume of gas at a given temperature will undergo, by heating it up to any particular temperature; or the contraction that will result from cooling. Air at the temperature of freezing water, has its volume doubled when heated 491 degrees, and when heated 982 degrees, or twice as intensely, its volume is tripled, which is the effect of a low red heat.

A slight deviation from exact uniformity in the expansion of different gases was established by the rigorous experiments of both Magnus (Ann. de Chim. &c. 3 ser. t. 4, p. 330; et t. 6, p. 363) and Regnault (ibid. t. 4, p. 5; et t. 6, p. 370). The more easily liquefied gases, which exhibit a sensible departure from the law of Mariotte, are more expansible by heat than air, as will appear by the following table:—

Expansion upon 1 volume from 32 to 212 degs.	Regnault.	Magnus.
Atmospheric air	0·36650	0·366508
Hydrogen	0·36678	0·365659
Carbonic acid	0·36866	0·269087
Sulphurous acid	0·36696	0·385618
Nitrogen	0·36682	
Nitrous oxide	0·36763	
Carbonic oxide	0·36667	
Cyanogen	0·36821	
Hydrochloric acid	0·36812	

The expansion is also found to be sensibly greater when the gas is in a compressed than when in a rare state; and the results above strictly apply only to the gases under the atmospheric pressure.

Effect of Alkalies on the Human System.

Messrs. Editors—Dr. Montague appears to be greatly alarmed lest the use of soda water, so called, and unfermented bread should injure the health of the community. His statements of the physiological and chemical nature and changes of the substances referred to, are so vague and mistaken that I am not surprised he should entertain this opinion.

He speaks of the effervescing drink sold as soda water as containing soda, whereas there is not a particle of soda used in the manufacture of it; the effervescence being produced by the escape of carbonic acid gas, which has been forced into pure water, the gas itself being obtained from carbonate of lime by means of sulphuric acid. I suppose the doctor's patients, whose stomachs were in a state of morbid sensibility, must have imbibed something stronger than soda water. He also thinks that bi-carb. soda, tart. acid, cream tartar, &c., used to raise bread, cake, &c., must produce the same lamentable consequences on the system, and he further accuses these substances of producing acetous fermentation, when mixed with flour. Here again he is very unfortunate in his statement of facts, for, after a very large experience on this point, I have never known this prepared flour to turn sour even in the most trying summer weather. He is equally at fault in his philosophy of the process of fermentation; this he describes as the union of moisture with the gluten of the flour; now the acid in flour is not formed from any of the particles composing the gluten, but from the sugar and starch, the gluten being transformed into an entirely different substance.

Our knowledge of the changes which our food undergoes in the system is not extensive, but we do know the changes which take place in the substances alluded to; when bi-carb. soda and tart. acid are mixed with flour, on the addition of water and heat the bi-carb. soda is decomposed, the carbonic acid escaping in the form of gas, raises the dough, the soda, uniting with the tart. acid, forms tartrate of soda; this is taken into the stomach with the bread, and in passing through the system, is again decomposed; its tartaric acid disappears, and by the addition of oxygen is converted into carbonic and water, the soda passing out of the system in the urine as a carbonate.

Thus it is evident there is no alkali to injure the gastric juice or stimulate the stomach to morbid sensibility, consequently the doctor's fears are utterly unfounded. It can scarcely be necessary to say that the class of acids to which cream tartar belongs, do not produce the injuries which the doctor specifies, for the experience of mankind is unusual that grapes, apples, &c., which contain large quantities of these acids, are wholesome fruit.

Newark, N. J. C. Dowden.

[Dr. Montague's letter appeared on page 267; he made no personal allusions, and employed no offensive language; if he entertains wrong opinions, our present correspondent's letter does not exhibit the proper spirit which should characterize a man anxious to do good, by correcting errors in others.

In respect to the so-called "soda water," sold as a summer beverage, our present correspondent is right regarding its composition, but Dr. Montague is right respecting its effect. "Its frequent repetition as a beverage," in a case within the compass of our own observation, completely destroyed the health, by injuring the stomach of a once healthy man; but Dr. M. stated that soda water, as an effervescing mixture, it taken in moderate quantities, might be useful in correcting acidity of the stomach.

Dr. M. did not say that *true fermentation* was produced by the union of moisture and an alkali with the gluten of flour. The sugar, which is never absent from true fermentation, is a product from the starch itself; it is not found in pure flour. In the manufacture of starch, a small quantity of lactic acid is produced in the steeping of the grain; this unites with the gluten and sets the starch free; alkalies are employed to produce the same effect. The vegetable fibrine in the gluten of flour is rendered soluble by alkaline liquors, and is very prone to decompose but we do not see how it is possible that such small quantities of acid, bi-carbonate of soda, and sugar, as are used in flour for quick fermentation, can be injurious to the stomach. At the same time Dr. Montague, may, in his experience, have reasons for thinking otherwise. Carbon, we know, forms a prominent part of the food of man, but it would not do to feed upon it. A correct knowledge of the best foods and drinks, beneficial and injurious to man, can only be obtained by experience. Wines are not reckoned healthy until they have deposited their bi-tartrate of soda, on the sides of the vessels in which they are contained. What is called "unfermented wine," is not wine at all.

(For the Scientific American.)

Silvering Mirrors.

I beg the privilege of offering your readers a few remarks, in reply to an article in your journal of the 25th of April, on the subject of "Silvering Glass."

The remarks by my excellent friend, the editor of the "Prattsville Advocate," and which you kindly transferred to your columns, are emphatically true. He testified of what he had seen, and they say, in this age, that "seeing is believing." Since then I have greatly improved the process in its application to large surfaces; and when I again visit the city I shall be happy to show you a reflecting surface, in which Mr. Editor, publisher, and all hands may see exactly what manner of men they are.

You refer to other inventors of processes for coating glass with pure silver. With all those processes I am perfectly familiar, having repeatedly tried them all, but always with the evidence resulting that they were impracticable on several accounts. So they have been regarded by those in Europe who purchased the rights, and the attempts to work them on a large scale have been abandoned. My process, on the contrary, is eminently practical on a scale of any magnitude: I mean that I can silver the largest glass manufactured, in a few minutes, most beautifully and completely, and that it will ever after remain pure and spotless; and that I can do this any desirable number of times with much greater certainty than usually attaches to chemical processes. My process is wholly unlike the others referred to, excepting that I use "pure silver," a circumstance which in no way affects my originality, for this much-loved article is not patentable, I imagine.

To your intimation that I am "exceedingly fortunate," and "most lucky," in making wonderful discoveries, I plead guilty. My entire time is devoted to scientific pursuits, and it is but fair that I should occasionally get a peep behind the curtain. Allow me to say that these pursuits are mostly connected with my discovery in heliochromy, and that the latter is not neglected, but will be forthcoming hereafter. This is a perplexing pursuit; but I have mastered its greatest difficulties, and shall be able to present the world a process which, in its completed state, will be easily worked, and surpassingly beautiful in its results. L. L. Hill.

Westkill, Greene Co., May 5, 1853.

[We would much rather know the process than see the mirror. We have always understood that the silvering of glass on any scale, with pure silver, was quite successful in Europe. We trust that Mr. Hill's discovery will greatly advance the art; if it is superior to the old plans it will soon supersede them. Of course we cannot form an opinion *pro* or *con*, until we know what it is.—Ed.

Circular Saws.

Messrs. Editors—Being an engineer, millwright and machinist, I am an interested reader of your able, high-minded, and interesting paper. I find it assumes to be no more than what it really is, a record of science and truth, and a fearless advocate of correct principles and valuable improvements. I am with you in exposing those apparent improvements which are founded on imaginary theories, and those which are equally as fallacious which are founded upon incorrect estimates and experiments. By this course your journal becomes a valuable instructor and a check to the wild ambition of some of the inventors and engineers of the present age. Some fearless guide—some correct standard—is needed as a beacon to warn the public against adopting too hastily the conclusions of many so-called scientific men.

I have been engaged for some time in putting up steam engines and circular saws, and I have taken the liberty to suggest an idea or two in relation to them; those I have constructed are of the kind manufactured by Hoe & Co. A great amount of time and money has been expended to bring these saws to perfection, and those who have seen them in operation will acknowledge that they are not exceeded by any in use. It is true that the same sized saw will not cut as wide plank as one without a shaft, and constructed after the manner of some of those lately patented, but in point of economy they must be quite superior; many difficulties will, I think, suggest themselves in the use of the saws without a shaft or spindle. There is too much machinery and what is used is not applied to advantage—the saw is too liable to bend, too liable to get out of repair, and does not work with the force and strength of a common circular saw; a fifty-four inch circular saw constructed after the plan of those manufactured by Hoe & Co.—(and I set no value upon those saws above others equally as efficacious)—will run six hundred revolutions per minute, cutting three-quarters of an inch to each revolution. It must, in order to accomplish this result, be put up in mechanical style, and furnished with the requisite amount of power and attention. No water is required to keep it cool when running at this rate. E. A. F.

Oyster and Clam Shell Manures.

J. H. Salisbury, State Chemist, New York, has, in the "Plow, Loom and Anvil," presented an analysis of oyster and clam shells, to which the attention of our farmers, near our coasts, should be specially directed.

"The common clam shell (Venus mercenaria)—100 parts of the dry unburned shell gave of

Silica	none.
Phosphates of iron, lime, and magnesia	1·250
Carbonate of lime	69·204
Sulphate of lime	0·815
Lime, probably combined with organic matter	13·907
Magnesia	1·400
Potassa	1·847
Chloride of sodium	6·101
Organic matter	6·050
	100·614

Shell of the common oyster (Ostrea borealis)—100 parts of the fresh shell, deprived of water, gave of

Phosphate of iron, lime, and mrgnesia	0·842
Carbonate of lime	86·203
Sulphates of lime	2·061
Lime, probably combined with organic matter	6·036
Magnesia	0·338
Potassa	0·191
Soda and chloride of sodium	0·690
Organic	3·613
	99·613

From these analyses it will be seen that the shells of the clam contain a much larger percentage of phosphates, magnesia, potassa, and soda, than those of the oyster, while the latter are much the richest in lime and sulphuric acid.

Soils, containing already a sufficient quantity of lime for present demands, and where the object is merely to compensate for the gradual waste, shells unburned may answer quite as good a purpose as those which have been burned. When used before burning, owing to their compact texture, they are acted upon but slowly by the ordinary agents to which they are subjected, and hence it requires a much larger quantity of them than of burned shells to exert, in a given time, the same degree of influence upon the soil. Unburned, their effects are not materially different—throwing aside the small quantity of animal matter and soluble salts they contain—from ordinary limestones broken equally fine and disposed of in a similar manner.

A locomotive engine factory has been established at Pittsburg, Pa., with a capital of $150,000. The shares are $5,000 each.

NEW INVENTIONS.

An Improved Valve Cock.

An improvement in the above has been invented by John Griffith, of Philadelphia, Pa. The valve cock possesses advantages over the plug cock in its lightness, and the facility with which the valve is ground tight; as at present constructed, it is frequently in practice very imperfect. It is usual to make the screw, by which the valve is opened and closed on the valve stem, and unless every part is very perfectly constructed, this will cause one side of the valve to close sooner or bear in its seat harder than the other parts, which will be liable to bend the stem, and this difficulty is attended with worse consequences when the valve has a broad bearing. The object of this invention is to provide a remedy for the above difficulties, by making the valve with a cylindrical stem, passing through a hollow stem, which forms part of the body of the cock, and is furnished outside with a screw, to which is fitted a nut. This nut carries a yoke, in which the valve stem is capable of turning freely but not of moving longitudinally. By turning the nut the valve is raised and lowered from and to its seat, in a right line; the valve being always kept in such a position that it will fall truly into its seat and close perfectly when the valve stem is turned. The inventor has taken measures to secure his invention by patent.

Improvement in Hot-Air Furnaces and Ventilators.

The method of operating the wings or ventilators of hot-air registers, has heretofore been attended with some inconveniences that appear to be obviated by a very simple contrivance invented by S. T. Munson, of New York City. The nature of his invention consists in having the wings of the register attached at one end to a slide by means of bent arms, the outer ends of which fit loosely in apertures in the sides, said arms being secured to the wings at points some distance from the centres. The slide is operated by means of a lever having a slot in it, through which slot a small projection from the slide passes. By operating the lever, motion is given the slide, and the wings are operated or cleared according to the direction in which the lever is moved. An impetus is given the lever as it is moved by means of a spring placed at its lower end. The spring also prevents the casual movement of the lever. Measures are taken to secure a patent.

Ornamental Letters for Door Plates.

C. L. Osborne, of New York City, has taken measures to secure a patent for an improvement in articles of this description. The nature of the invention consists in a novel combination of stained glass, with mirrors, for the purpose of representing, with a peculiar effect, letters, figures, and ornamental devices suitable for door-plates, signs, and similar articles. The stained glass employed is of that description which is only stained on one surface, and on this stained surface is engraved such letters, figures, or other devices as are desired, to such a depth as to remove the stain entirely from the glass; behind the glass so engraved is then placed a mirror. The effect produced is, that when the plate is viewed in any position except that perpendicular to the line of vision, the reflection of the devices engraved is seen on the mirror through the colored part of the glass, which appears illuminated, and the reflection of the colored portion of the glass is seen through the colorless or engraved portion, and presents a very peculiar and beautiful appearance.

Manufacture of Steel.

A gentleman of this city, Geo. Nimmo, has shown us some very good specimens of steel which he manufactures by a peculiar process from scrips of old wrought-iron and steel. Mr. Nimmo has prepared a flux which he uses in smelting the iron and steel which he says gives to the mixture the quality of good cast steele; this flux probably also imparts a portion of its substance to the iron. The discovery may prove to be of value to manufacturers, as the process is very simple, and the ingredients used are not expensive. The discoverer, Mr. Nimmo, has taken measures to secure a patent.

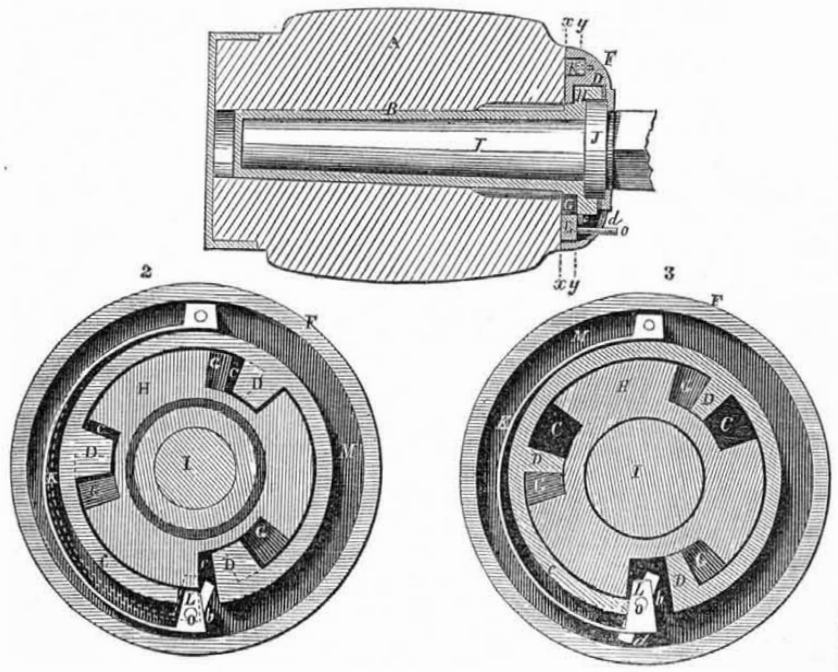
G. W. FINK'S IMPROVED WAGON HUB.

The improvement in Wagon Hubs represented by the annexed engravings, was invented by G. W. Fink, of Circleville, Ohio, for which he has taken measures to secure a patent. The hub is composed of wood with a metallic centre, in which the axle turns; it works freely and nice, is kept lubricated without difficulty, and is at the same time kept entirely free from dust and dirt, the axle being fastened at the inside of the hub.

Figure 1 is a vertical longitudinal section through the centre; fig. 2 is a transverse section through the line $x\ x$, and fig. 3 is a transverse section through the line, $y\ y$, of fig. 1. The same letters refer to like parts in all the figures.

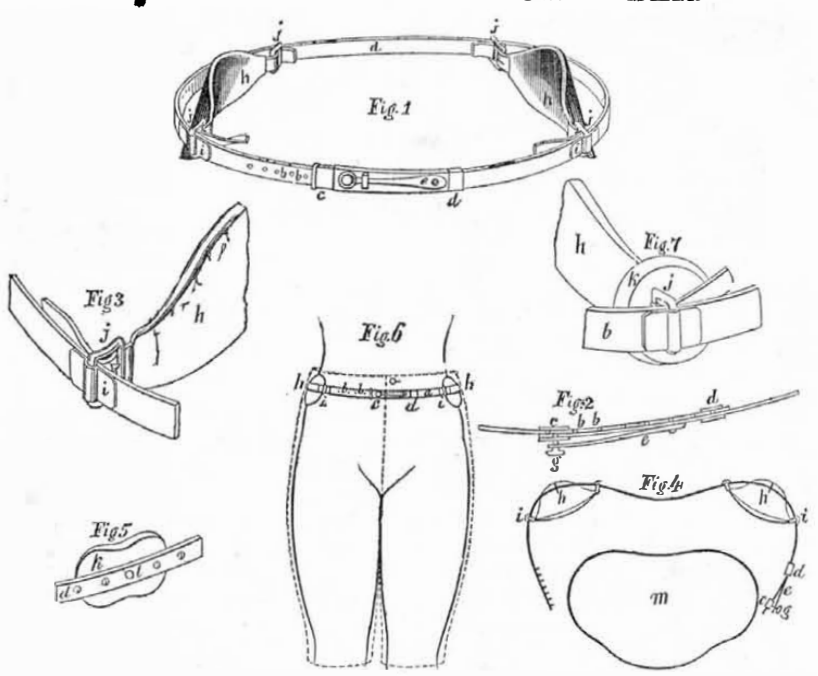
I is the axle, represented within the hub, A, which has the metallic centre, B, provided with feathers upon each side to prevent its turning in the hub; it projects beyond A on the inside, at H, over which projecting part a circular grooved movable cap, F, is fitted, meeting the inside of the hub. The axle passes through this cap until it meets the collar

Figure 1.



which surrounds the axle, and is stationary upon it, being packed with the cap to prevent the escape of the lubricating oil. The cap, F, is then made fast to the stationary projection, H, in the following very convenient manner, in order to prevent the wheel from sliding from the hub:—M is a groove or channel cut in the cap, F, for the purpose of receiving the circular spring, K, which is made fast to the cap at one end, and has the pointed catch or key, L, upon the other end. The circular flange or projection, H, is removed at $c\ c$, being cut away for the reception of the lugs, D, cast within the cap, F, in the form represented in figs. 1 and 2. These lugs are chiselled upon the inner side next the cap, so as to form a shoulder, G, under which a portion of the circular flange or projection, H, slides when it is desired to lock the axle to the hub, which is done by turning the cap, F, until the key, L, of the spring, K, passes down between one of the lugs, D, and a section of the broken collar or projection, H. When it is desired to remove the wheel from the axle it is effected by raising the spring by means of a pin, o, passing through a slot, $b\ d$. The outer end of the hub is closed, as shown in fig. 1 in the cap, F. This is a very neat arrangement and forms a good hub. Further information may be obtained by addressing the inventor.

IMPROVED ENCIRCLING SUSPENDER.



The annexed engravings represent an invention patented by H. H. Tinker, of New London, Conn., on the third day of December, 1851. The object of the improvement is for the purpose of supporting the pantaloons or other garments by an encircling suspender passing around the human body. It may be used by males or females, and will be found to be quite easy and convenient.

Figure 1 is a perspective view of the encircling suspender or spring. Fig. 2 is a section of the front of the spring, showing the manner in which it is clasped together. Fig. 3 is a section of the spring representing the manner of attaching the pads. Fig. 4 is a top view of the suspender, showing the method of passing it round the body. Fig. 5 represents the pad attached to the spring by a single pivot, which is sometimes used instead of the pads, $h\ h$. Fig. 6 shows one of the suspenders fitted upon the body; and fig. 7 represents a small pad surrounding the buckle. In fig. 1 the spring is represented with the ends lapping one on the other. Two or more bands are attached to the spring, as shown at $c\ d$, or having a space or loop on the inside to receive the other end of the spring, which, being passed through these spaces, the bands, c and d, form clasps or bracelets to guide and retain the connection of the two ends of the spring. A pin g, in spring, e, passing through the belt, d, at either end of the openings, $b\ b$, for the purpose of attaching the parts of the band together and adjusting them suitably for the wearer; $h\ h$ are buck-skin pads or straps to rest upon the hips of the wearer; they are attached to the bands or belts of the plate, i; by buckle, j, or the pad may be a cushioned metallic plate, (as shown at k, fig. 5), attached to the belt by a centre pin, which may vibrate to accommodate the pad to the different motions of the body—a small movable pad encircles each buckle to make them easy to the wearer. m, fig. 4, represents a sectien of the human body, the ends of the belt being separated in the act of being put on or taken off. In fig. 6 the belt or suspender is represented in its proper position upon the wearer, having the pads, $h\ h$, resting upon the hips, and the dotted lines represent the garments provided with hooks, loops, or other suitable device to attach them to the suspender. The advantages of this invention are, that the weight of the garments are sustained on the hips instead of being suspended upon the shoulders, thus relieving the vertebral column. These belts may supersede the necessity of abdominal supporters, being adjustable, covered with kid or other suitable material, and well fitted to the human form; they may be underlaid with cotton or other soft substance, so as to make them agreeable to the touch, and be locked as loosely around the body as is thought proper, at the same time adjusting the pads, h, to the hips as closely as is thought best, this also gives liberty for the chest to expand more freely than when encased by the common suspender.

More information may be obtained by letter addressed to the inventor at Pendleton Hill, Ct.

New Steam Valve.

Notwithstanding the great variety of valves patented and in use in our country, there are few good ones yet brought before the public. Two impoatant desiderata in the construction of valves, are, simplicity and want of friction. Several accomplish the latter object at the expense of the former, and some the former at the expense of the latter. A valve has been lately invented by Jarrett Megaw, of Wilmington, Del., which is intended to avoid the friction occasioned by the pressure of steam upon it, and is, at the same time, a very simple structure. The arrangement of Mr. Megaw is substantially the following:—a conical cup is surrounded by a band, both being perforated for the admission of steam, the band is fitted to the cup and turns steam-tight upon it. As the steam is let into the steam chest it presses equally upon the opposite sides of the band and also of the cup, thus one side is made to counterbalance the other. Measures are taken to secure a patent.

Improved Dental Instrument.

F. Davidson, of Liberty, Va., has invented an instrument for removing the saliva from the mouth during dental operations, particularly in filling teeth. The manner in which Mr. Davidson accomplishes the object is by placing small tubes within the mouth to absorb or take up the saliva, which is thus conveyed by other tubes to a small cylinder or napkin placed upon the lap or by the side of the patient.—The saliva is absorbed or sucked up from the mouth by a small pump working within the cylinder, which may be operated by the subject or by another person standing by his side. Dentists are well aware of the difficulty often experienced in filling the lower teeth on account of the accumulation of saliva; sponges and astringent drugs are employed to remedy the inconvenience, but they are generally employed without success. The tubes are said to effect the object in a very desirable manner. The inventor has taken measures to secure his invention by patent.

The Atlantic steamship arrived at this port on last Saturday, having made the shortest passage this season, viz., nine days and twenty-two hours. This is the fastest passage the Atlantic ever made.

Scientific American

NEW-YORK, MAY 21, 1853.

Coal—Our Black Diamonds.

There was a time when a moral, brave, and industrious people could become a powerful nation independant of climate and natural resources of country, but this, we believe, cannot occur again. Men are indeed animated by the same passions that swayed mankind in the days of the Pharaohs and Cæsars, but the nations of the earth are now controlled by outward circumstances of a totally different character, and these have but recently come into existence. The invention of the steam engine and the application of its mighty power to manufacturing and commercial purposes, have made those nations the rulers of the world which have within themselves the greatest resources for maintaining the all conquering agency of *steam*. Commerce is President of Nations, and Coal is his Secretary of State.—With only a superficial area of 81,500 square miles of country, and a climate by no means favorable for agricultural productions, what would Britain be without her valuable 9,000 miles of coal fields? Without this where would be her ten thousand woolen and cotton manufactories; where her two thousand steamships and boats, and where her innumerable railroads and locomotives? Echo answers, where. The coal fields of the United States embrace an area of 133,569 square miles; those of Great Britain and Ireland, only 11,859; those of Spain 3,408; France, 1,719. With the exception of the British North American Colonies, which have a coal area of 18,000 square miles, the coal fields of all the other nations, in comparison with those of the United States, are mere *patches* on this globe. Two thirds of the commerce of the world is carried on by the United States and Great Britain, and as no nation can be commercially powerful now without steamships, and as no long sea voyages can be maintained without coal, the coal resources of our country form a well grounded basis on which to predict the future greatness and power of our Republic. Hitherto our forests have afforded an abundance of fuel for every want, and while we have used about 4,000,000 tons of coal per annum, Great Britain has been using for a number of years more than 32,000,000 of tons; France has been consuming 4,141,617 tons; Belgium 4,960,077 tons, and Prussia 3,500,000 tons. The great amount of coal used by England indicates her commercial and manufacturing power, in comparison with the other nations of Europe, but such a comparison with the United States, would not be correct, owing to our great resources of timber fuel. We have been informed, on good authority, however, that since we commenced to build and run ocean steamers, a few years ago, the demand for coal has increased so rapidly that no less than 17,000,000 of tons, it is believed, will be consumed per annum, within two years from the present date. Two lines of steamships—8 vessels—running between New York and Liverpool, used no less than 32,200 tons last year themselves. We ought to be grateful that the resources of our country can meet every demand for coal, even to 100,000,000 tons per annum for thousands of years to come. The time has now arrived when the quantity of coal used by a nation, may be taken as an exponent of its power—its commercial greatness, ocean and inland.

The invention of railroads has extinguished the difficulties of transporting our coal to the remotest parts of our country where no such fuel exists, and such places otherwise uninhabitable, may be rendered cheerful and gladsome in the coldest nights of our dreary winters. In some places where silence and solitude now reign, the hopper, the spindle, the shuttle, and saw, will soon dance by the agency of coal to the music of steam.

Our country is not only favored by Providence with twelve times more coal area than any other country, but with every valuable variety of it, such as anthracite, cannel, and bituminous of every description. It is a singular fact that although our anthracite coal fields do not form the two-hundredth part of our coal area, that nearly twice as much of this coal should be used as any of the bituminous kinds. It is also not a little singular that our bituminous coals are almost unknown and but little used in our Atlantic cities. In Great Britain no person burns anthracite for domestic use; the reverse has been the rule in New York. Within the past year, however, the good qualities of some of our bituminous coals have attracted much attention, especially those are that called the "Cumberland coals." This coal is excellent for domestic purposes, making a cheerful and warm fire, very durable, and so excellent for raising steam, that they are preferred by some steamship companies to all others. Having looked over the Report of W. R. Johnson, on the coals of the United States, we find that he estimates them highly. The demand for them has increased to such an extent lately, that 700 tons per day are now brought (we have been told) from the mines by a single company in this city. We could do without the gold of California, for it does not add a single real comfort to the life of man, but we could not do without our coals. The Koh-i-Noor diamond is valued at $2,500,000—a sum which could purchase 500,000 tons of coal. If this diamond was dropt into the depths of the sea and lost forever, no one in the world would suffer for a single useful article the less, but if 500,000 tons of coals were prevented from coming to New York City this summer, 200,000 people would be reduced to a state of intense suffering during the next winter. Coals then, are the real diamonds of our country.

The Plutonists—Heat of the Earth.

A year ago last winter, Prof. Guyot delivered a course of lectures in this city, purporting to be at the request of a number of orthodox ministers and others, in which he inculcated the nebular hypothesis, which involves the igneous hypothesis, or central heat of the earth. We took occasion at the time to point out the want of sufficient evidence to make out a case for this hypothesis, and even pointed out facts which completely nullified it.—During the past winter, Prof. Olmstead of Yale College, delivered a course of lectures in this city, in which he inculcated the very views we had expressed in this respect, he said "he had differed with his brethren of the profession" The nebular hypothesis consists in this, that at one time the whole of the materials of which the bodies of the solar system—sun, planets, and satelites—are composed, were originally in a nebulous state—a thin gas, and that by gravitation and rotation, through a number of ages, planets were consolidated, rings thrown off, and the world formed. This hypothesis is accepted for truth by the majority of astronomers, although it has not a rag to support it.

Prof. Olmstead, in speaking of the nebular hypothesis said, "If the nebular theory were true, why should there not be rings existing between the planets. There was a space of nearly one thousand million of miles intervening between Neptune and Uranus; why not then, rings between them, thrown out from the nebulous mass by the centrifugal force, when the entire mass is undergoing process of condensation? Again, it was claimed for this theory that the nearer we approached the sun, the greater became the density of the matter. But that was not true, for Uranus was denser than Jupiter, the earth than Venus, and the sun was only one-half the density of the earth."

The nebular hypothesis embraces the "igneous theory," as it is called, namely, that this earth is not yet cooled from its original molten state, that its interior is a hot mass, and that we live on a very thin crust. Hot springs and volcanoes are attributed to this cause, and with a strong degree of plausibility. David Mushet, however, one of the best practical and scientific mineralogists in the world, has lately published a letter in the "London Mining Journal," in which he dissents entirely from the views of the Plutonists, and overwhelms them with ridicule. He says:—

"The uniform cleavage of the fundamental crust in the direction of the magnetic poles was recorded long since by Humboldt, Sedgwick, and other observers, and suggested to them to hope that such a fact might lead to the discovery of some great natural law.—Now, had this great natural law, when discovered, been compatible with the igneous dreams, could it have been engrafted and bound into the existing volumes of philosophers, it would, no doubt, have been readily received; but, unfortunately, the law of nature annihilated the law of man, therefore, man must continue to teach error, and the law of nature and truth be put to silence.—The inveterate determination to discover volcanic agencies has formerly as much blinded observation as it now blinds conviction. In Sir Charles Lyell's first edition, where he records with eminent candor and *naivete* his fruitless diappointment in searching out centres of eruption in Sicily, he relates facts which might have pointed to the truth, but for the engrossing prejudice of ascribing the trifling undulations of the earth's surface to the furious caprice of subterranean fire.

He refers to the columnar arrangement of ice in the northern regions of perpetual frost (a striking instance of the magnetic action) without explaining the phenomenon by the fusion or eruption of the ice in the state of lava, as the similar basaltic columns have been theorized to be formed. The masses of the earth, as much as the crystals that are included in them, are the subject and the product, not of convulsive throes, but of regular definite laws; and here, as everywhere else, the magnetic or electric fluid is the physical governor of the world."

Here we have a strong advocate of the magnetic theory, viz., that the mighty agent which produces and has produced so many changes in our globe, is electricity, and certainly we must say we are surprised that any person of common sense can look upon the face of a granite quarry and believe, (as every Plutonist must) that what he sees there is due to the arrangement of a vitreous mass, while he entertains no such belief respecting a free stone quarry.

Events of the Week.

Soda for Incrustations in Boilers.—We have received a letter from one of our subscribers in Royalton, Oldham, Lancashire, Eng., who informs us that soda is not a preventative of incrustations in steam boilers. It indeed precipitates the lime in the water, but that is just the thing which should be avoided as it falls down and attaches itself to the bottom of the boiler. His brother ruined in a short time, a good steam boiler by the use of soda to prevent incrustations. He suggests an acid instead of an alkali to hold the lime of the water in solution in the boiler. We must say, however, that no known acid in combination with the lime, will hold it in solution in the boiler. The two will form a salt, which will fall to the bottom, such as the sulphate of lime if sulphuric acid is used.

Kentucky Mechanics' Institute.—This new Institute, established in Louisville, has published the circular for its first annual fair. It is to be held in the month of October next. We hope the mechanics of Louisville will have a good fair. We understand they build the finest steamboats on the Mississippi; such is the reputation they have here.

Water Power at Niagara Falls.—We see it stated in a number of our exchanges, that a hydraulic canal at Niagara Falls, is about to be commenced, for factory purposes we suppose. It is stated that a company is formed for the object with a capital of $500-000. The canal is to be nearly a mile long, seven feet wide, and ten feet deep, cut through the solid rock. It will form the finest water privileges for factories in the world, but we are not so sure about the sites for buildings—they cannot be built at the bottom of the falls.

Black and Fair Hair.—There is rather an amusing article on "Human Hair," in the late number of the "London Quarterly Review." In Europe the fairest haired inhabitants are found north of the parallel of 48°. Between 48° and 45° parallel, there is a debatable land of dark brown hair, and to the tropics the races are generally black haired. There are exceptions, however, to these lines, as the Venetians have been distinguished for golden hair, while in Ireland the Celts have been distinguished for black hair. In America, however, among the Anglo Saxon races, very fair people are found in the pine woods of the Southern States.

The difference of color in the hair is owing to the tint of the fluid which fills the hollow tube in each hair. This fluid has been analyzed by Liebig, and the result shows "that the beautiful golden hair owes its brightness to an excess of sulphur and oxygen with a deficiency of carbon, whilst black hair owes its jetty aspect to an excess of carbon and a deficiency of sulphur and oxygen." Few, perhaps, have ever bestowed a thought upon the number of hairs in the human head. A German, it seems, has applied himself to the task of counting them, and gives us the result of his labors:—"In a blond one, he found 140,-040 hairs; in a brown, 109,440; in a black, 102,962; and in e red one, 88,740."

The red appears to be the coarsest, and yet we find silky and coarse fair haired people, and some have red hair of a beautiful soft, silky and wavy appearance, while others have it as coarse as wire and as bright as a brick.

Atmospheric Telegraph.—We have received a letter from a Baltimore correspondent, who speaks disparagingly of the atmospheric telegraph of Mr. Richardson, which was illustrated two weeks ago in our columns. He wonders how men of science can advocate it, as "the packages in the tube cannot be sent away faster than the air pump works, which exhausts the tube." This is true, but the difference is, that the air pump may be kept working constantly, while packages need not be sent but two or three times per day. He speaks of a locomotive being as fast, and a much better way to send packages. Well, we have no doubt but a small locomotive and an air line of lilliputian railway would answer to carry packages if the plan could be carried out. A locomotive must stand idle when it is not working, but the atmospheric telegraph engine may be kept working day and night accumulating a force for the rapid transportation of a package, when it is to be sent. We hope the plan of Mr. R. will be successful, although we know there are many practical difficulties in the way, nothing but mechanical ones, however.

The London Illustrated News and the Scientific American.

Scarcely a day passes but we notice clippings and cuttings from our columns by publications which think proper to borrow without informing their readers that the loan was obtained through the Scientific American. In taking up the "Illustrated London News," for April 24, two large engraving were presented to our view, of Improvements in Railroad Cars. The transfer was a *fac simile*, but no reference was made to their having appeared in the Scientific American nearly two years ago; it was referred to as a good specimen of railroad cars in America,—and indeed it was such at the time it appeared; but the "News" should be apprised that two years is sufficient to effect an entire revolution in the mechanical character of a country like the United States. The form, design, structure, and mechanical arrangement of a large portion of our improvements, particularly those pertaining to locomotion, are undergoing great changes, and if the "News" would present a fair contrast between American and English locomotive cars, they should come down to the present age, and not deal in the things that were.

The Lords are Coming.

By the late news from Europe, we learn that the Earl of Ellesmere is appointed a Commissioner from England to the Crystal Palace Exhibition, in this city. Sir Charles Lyell, the eminent geologist, and Sir Henry de la Beche, the celebrated chemist are also coming. Well, we hope these men will be received by our *sensible* people as they deserve. They are distinguished for learning and scientific attainments.

A beautiful small locomotive engine is to be sent out with the Japan expedition. It will have all its accompanyments of tender and carriage, and a railroad of some length to match. It is intended to astonish the Emperor of Japan, as it is a perfect working model and will be in the charge of a competent engineer from Philadelphia.

Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MAY 10, 1853

COUNTERSINKS—By A. G. Bachelder, of Lowell, Mass.: I claim an independent countersink, so constructed that it may be used on different sized bits, or other instruments for boring, for the purpose of countersinking, as well as gauging the depth of the hole at the same time it is bored, as described.

PUMP VALVES—By Nehemiah Dodge, of New York City: I claim an arched valve, formed by passing two planes, inclined to each other, through a semi-cylinder of the same diameter with the bore of the pump, the sectional valve thus formed being hinged by one vertex, to the interior of the bore, for the purpose set forth.

WASHING MACHINES—By E. L. Evans, of Hartford, Ct.: I claim the combination of the rubber and rod or handle, for the opening or closing said rubbers by the same handle with which the rubbing is performed.

I also claim the combination of the rubbers E with the rubbers F, and bars, so that the two pairs of rubbers shall, each of them, grasp the cloth and rub it between them, as described.

INVALID LOCOMOTIVE CHAIRS—By T. S Minniss, of Meadville, Pa.: I claim the combination of the wheel, axle, and shank on the end of the projecting arm, by which a central support is given to the frame within the disc of the wheel, the bearing in the hub being central with the bearing of the rim, permitting a free lateral movement to the wheel, without changing its point of support to the frame, and enabling the wheel to receive any shock on its rim, with firmness, while its plain surface is left unobstructed from the free movements of the crank and handle.

Also, the arrangement of the adjustable handle, which can be used to pull the chair, or as a guide in the hands of the invalid, when pushed by another, or changed to a crank of various length of stroke, to suit the invalid, when he wishes to propel himself with his own hands. The materials used, in the construction of said machine, being wood, iron, or other material, as convenience or fancy may dictate.

DITCHING MACHINE—By J. W. Morrill, of Hampton Falls, N H.: I claim, first, the employment of the swinging cutters, in combination with the swinging spade, the whole being constructed, arranged and operated, as set forth.

Second, I also claim the combination of the swinging cutter, swinging spade, and lever, the whole being arrarged in the manner specified.

[See engraving and description of this machine on page 12, Vol. 8, Sci. Am.]

FASTENING LEATHER BELTINGS—By Enoch Osgood, of Bangor, Me.: I claim the application of the tapering screws, with hooks and eyes screwed into the edges or ends of leather or belting, for the purpose of uniting the edges together, as described.

REGISTERING APPARATUS FOR PRINTING PRESSES—By J. W. Richards, of Hoboken, N. J: I claim, first, the circular slotted plate let in flush with the face of the feed board, and fitted so that it can be rotated, to bring its radial slot into any desired position, to pass the registering point, as described.

Second, the spindle and arm connected to and combined with the circular slotted plate, so as to slide vertically, when actuated by competent mechanical means, and project the point through the slot in the plate, as specified.

MACHINE FOR MAKING WROUGHT IRON—By J. P. Sherwood, of Fort Edward, N. Y.: I claim the combination of a revolving cam drum, with the converging die stocks, moving in directions oblique to the axis, on which the cam drum revolves, the cams being constructed, as set forth, with two curved faces meeting at an angle, the whole arrangement being such, that dies moving at right angles to each other are operated by a single drum, without the intervention of rods or levers.

Also, the compound gauge and nipper which acts as a gauge to regulate the breadth of the nail blank, and also as a nipper, to hold it firmly, during the action of the pointng die, the same operating as described.

OPERATING AND CONTROLLING THE RUDDER OF STEAM VESSELS—By F. E. Sickels, of New York City: I claim operating and controlling the rudder of a vessel, by combining with the steersman's handle and the rudder, with an engine so arranged as to move or hold it, with and against the force of the propelling engine, as described.

HOOK HEADED SPIKES—By J. H. Snyder, of Troy, N. Y.: I claim rolling wedge-pointed spikes between rotating dies, so formed that the face of one shall be the reverse of one face of the spike, when formed, and the face of the other die, to correspond, in the relation with the other face of the spike, as specified.

I also claim forming hook heads on spikes, by rolling from the point towards the head, to force the surplus metal towards the head, and then bending and giving the form required, by a lip on one of the dies, projecting beyond its face, so that it shall have an increased motion, by reason of its greater radius, to give the required form, as described.

Also, in combination with the dies for rolling the shank of the spike, making the heading lip, for forming the head, movable, by forming the said lip on the end of a bar, adapted to slide in the stock of the die, as specified.

Also, in combination with the rotating dies, the employment of the sliding cutter and carrier, as specified, for cutting from a rod the required lengths of rod, and carrying thereto the rotating dies, as specified.

And, finally, I claim, in combination with the rotating dies, the slides, for presenting and forcing the end of the rod into the rotating dies, to insure the proper position of the rod in the dies, as specified, for if the rod be not griped by the dies at the proper time, there will be either too much or too little metal for the forming of the head.

MANUFACTURING MALLEABLE IRON DIRECTLY FROM THE ORE—By G. A. Whipple, of Newark, N. J: I claim forcing down upon the iron ore, from the roof of the furnace, in the different stages of the process, as required, and on the different hearths, atmospheric air, either heated or cold, for the purpose of decarbonizing the ore, and bringing the iron to nature or refining the same, and regulating the degree of heat, in the manner and for the purpose specified.

LOCOMOTIVE ENGINES—By D. Winder, of Xenia, Ohio: I claim the employment of three engines, connected with a three throw crank on the driving shaft, with the cranks arranged at equal distances apart on the circle, as specified, when this is combined with the employment of valves, stop cocks, or their equivalents, for letting the steam on both ends, or cutting it off from one end, to work the engines, on the single or double-acting principle, as specified.

PAINT COMPOUNDS—By C. F. Sibbald, of Philadelphia, Pa. Patented in England, Oct 15, 1852: I claim the compound of tallow, plumbago, and charcoal, as set forth.

KNITTING LOOMS—By J. Mee, of Lowell, Mass. (assignor to J. Mee & John Rourke, of Lowell, Mass., & Gilbert Mackennon, of Portsmouth, N. H.): I claim the two sets of thread guides, in combination with two sets of needles, or their equivalents, and machinery for casting the loops, the whole being made to operate together, as specified, not meaning to claim the invention of a single set of thread guides in combination with two sets of needles, and machinery for casting the loops, as such is not new, but meaning to claim the invention of two sets of thread guides, in combination with two sets of needles, and machinery for casting the loops, as described, and operating together, to produce a ribbed knit fabric, as explained.

Also, causing the two sets of needles to work or move up or down, independently of each other, or in other words, so that one set may move downwards, or be moved out of the way of the thread guides, to be brought into operation on the other set, such improvement enabling me to bring or arrange the two sets of needles close together, and thus make closer work than can be produced when the two sets of needles are made to move in one direction (either up or down) at the same time.

WARP NET FABRICS—By John Mee, of Lowell, Mass. (assignor to John Mee & John Rourke, of Lowell, Mass., & Gilbert Mackennon, of Portsmouth, N. H.:) I claim the new or improved manufacture of warp knit ribbed fabric, the same being made by means of two sets of hooks or needles, and two sets of warps or warp yarns, laid and looped together, and upon the said hooks or needles, as specified, and whether to exhibit ribs to equal or unequal widths on opposite sides of the fabric, as explained.

TONGUING, GROOVING, AND MOULDING CUTTERS—By J. M. Patton & W. F. Fergus (assignor to J. C. Da Costa), of Philadelphia, Pa: We claim arranging the cutting teeth on the periphery of a plate, inclined to the axis of its rotation, so that as they are rotated they shall correspond in reverse to the tongue and groove or moulding, to be formed thereby in the manner described.

PRINTING PRESSES—By James Young (assignor to J. W. Middleton), of Philadelphia, Pa. Ante-dated Nov. 10, 1852: I claim, first, the combination and arrangement of mechanism for operating the inking rollers, as described.

Second, a false bed hinged to a stationary one, and the mode of fastening the form to the bed, as described.

Third, I claim the eccentric in combination with the platen, by means of which the latter can be adjusted while in metion, or thrown off, for the purpose specified.

DESIGNS.

COOKING STOVE—By S. H. Sailor (assignor to J. G. Abbott & A. Lawrence), of Philadelphia, Pa.

COOKING STOVE—By Julius Holzer, of Spring Garden, Pa, assignor to J. G. Abbott & A. Lawrence, of Philadelphia, Pa.

COOKING STOVE—By E. F. Robinson, of Boston, Mass.

Patent Case.

SLITTING MACHINERY—U. S. Circuit Court, New York; Judge Nelson presiding—T. B. Tappan against P. Ernst, for the intringement of a patent granted to Pearson Crosby, Nov. 3, 1841, and re-issued March 10, 1849, for improvements in the machine for re-sawing boards and other timber. The defendant alleged that his machines, commonly known as the Wells' machine, were no infringement of Crosby's patent. That Wells has a patent for his machine, &c.: that the defendant had done but very little work with his machines since the re-issue of Crosby's patent. The Jury, under the charge of the Court, found a verdict for the plaintiff for $350. This case was decided on the 9th inst.

The Brain.

At a recent sitting of the French Academy of Sciences, it was attempted to demonstrate by a learned academician, from various careful experiments on the brains of animals, that the motive power of the respiratory mechanism, the vital point of the nervous system, is not bigger than the size of a pin's head.

In a paper in the "Monthly Journal of Medical Science," for March, 1853, Dr. Alex. Smith, of her Majesty's 32nd regiment, shows that the probable cause of the epidemic cholic, which afflicted the troops on the Island of Ceylon, during the past year, was the lead, which could be distinctly traced in the arrack and sugar which formed part of the supplies.

Dr. Spurgin, in his "Six Lectures on Materia Medica, and its relation to the Animal Economy," suggests that a most frequent application of therapeutical agents, in the gaseous form, by inhalation, in the way that we use chloroform, might be made available in very many diseases.

Scientific Apologists for the Caloric Engine.

As stated by us last week, the editor of a magazine professedly devoted to science and engineering, has come out in an editorial endorsing all the claims of those who state that a definite and small quantity of heat can produce an infinite amount of mechanical power, by using the same heat over and over again. We do not mention the name of the editor because we believe he is sincere but defecfective in sound doctrine. He says, "There is a fundamental principle involved in the regenerator of Ericsson and Stirling, which, could it be employed without drawbacks or losses, would allow *one ounce* of coal per day to pump out the Niagara River and keep it dry. The principle is the transfer of heat from the outgoing to the incoming medium—the successive transfers of heat from a highly expansive medium to one which is less so and back again. Many practical men oppose this doctrine and contend that the losses by obstructing the passages are equal to the gain. This is a mistake. There is no fixed relation between these quantities at all, the loss by bad contrivances may be greater than the gain, or it may be less. Suppose a certain quantity of air, of iron, and of heat enclosed in a vessel, from which none could escape; if the quantum of heat could be first concentrated in the metal, then diffused in the air, then again in the metal, and so continually changed, would not the pressure on the inside of the vessel change with each transfer of heat and would not a piston fitting in an open end and properly balanced, be alternately driven out and in with a certain degree of force and without any escape of heat. This *principle*, theoretically, is able to multiply the present effect of heat to an indefinite extent. The principle of transferring heat from the outgoing to the incoming medium, is actually employed in the steam engines every day, and in every direction. Each unit of heat that is transferred from the exhaust steam to the feed water is so far a step in the direction which Ericsson and others are now diligently exploring."

Thus we have quoted from the article in question; it is a profundity to appear in any magazine in the month of May Anno Domino, 1853. Here it is broadly stated that a number of packages of wire gauze (the regenerator) has an inherent virtue (principle) in themselves to pump the Niagara river dry, with the use of one ounce of coal, in a day. This surpasses any work of animated nature which has come from the hands of the Great I Am; it goes far beyond the principle of life itself. This one ounce of coal and a few packages of wire gauze is certainly the introduction of the homopathic system into modern engineering; the results promised are, an infinite amount of power from a few scruples of heat. A man has lost his life by the bite of a gnat, but who would have thought that the Niagara river could be pumped dry by a snuff-box full of charcoal, or the Atlantic (ship) propelled across the Atlantic with a thimble full of anthracite; but so it seems, these things can be done by a wonderful principle in a few packages of wire gauze. It is really astonishing that this principle was not discovered long before this time, as it might have saved our country in five years, at least $50,000,000 for railroads to the mining regions, and no less than $500,000,000 in fuel.

When we commenced the Scientific American we found that the believers in perpetual motions, and the obtaining of power from levers were very numerous, but by spreading abroad a correct mechanical philosophy, we believe there is not one of our readers who now entertains any such notions. But the most insane perpetual motionist never uttered such an amount of extravagant nonsense as is contained in the foregoing paragraph. There is not an apprentice engineer in our land, we believe, that does not know what an ounce of coal can do in generating an expansive force. It can raise 50 tons of the water of Niagara river one foot high, and no more, by all the wire gauze regenerators or any other device on this terrestrial ball.

The example, upon supposition, which is adduced to prove this principle in the regenerator—working it out with a series of *ifs*—is really a droll one, and may well be compared to a new system of financeering, whereby independant fortunes may very soon be acquired by taking any number of bank bills, exchanging them into gold, then into bills again, and so on *ad infinitum*, doubling the original value of the bills every time they are transferred. Our brokers may obtain a useful hint from this wonderful principle in the caloric regenerator.

There is no law better established than that there is a fixed relation between heat and its effects; a certain quantity of heat perfectly measurable, will produce a fixed amount of physical disturbance in another body, and no transfer from one medium to another (not even a modern spiritual medium) can make 491 deg. of heat in a cubic foot of air raise more than 2.160 lbs. one foot high. It is a great mistake to suppose that the unexpended heat in a steam engine, by transfer, embraces anything like the claim for this principle in the regenerator; as well might a claim be set up for a gain of power—as has been done—by the application of a fly wheel to an engine. The saving of unexpended heat in steam, and a gain of power by transfer are totally different doctrines which have been jumbled and confounded together by the author of the above.

There is an article in the last number of Silliman's Journal of Science and Art, by W. A. Norton, Professor of Civil Engineering in Yale College. It concludes with these words; "it must be admitted to be within the bounds of possibibility that caloric ships may hereafter compete successfully with the celebrated ships of the Collins' Line, at least this conclusion seems to follow unless we have underated the weight of the caloric engines. It must be left to time to decide the question whether the full estimated power of the caloric engines can be actually obtained; and whether, therefore, the results which have been indicated, will, from being a mere ideal limit, ever come to an actual realization."

We like to see men and magazines devoted to science speaking out—showing their hands, that we may be able to form some opinion of their real, not professed qualifications; but we must say that Prof. Norton's conclusions have a kind of half hanged look about them, they exhibit a want of that confidence which we like to see displayed in a man conversant with science; they read as if he was not sure whether he was right or wrong. The calculations which he enters into in his article are mixed up with so many exceptions, such as "some little uncertainty" about this and that, that they are worse than useless to engineers in this part of the country. We have said, without any may-bes about it, that ships propelled by hot air, from the very nature of the element employed as the expansive motive agent, can never be successful, and never will compete with the slowest steamship now running, much less with the splendid Collins' Line. Time will decide who are the best judges.

Generation of Heat.

Dr. Alexander Mayer, of Paris, announces that he has been able to obtain heat for all the purposes for which heat is now used, by means of friction. An apparatus for this purpose will soon be exhibited to the public.—[Ex.

[This is nothing new. Water has been boiled by friction frequently, but it requires more physical and mechanical force to raise the heat than the amount of power derived from it by re-action. The cheapest way of obtaining heat is by the combustion of fuel.

Fire Damp.

The investigations in England into the causes of the frequent explosions of the fire damp in the coal mines of that country, have developed the fact that the miners, while at work, are in the habit of lighting their pipes by sucking the flame through the wire gauze of the safety lamp, by which imprudence the dreadful explosions are often occasioned.

Cause of Insanity.

The "New York Medical Gazette" states that twenty-nine suicides, five murders, and two hundred and nine cases of insanity, are directly traceable to spiritual manifestations.

The figures, we believe, are greatly exaggerated, we have no confidence in them.

TO CORRESPONDENTS.

J. B. W., of N. J.—We suppose you have received our letter in regard to the machine formaking safety fuse : the sample is very good.

W. M. B., of Mich.—We have no machine shop attached to our concern ; steam cylinders and boilers can be procured of Stillman, Allen & Co., of this city, or any manufacturer in Detroit.

W. R. McF., of Tenn.—The World's Fair will open when the Crystal Palace is ready ; the time of opening is not announced, but it looks to be some distance ahead.

J. B. W., of Me —We can give you no kind of information as to the time your application will be examined. We have now some applications in the Office which have lain for six months, and no action taken upon them yet.

A.H.,of Ill.—We wrote you at Chicago on the 12th inst.

E., of Ohio—Your alleged improvement in paddle-wheels contains no new feature ; the same thing is old and well known.

A. S. L., of N. Y.—There is nothing new in your bedstead fastener ; the hook and staple are old devices for this and analogous purposes.

J. R W., of N. Y.—We do not think the improvement you suggest in car wheels could be secured by a patent; if it should prove decidedly useful, however, a patent might be secured for it.

J. C., of Mo.—To do the article justice we should have to get cuts for the purpose. We shall be happy to notice your work when it is published, which no doubt will be an excellent one

N. C., of Ohio—We have never seen an arrangement and combination like yours for working the valves to obtain the advantages you state ; it appears to be patentable, but so much has been done in this field, that it is difficult to give a positive answer.

W. S. F., of ——.—Yours has been received and will meet with attention.

S. A., of Pa.—We do not perceive any thing of a patentable character in your method of constructing saw mills ; the mode of hanging is very well known.

W. M. W., of N. J.—We have no recollection of any communication from you, and presume it has missed us from some cause.

J. B. W., of Pa.—We cannot give such information as you want without an opportunity of examining a sketch and description of it.

F. Y M., of N. J.—We have already published a much as we know respecting the anastatic printing process.

C. J. E. M., of Pa.—We have handed your letter over to an experienced engineer for attention.

W. C. of Ohio—A revolving set of water buckets is not new in applicatin for high falls. We illustrated this device in volume 6.

F. P. K., of Pa.—Go on with your improvements ; they are valuable and must inure to your benefit.

S. K. L , of Va.—Your invention is a most excellent one, and you can certainly obtain a patent. We have no doubt but you will make a fortune out of it.

R. W., of N. Y.—The best thing for your own interest is to get good engravings of your invention published in the Sci. Am. It will at once direct public attention to the merits of your invention.

T. S. I., of Ohio—Your gauge is not new, and therefore no patent can be secured on it. Several inventions involving essentially the same principle are well known.

M C., of Pa.—Your first inquiry is entirely foreign to our business, and we have no time to attend to it; to the second we would state that a patent was granted in 1843 for the same thing.

Money received on account of Patent Office business for the week ending Saturday, May 14 :—

S. K. & Co , N. Y., $52 ; D. H , of Ky , $60 ; H. C. S , of Ct., $25 ; S. & K, of Mass., $10; J. K. & W. P. G , of Pa., $30 ; A. & S., of N Y., $10 ; G. M. B., of N. Y , $30 ; A. C. C., of Ky., $55 ; C. C. L., of N. Y , $30 ; J. H. Mc. G., of Ohio, $30 ; S. B. & Co., of Mass., $30 ; J. G., of N. Y., $30 ; J. R. S., of N. Y., $15 ; M. S. B., of N. Y, $50 ; W. L., of N. Y., $25 ; R. P. W., of N. Y., $30.

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

G. D., of Ohio ; H. C. S., of Ct. ; J. G., of Phila.; T. L. J., of Miss. ; S. T. M., of N. Y. ; W. L., of N. Y. ; M. S. B , of N. Y.; R. P. W., of N. Y.

A Chapter of Suggestions, &c.

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

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 3 and 4—none. Of Vol. 5, all but six numbers, price, in sheets, $1 ; bound, $1?5. Of Volume 6, all; price in sheets, $2 ; bound, $2,75. Of Vol. 7 all ; price in sheets, $2 ; bound, $2,75. Of Vol. 8, all the back numbers subsequent to No. 27, but none previous.

ADVERTISEMENTS.

SCIENTIFIC MUSEUM.

Interesting Discovery in Electro Gilding.

It has long been known that fine gold or gold coin can be dissolved, if fastened to the negative pole of a galvanic battery and immersed in a strong solution of cyanide of potassium, but I believe that, previous to my discovering the fact, it has not been known that gold can be dissolved in cyanide of potassium without the use of any acids or of the battery, simply by procuring a lot of refuse gold from the bookbinder's or sign painter's (at 80 cents per dwt.) and immersing it in a solution of cyanide of potassium, and in a short time it will disappear, having been dissolved in that menstrum. In like manner the gold contained in the rags used by the gilder, for removing superfluous gold leaf, may be reclaimed simply by soaking the rags in the solution for a short time, taking them out and pressing the liquid. The gold is taken up in the liquid without injuring the rag in the least. The result is a saving of time, trouble, and expense. To the truth of the two first, the electro plater will readily affirm, for he may by using the battery lately discovered (a strip of zinc pointed with copper and immersed in the cyanide gold solution), dispense entirely with nitro muriatic and sulphuric acids, either in their use of dissolving or depositing the gold. The gold-beater here does for us, by mechanical means, what we were heretotore under the necessity of doing with powerful chemical solvents, namely, distending the surface of the gold almost infinitely, thereby diminishing its attraction of cohesion so much that it is readily dissolved in this feeble solvent. Refuse gold leaf can be bought for 80 cents per dwt., whereas coin of equal fineness is worth one dollar—leaving a saving of 20 per cent. Cyanide of potassium is also an excellent means of removing misplaced gilding from books, signs, or picture frames. For this purpose, by means of a sponge, the gilding is kept moist for a short time with the liquid, when the gold will be found to be dissolved without injuring those articles in the least.

J. F. Mascher.

Fire-Proof Bronze.

1-16th of an ounce of verdigris, and the same quantity of finely pounded muriate of ammonia, are to be dissolved in ⅘ths of a pint of rain-water, the solution left standing covered for 3 to 4 hours, and then 1½ pint more water poured into it. The copper vessel, which must be perfectly clean, is now to to be held over a charcoal fire until it is equally heated throughout and becomes uniformly tarnished. The copper is now to be rubbed over with the mixture, and then carefully dried.

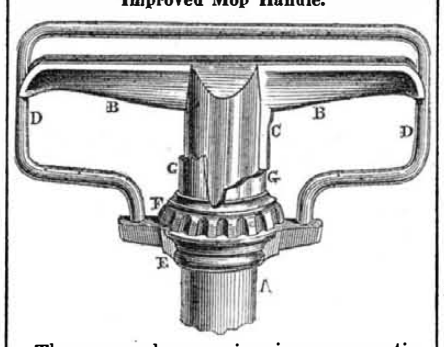
After five or six repetitions of this treatment, the copper receives a brass color; after from six to ten repetitions, it acquires a fine yellow. If the copper is now to be changed from yellow to brown, it must no more be wetted whilst hot; if, however, it be desired to have it very pale brown, the process must be repeated twenty or twenty-five times.—When the desired color is attained, the copper is to be laid in clean water, taking care, however, to clean it or dry it rapidly after taking it out. This must be done carefully. The copper is then held over a weak charcoal fire, when the bronze becomes permanent and fire-proof.

To give a fire-proof, brown bronze color to brass, the following is the process:—

3-32 of an ounce of crystallized verdigris and the same qnantity of sal-ammoniac are mixed with ⅘ths of a pint of rain water, and left to stand for 2 to 3 hours. The brass is then to be rubbed over with it for 2 to 3 minutes, when it becomes green. 1¼ pints of rain water is now to be added to the solution. The metal is now held over a charcoal fire, which must not be too strong, until it acquires a copper color. It is then again wetted, and left to dry by evaporation. When it has been treated in this manner four or five times, it becomes olive-colored. The heat may now be somewhat increased, but it is necessary to be very careful that the metal does not become too hot. When it has been treated nine or ten times in this manner, it becomes brown. As long as any greenish places are to be seen, however, this treatment must be continued, in many cases 20 to 25 times before the required color is obtained.

If, however, the metal be strong, the materials are to be dissolved in hot rain water, and the metal rubbed with it immediately until it acquires a fine dark green color; it is then to be held over a strong charcoal fire, by which means it acquires a fine brown color after 10 to 12 repetitions of the treatment.—It is necessary to be careful that the metal is equally heated throughout. If spots appear, they must be bitten out during the work and polished with brick dust.

Improved Mop Handle.



The annexed engraving is a perspective view of an improved mop handle, invented by Timothy Randletts, of Shakers Village, North Enfield, N. H., who has taken measures to secure a patent for it.

A is the wooden shank; on this shank is fitted the metal socket of jaws, B B. There is a groove in the edge of these jaws. D D is a sliding cross clasp fitted into the sleeve, E, which surrounds shank A; this clasp fits into the groove in the jaws, B B, and retains the mop firmly, when the sliding nut, G, is in its proper place for that purpose. This is not a screw nut; the notches, F, are merely for the purpose of enabling it to be turned round easily with the thumb and finger. There is a slit or groove shown in the nut, G, and a number of indentations on its outer edge. The slit is for the purpose of allowing said nut to be slid up on the projection, G, on the socket of B B, so as to push up the clasp, D, and allow the mop to be taken out. When it is put in again between the clasp and B B, the nut, G, is turned so as to bring the slit, as shown, past the projecting edge, C, and thus prevent the mop from coming out whilst being used. The indents on the edge of G G, enables the clasp to retain mops of various degrees of thickness between the jaws of B B and the said clasp. This is the most handy and convenient mop handle that has ever been presented to our notice and it deserves to come into universal use.

More information may be obtained by letter addressed to Jason Kidders, North Enfield, N. H.

Musk.

This substance is an unctuous secretion of a glanular pouch or sac, situated in the skin of the abdomen of the musk-deer, an inhabitant of the great mountain range which belts the north of India and branches out into Siberia, Thibet and China. It is also found in the Altaic range near Lake Baikal, and in some other mountain ranges, but always on the borders of the line of perpetual snow. It is from the male only the musk is produced, and the secretion when dry is of a dark brown or black color, and somewhat granular. Its taste is bitter, and its peculiar and penetrating odor is well known. It was formerly held in high repute as a medicine, and it is still so among eastern nations. The musk-deer is eagerly hunted for the sake of its costly perfume, which, however, is always adulterated. Tavernier says that the odor of musk, when recent, is so powerful as to cause the blood to gush from the nose, and in this way he would account for the supposed adulteration of the article with dried blood.—Chardin also says, "It is commonly supposed that when the musk sac is cut from the animal, so powerful is the odor it exhales, that the hunter is obliged to have his mouth and nose stopped with folds of linen, and that often in spite of this precaution the pungency of the odor is such as to end in death. I have heard the same thing talked of by some Armenians who had been to Boutan, and I think it is true. The odor is so strong in the East Indies that I could never support it; and when I trafficked for musk, I always kept in the open air, with a handkerchief over my face, and at a distance from those who handled the sacs, referring them to my broker: and hence I knew by experience that this musk was very apt to give head-aches, and is altogether insupportable when quite recent. I may add that no drug is so easily adulterated or more apt to be so." Tavernier states that at Patana he once bought 1,673 musk bags weighing 2,557½ ounces, containing 452 ounces of pure musk. The musk from Boutan, Tonquin, and Thibet, is most esteemed; but it is supposed its strength and the quantity produced by a single animal varies with the season of the year and the age of the animal. A single musk-bag usually contains from 2 to 3 drachms. Musk is imported into England from China in caddies of 60 to 100 ozs. each; that from Bengal is inferior, and from Russia of a still lower quality. The best is that contained in the natural follicle or pod. When adulterated with the animal's blood it forms into lumps or clots. It is sometimes mixed with a dark, highly colored, friable earth; the musk is then of a more friable texture, harder and denser than genuine musk.

Musk is very remarkable for the diffusiveness and subtlety of its scent; everything in its vicinity soon becomes affected by it, and long retains it; a very minute portion, such as a grain or two will scent a room for years, and is sufficient for imparting to articles of dress, &c., a powerful perfume. One part of musk will communicate its odor to 3,000 parts of inodorous powder. Boiling water dissolves 90 parts of genuine Tonquin musk; alcohol only 50 parts. Musk is soluble in ether, acetic acid, and yolk of egg. Moisture seems to favor the odor of musk, for when dry it yields but little scent, and this becomes powerful when moistened. An artificial musk is prepared with nitric acid and oil of amber.

About Snakes.

A paper was lately read before the Boston Society of Natural History, from Dr. W. J. Burnett, on the character of the rattlesnake. The doctor had been experimenting on two or three specimens of this animal, and announces the discovery of numerous embryo poison fangs in the jaws of the snake, immediately behind the outward fangs. The use of these hidden weapons of destruction appears to be to supply the place of the biting fangs of the serpent when they get broken off or worn out in service. It also appears that the long fangs (two in number) which are used in inflicting the bite of the rattlesnake, are naturally shed every few years, when they are not injured by accident or wear, and the reserve fangs are sufficiently numerous to meet the worst emergencies. From minute microscopal examination of the structure of these teeth, Dr. B. concludes that there are two canals in each fang, only one of which conveys the poison to the wound. Respecting the character of the poison itself, the doctor remarks as follows:—

"There is good reason for the belief that its action is the same upon all living things, vegetables as well as animals. It is even just as fatal to the snake itself, as to other animals, for Dr. Dearing informed me that one of his specimens, after being irritated and annoyed in its cage, in moving suddenly, accidentally struck one of its fangs into his own body, it soon rolled over and died, as any other animal would have done. Here then, we have the remarkable, and perhaps unique philosophical fact, of a liquid secreted directly from the blood, which proves deadly when introduced into the very source (the blood) from which it was derived!"

In order to scrutinize by the aid of the microscope the operation of this deadly agent on the blood, Dr. Burnett stupified one of the fiercest of his snakes by dropping chloroform upon his head.

"Twenty-five or thirty drops being allowed to fall on his head, one slowly after the other, the sound of his rattle gradually died away, and in a few minutes he was wholly under this agent. He was then adroitly seized behind the jaws with the thumb and fore-finger, and dragged from the cage and allowed to partially resuscitate; in this state a second person held his tail to prevent his coiling around the arm of the first, while a third opened his mouth, and with a pair of forceps, pressed the fang upward, causing a flow of poison which was received on the end of the scalpel. The snake was then returned into the cage.

Blood was then extracted from a finger, for close microscopal examination. The smallest quantity of the poison being presented to the blood between the glasses, a change was immediately perceived—the corpuscles ceased to run and pile together, and remained stagnant without any special alteration of structure.—The whole appearance was as though the vitality of the blood had been suddenly destroyed, exactly as in death from lightning. This agrees also with another experiment performed on a fowl, where the whole mass of the blood appeared quite liquid, and having little coagulable power."

Dr. Burnett is of the opinion that the physiological action of the poison of the rattlesnake in animals is that of a most powerful sedative, acting through the blood on the nervous centres. He supports this position by the remarkable fact that its full and complete antidotes are the most active stimulants; and of these alcohol (commonly in the form of rum or whiskey) is the first. This remedy is well known at the South, and there are some twenty-five authentic cases on record proving that a person suffering from the bite of a rattlesnake may drink from one to two quarts of clear brandy without feeling the slightest tendency to intoxication, and eventually recover.

Poisons.

It was Liebig's theory that arsenic proves poisonous not by virtue, so to speak, of its own venom, but by arresting those processes of decomposition and destruction which are always going on among the solids and fluids of the body, as an essential agency of life. Dr. Cockle, of England, in his late pamphlet "On the Poison of the Gobra di Capello," thinks the poison of that serpent acts by promoting unduly those processes. Granting that both are right, the poison of the cobra and arsenic may be quoted as types of two different classes of poison, the septic and anti-septic.

Remedy for the Sting of Bees.

The stung place is to be rubbed with the freshly-pressed juice of the honeysuckle. The expressed juice may be kept in closely-stoppered bottles for this purpose.