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Telegraph Improvements.

On the evening of the 4th instant, a severe thunder storm prevailed for some hours in the region of New York City, and extended far eastward, along the Atlantic seaboard. Its influence paralyzed all the telegraphs, and suspended intercourse on those highways of thought—the wire conductors. In the midst of the storm, the steamer *Niagara*, from Liverpool, arrived at Halifax, but the wires failed to convey the intelligence which she brought. It had been stated in a number of the daily papers that Hughes' new telegraph would be able to operate in such storms when all other telegraphs failed. This was stated to be one of its new and superior qualities, and certainly, if it possessed such, its value could not be over-estimated. We were informed that this telegraph had been put on a line between New York and Boston two weeks ago, and surely there never was a finer opportunity of showing its superiority over others than on the evening named. Why it did not, or could not operate, we have not been informed, but we are confident that without perfect insulation and protection of the conductors, neither the Hughes nor any other telegraph apparatus can operate during thunder storms. It is not the machines, but the wires which now cause the greatest trouble to our telegraph companies and the public, and it is to this feature in telegraphic operations that we wish to direct attention.

There is much that is mysterious in the nature of electricity. The common way of explaining its action on a telegraph line, is by comparing it to water flowing through a tube—hence the current is generally called an electric *fluid*, and the wire a conduit or conductor. But electricity is not a fluid according to the usual meaning of that term; and its action is totally different from water flowing through a tube. A copper wire covered with silk, and wrapped in numerous convolutions around a piece of soft iron, exerts such a peculiar influence upon the iron, as makes the latter capable of drawing or attracting heavy metallic bodies towards it. It naturally would be supposed that, as the wire was covered with silk (which is a non-conducting substance,) that the electricity would pass onward and exert no influence upon the iron—but such is not the case. It is therefore totally different in its nature from any known fluid; it exerts an influence of a peculiar character through and outside of the covering of its wire or conductor, and it is also affected by like influences, outside of its conductor, such as atmospheric electricity, during thunder storms. The wires of our electric telegraphs, therefore, when exposed, as they now are, will always be subject to the counter action of atmospheric electricity, and thus oftentimes rendered incapable of operation, no matter whether the Hughes or any other telegraphic machine be employed in transmitting messages. Atmospheric electricity (lightning) is oftentimes so intense, also, that it takes possession of the wires of a line, vaults along them, and enters the offices, where it melts and injures all interposing connections and apparatus. This is a difficulty connected with telegraphic operations, for which perfect insulation—not the machine—appears to be the only *sure* remedy. Telegraphic interruptions, so common at certain seasons of the year, are great drawbacks to the usefulness of this great modern invention. How tantalizing to the feelings of the public, and to men in business, when waiting with anxiety for a deeply important message passing on the wires, to be informed of the suspension of the communication by some sudden thunder storm passing over a section of the line. Such interruptions are not unfrequent, and are of no minor importance. No efforts should be spared to prevent them; no efforts should be spared to render the telegraph perfectly reliable in its operations under all circumstances, but this never can be effected without perfect insulation and protection of the conductors. To such improvements for perfecting telegraphing—this great modern improvement in communicating rapidly between distant places—intense application should now be directed.

Notes on Ancient and Curious Inventions.—No. 9.

Preserving Timber.—Wood is unfit for building purposes, especially ships, in the state in which it is felled, for if placed in a confined situation, the humid nitrogenized matter in the sap soon decomposes, and induces rapid decay. Timber, therefore, should have its sap dried, removed, or changed, before it is finally applied for building purposes.

The ordinary method of seasoning wood consists in exposing it to a free current of air, the wood being in the form of planks, boards, logs, or scantling. If the pieces are thin, like boards, six months' exposure in a dry situation will complete the desication for houses; but thick pieces, like beams, sills, &c., require a much longer period, and the closer the grain of the wood the longer is the time required. Oak logs, two or three feet in diameter, require five or six years to season thoroughly. The exposure ought to be continued until the wood ceases to lose weight by evaporation. In all shipbuilding establishments logs may be seen lying about for years, waiting until they are fully seasoned.

The seasoning of thick logs is better effected, and sooner, by exposing them for some weeks in a running stream of water, to wash out the sap; or by boiling them in water in long tanks.

In 1825, a patent was taken out in England for drying wood in vacuo, and under heat. The timber was placed in a long air-tight iron cylinder connected with an exhausting pump, and when all the air was exhausted the cylinder was heated by steam, and all the moisture of the wood driven off.

The amount of moisture contained in green wood varies according to the closeness of its grain, from five up to forty-five per cent. of its weight; and it is never fully expelled in any timber that is dried in the open air. The seasoning of timber by dry steam, appears to us to be the best method of desication; and for timber only requiring to be thoroughly dried (as all timber should be) for house building, we recommend it as the best and most simple method. Every saw mill in our country should have its steam-drying house, in which boards, planks, and scantling should be thoroughly dried before sent to market.

The nitrogenized matter in the sap of wood is the cause of its rapid decay,—it is called vegetable albumen. In its nature it is similar to animal albumen, which is very putrescent in its nature, when exposed to low heat and moisture. To preserve wood thoroughly, this albumen must be removed, thoroughly dried, coagulated, or changed in its nature by combining it in the wood with some solution that will alter its chemical nature. Common seasoning dries the sap of the wood; and if the wood be kept from moisture in a dry situation, and exposed to a free circulation of air, as in a dry building, it will endure for thousands of years. We have seen timber eight hundred years old, and it was as fresh and strong as the day it was put into an old cathedral. But the choice of a dry situation for wood, and a free circulation of air cannot always be obtained; therefore, if wood can be so treated to endure for a long time in any situation, the method of so treating it should be more generally known. It can be so treated.

If the albumen is removed from wood before it is applied for building purposes, it will not be found so liable to decay. It can be washed and boiled out, but when removed, the fiber of the wood is greatly weakened. When all the strength of the timber is desired to be retained the albumen, therefore, must not be removed. It can be retained and coagulated by a heat of 230°, and steam heat is the best for this purpose. But, if some of the strength of the timber can be dispensed with, the albumen may be washed out by placing logs in a running stream of water, for three weeks, with their butt ends up stream. After this they may be sawed up into boards, and seasoned by exposure in the open atmosphere.

The application of varnish to the outside of timber, to protect it from the influence of the moist atmosphere, has long been known and practised for the preservation of timber, but unless wood is perfectly sap dried before varnish or paint is applied, its decay will be hastened, not prevented.

The greatest efforts of men of science and inventors have been directed to the preservation of wood by chemical processes, to change the nature of its albumen. Various antiseptic substances have been employed for this purpose. The process called "kyanizing," consists in treating timber with the chloride of mercury (corrosive sublimate.) In solution it combines with the sap of the wood and forms an insoluble compound, not susceptible of fermentation and spontaneous combustion. This substance effects the same result when applied to animal albumen. It is employed, therefore, by aviarians for preserving birds, insects, &c. The wood sawed in blocks or planks, is soaked for seven or eight hours in tanks containing a solution made up of one pound of corrosive sublimate to every five gallons of water. The impregnation can be effected in open tanks by sinking the wood, or in close tanks, where the air can be extracted by an air pump, and the solution allowed to flow in. This is a very good process, but it is expensive, and besides it is a dangerous solution for those engaged in the operations.—Another good substance for preserving wood by combining with its albumen and forming an insoluble compound, is the sulphate of copper (blue vitriol.) It is applied in solution about the same strength and in the same manner. The sulphate of zinc (white copperas) is also a good solution for the same purpose. About two quarts of crude pyroligneous acid added to every gallon of the sulphate of copper solution, improves its preservative qualities. Lime has been patented for preserving wood, but it injures the fiber of the timber. Alum in solution has also been tried, but while it counteracts the decomposition of the albuminous matter, it acts injuriously upon the fiber of the wood, and impairs its strength. Common salt is a preservative of timber, for it is an antiseptic, and it has been extensively used in the preservation of the timber of New York ships. The ships built on the shores of the Baltic Sea, always endeavor to make their first voyage with a cargo of salt. For preserving house timber, owing to the deliquescent nature of common salt, it is unfit to use, but this is owing to that impurity—chloride of calcium—in the salt, for pure salt (chloride of sodium) is not very deliquescent in its nature. If, then, it could be obtained easily and cheap, we would recommend that much of the timber for building purposes, such as for bridges, &c., be impregnated in a solution of it. We have been given to understand that *pure* salt is now manufactured in considerable quantities at Syracuse, N. Y. Live-oak, used for ship-building, is impregnated with salt to render it preservative; the best Turk's Island, we understand, being used for this purpose.

Oils are also preservatives of wood; and the whaling ships are evidences of its virtues. They seem to be proof against decay. Hot oil has been experimented with in impregnating wood, but while it rendered it more durable, it injured the tenacity of the fibers. From the well-known preservative nature of arsenic, it would be effectual for preserving timber, but its use is so dangerous that we can not recommend it. Timber impregnated with a solution of tannin, is rendered preservative, by the tannin combining with the albumen, and forming an insoluble compound, in the same manner that leather is produced by the combination of the tannin with the gelatin of skins. Oak trees have been preserved fresh in peat bogs for thousands of years. Creosote is an excellent preservative of wood, and the efficacy of common tar, for this purpose, is attributed to the creosote it contains. The boiling of timber in wood tar, renders it highly preservative, but it impairs its strength. About two gallons of creosote to every 100 gallons of water, makes a sufficiently strong solution for use.

Burnet's process for preserving wood, consists in the use of a chloride of zinc solution—one pound to every five gallons of water. It is applied in the same manner as the corrosive sublimate described. For ship timber it is much superior to corrosive sublimate, because the compound it forms with the albumen of the wood is insoluble in salt water; which is not the case with the mercury compound. A solution of this substance is also excellent for preserving the canvas of sails and awnings, and is now much used for this purpose. The canvas is first steeped for two hours in a liquid of this chloride zinc of a strength of 3° by a hydrometer, then taken out, dripped, well washed, and dried. It is made by dissolving clean strips of zinc in muriatic acid; this is reduced for use by the addition of soft water. The chloride of zinc and the sulphate of copper, are the most simple and best preservatives, considering the cost.—The former is the best, the latter the most convenient for common use. We therefore recommend these substances in preference to all others. Shingles for the roofs of houses, boiled in a solution of the sulphate of copper or pure salt, will last many years longer than they otherwise would.

Recent American Patents.

Machine for Husking Corn.—By Oren Stoddart, of Busti, N. Y.—The ears of corn are pushed down by an attendant between a pair of rollers having raised stumps of rubber upon them. The rollers rotate in a direction contrary to that in which the ears are pushed and serve to strip off the husk. The butt, or stalk part of the ear, is cut off by means of a knife, which comes in play as soon as the ear passes the rollers. The husks are discharged at one place, and the clean ears at another.

Preventing Damage from Water.—By Thos. Estlack, Philadelphia, Pa.—Great damage to goods often ensues from the flooding of stores and warehouses with water in cases of fire.—This improvement consists in placing the floors of buildings on a slight incline, and providing the lower side of each floor with a trough connecting with a common leading pipe, which extends down to the pavement. If the floors are at any time flooded, the water at once runs off into the trough and escapes to the street without doing injury.

Improvement in Harvesters.—By A. B. Wilson, of Waterbury, Conn.—In this improvement the cutters are all pivoted and cut, like the knives of a straw cutter, against hide, or other suitable material. There is also a peculiar arrangement for driving the cutters, varying their hight from the ground, etc.

Oil Gas Apparatus.—By S. H. and M. C Walker, Lancaster, Pa.—Brilliant illuminating gas for lighting dwellings, stores, factories, and churches, may be made without difficulty from common oil. The apparatus and the process are quite simple. A heated retort is provided, the oil is introduced at the top or roof, and falls, drop by drop, upon the bottom. Contact with the heated metal converts it almost instantly into gas. But the oil leaves a slight residium, which is liable to collect on the spot where it falls, and, after a time, impedes the operation. The retort must then be opened and the residum scraped off.

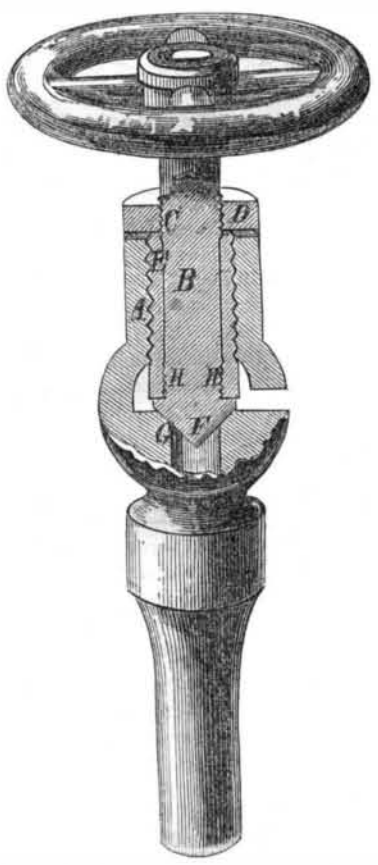
The object of the present improvement is to provide a means of scraping away and removing the substance named without opening the retort. This is done by having a receptacle or pocket at one end of the retort and a scraper within. The handle of the scraper passes out through a small aperture in front of the retort. The operator moves the scraper as often as necessary, and pushes the stuff into the pocket. When not in use the handle may be unscrewed, the scraper left within, and the aperture tightly closed. Oil gas is very extensively manufactured in various parts of our country. The above improvement greatly facilitates its production.

Improvement in Steam Slide Valves.—By William Burdon, of Brooklyn, opposite New York.—This invention consists in a hollow cylinder placed within the steam chest and supported upon wheels, to run on the valve seat or on suitable ways when the steam chest is parallel therewith; said cylinder is arranged with its axis perpendicular to the valve seat, and is open at the end next the valve seat to receive a piston attached to the valve. It is closed at the opposite end. This piston is of such size as only to leave a portion of the valve exposed to the pressure of the steam, said portion being of an area sufficent to re-

ceive the amount of pressure requisite to confine the valve to its seat. The valve being fitted steam tight to the cylinder causes the unnecessary pressure that would come upon it to be received by the head of the cylinder, and transmitted thereby to the wheels which roll upon the seat or ways. The movement of the valve is, in nearly all engines, attended with great friction, but by this improvement it is almost entirely destroyed.

Improvement in Melodeons.—By Josiah A. Rollins, of Buffalo, N. Y.—The principal object of this invention is to arrange within the instrument four sets of reeds, and to combine two sets of valves to be played by one set of keys, yet keeping all the reeds on one tube board. The construction of the instrument is thus rendered simpler than when the reeds are arranged in two banks, while at the same time the depth or width of the case of the four-reed instrument is not any greater than that of the ordinary melodeon. Instruments of this improved description possess, in effect, quadrupled musical powers.

Improved Valve Gauge Cock.—These cocks are used for steam boilers and many other uses where it is necessary that cocks should be tight when new, and capable of being easily re-ground when they become leaky.



Referring to the above engraving, the improvement consists in having an outer shell, E, shipped over the spindle, B, and fastened as shown, at the screw threads, H H, and further secured by a flat nut, D, screwed hard against the end of shell E, at the thread, C. By turning back the hand wheel, the valve, F, is opened, or run back from the seat, G, allowing the steam or water to pass out through the opening below; the part, I, should be six-sided.

To re-grind this gauge cock, it is only necessary to run the spindle and shell out of the body, A, and slack back the nut, D, unscrew the shell at H H, and the spindle and valve is free to revolve, can be ground with emery, &c.; after this, replace the parts again, and the cock is as good as new. This is a good improvement. Patented Jan. 15th, 1856, by McNab, Carr & Co., No. 133 Mercer st., New York City.

Improvement in Window Frames.—By John Casey, of New York City.—This invention consists in having a portion of one of the side pieces or stiles of the window casing movable, so that the sashes may be conveniently removed from the pane for washing or repair without detaching any portion of the beads or molding. The improvement may be applied to all windows.

Washing Machine.—By Solon Bishop, of Homer, N. Y.—Consists of a tub containing a round rubbing board, between which and the bottom of the tub the clothes to be cleaned are placed. A yoke or bar is placed upon the upper end of a central spindle, and arranged so that the rubbing disk will have a proper bearing at whatever hight it may be varied within the tub or case.

Improvement in Bench Retorts.—By John G. Hock, of Newark, N. J.—In gas making it is common to heat five retorts with one fire.—Each set of five retorts thus arranged is called a "Bench." The present method of heating is defective, for the flame is suffered to curl around the retorts and strike with greater intensity upon their top parts. This soon burns through, and they are useless.

The above improvement consists in a novel arrangement of flues, whereby the flame and heated products of combustion are made to act on the retorts in such a manner as to heat them with a greater degree of uniformity than they can be by the common method. The durability of the retorts is thus increased, and a considerable saving in fuel also effected.

Saw for Cutting Irregular Forms.—By Henry S. Vrooman, of Logansport, Ind.—Consists in a peculiar manner of hanging the saw sashes, adjusting the same, and also a new method of arranging the saws in the sashes so that the saws may, by the aid of patterns, be made to cut all kinds of stuff, timber in curved or irregular forms, for various purposes.

The Press on the New Patent Bill.

The *Pen and Lever*, published at Washington, D. C., contains an able review of the new Patent Bill, in which exceptions are taken to nearly every section contained in it. We wish we were able to present the whole of this review, but we can only find room for a few extracts.

Respecting the enormous increase of new fees proposed, it says:—

"We do not see how any unprejudiced person can read the list of fees and avoid the conviction that it is calculated to make the Patent Office a commodious crib for feeding an enlarged herd of office-holders at the expense of inventive dupes, rather than to promote the useful arts, by encouraging inventors. Hitherto, by charging patentees thirty dollars, and rejected applicants ten dollars, the Office has been able, not only to pay its own expenses, but to accumulate a surplus of a few hundred thousand dollars. But this bill, without guaranteeing the inventor any superior advantages or privileges, will raise the official fees for every patent to a sum never less than $130, and sometimes as high as four or five hundred dollars. For instance, last year, a patent was granted embracing sixteen claims. If that patent had been appealed, first to the Commissioner, and then from him, under this proposed system, the expense of the patent, in Office fees alone, would have been not less than $425. Now what is the object in extorting so much money from the inventor? Certainly, if the Office is properly administered, but a small portion of such exhorbitant fees can be required to pay its expenses."

Regarding the increased rate of fees for copying, it says:—

"Again, the fees for copying are proposed to be raised from ten to fifteen cents per hundred words. At the present rate, of ten cents a hundred words, an experienced copyist can earn from seventy-five cents to a dollar an hour, and cannot work the full number of official hours, lest his earnings would amount to more than a regular salary paid to clerks of a similar grade. For whose benefit, then, is this increased cost of copying intended? In addition to the succession of superfluous payments required to be wrung from the poor inventor, a pittance of twenty-five cents for each hundred words which the specification may contain more than one thousand words, is to be charged to the patentee for engrossing his patent."

On that wonderful feature of the bill to which we specially directed attention—the solemn *confirming act*—it is both sharp and severe. It says:—

"But the most important and objectionable section of the bill is that which requires the "confirmation" of a patent within five years, or else the patent shall terminate. Instead of the term of fourteen years originally, and an extension of seven years, as the law now allows, the bill provides that the patent shall originally be granted for only five years. And before the expiration of that period, if the inventor would extend the duration of his patent, he must make application to that effect, paying a fee of one hundred dollars.

"The objections to this plan are so numerous we can hardly enumerate them. It would be a complete death-blow to the inventive spirit of our country. Any one can in a moment see that none but the wealthy and the pirate would ever succeed in having a patent confirmed, if of any use or consequence. The poor inventors would be debarred at once from extending it, from their inability to raise and risk large fees. The consequence would be that they would never attempt to obtain the patent originally, for they would, of course, know that they could not sell an invention till after the patent should be confirmed, since not one patent in a hundred could be sold for any amount, in view of the uncertainty, delay, and expense of confirmation. Hence, the spirit of invention would almost entirely die away, unless the law should be promptly repealed. The applications for patents would soon dwindle down to the few which wealthy owners of inventions might think it worth their while to attempt to secure.

The delay consequent on this plan would debar most of the very few who would otherwise risk the poor chance of confirmation. For, as the first five years of the patent would be worse than useless—a perfect purgatory to the inventor, most inventors would give up the invention in despair.

In general, we dislike its whole plan and spirit—it requires heavy fees, for no earthly object, except to overburden the inventor, and oppose obstacles, instead of offering encouragement to improvement; it causes long delays, which are an oppressive burden even when protracted but a few months; it requires a succession of troublesome and complicated procedings, which are a complete horror to inventors; it supposes the poor inventor always to have the poorest invention, for its professed object is to prevent the prevalence of useless or unused inventions, and it is generally the poverty of the inventor, and not the uselessness of his invention which prevents its coming into use, while the really worthless invention, more generally, has wealth to support it, for sinister purposes; in short, not content with the difficulties and obstacles with which the Patent Office takes such especial pains now to entangle the inventor, under the present law, and of which inventors are so loudly complaining, all over the country, it ingeniously weaves other webs to entrap the last innocent victim.

If we cannot have a better patent law, let us retain the present."

The *Kane County Republican*, published at Geneva, Ill., says, respecting the Bill, "From an examination of some of the amendments we are fully convinced that certain interested parties are at the bottom of the whole affair. We hope for the good of the country it will not pass."

The *Recorder* of Amsterdam, N. Y., says: "It is the opinion of many who have carefully examined the Bill, that it contains some features which will assume an ugly appearance when brought out into practical light, and will open the door to fraud and oppression a hundred times wider than the present system. Two objectionable features are quite obvious. It greatly increases the difficulty with persons of small means in obtaining patents, and it increases the power and patronage of government."

The Savannah, Ga., *Morning News* says:—"Perhaps the strongest argument against any radical change may be found in the fact, that hitherto our patent system has been considered the most simple and perfect in the world, and has been a model for England and other nations."

The *Jefferson County News*, of Adams, N. Y., says: "The Bill seems to be most admirably designed to benefit other interests than what ostensibly appears on its face, and in one section authorizes the Commissioner to expend $400 for printing copies of descriptions, specifications, &c., of every patent, which would amount to a million of dollars in a single year."

Since the Bill has been published in the Scientific American and our brethren of the Press have had an opportunity of examining it for themselves, they have very unanimously condemned it.

Who first employed Anthracite Coal in Smelting Iron.

In a recent article in the New York *Tribune*, on the progress of iron manufacturing, it was stated that there was a dispute respecting who was the first to apply anthracite coal in the smelting of iron, and the names of George Crane, of England, and Rev. Dr. Geissenhainer, of New York, were mentioned in connection with the subject, and the credit given to the latter. In the *Tribune* of the 5th inst., F. W. Geissenhainer, Jr., claims the invention exclusively for the Rev. Dr. Geissenhainer, and states that he obtained a patent for melting iron ore with the hot blast, by anthracite coal, and obtained a patent in 1833, and that in 1835 a furnace was erected in Schuylkill Co., Pa., to carry out the invention. He says, "iron manufactured in that furnace being now in my possession—the first either in this or any other country, manufactured by the exclusive use of anthracite coal by means of a chemical combination and a hot blast." By the tone of the whole letter it would appear as if it were the intention of its author to convey the idea that Dr. Geissenhainer was the first person who applied anthracite coal, exclusively, to smelting iron. He also states that Mr. Crane, of London, afterwards applied for an American patent, which was opposed by Dr. G., but he paid the latter a thousand dollars for the use of his invention, and afterwards took out a patent. We will now quote the remainder of the letter:—

"Immediately after this purchase and the establishment of the validity and priority of the patent, the executors of Dr. Geissenhainer freely opened to the world the use of his patented discovery, and hence it is that all the iron furnaces in the State of Pennsylvania have been erected free of patent charges or fees."

Now, instead of Dr. Geissenhainer being the first who used and successfully smelted iron ore with anthracite coal, his patent dates five years later than Benjamin B. Howell's of Philadelphia, who had erected a furnace as early as November, 1828, and manufactured malleable iron from the ore by the *exclusive use* of anthracite coal for fuel. The Rev. Dr. Geissenhainer was neither the first to use anthracite coal in smelting iron ore; nor was he the inventor of the hot blast. It was very easy for his executors to be generous in giving his patent to the public. "Honor to whom honor is due," and the person who deserves credit for the first successful application of anthracite coal to the manufacture of iron, from the ore, is Benjamin B. Howell, of Philadelphia.

Curious Instinct of Plants.

Hoare, in his treatise on the vine, gives a striking exemplification of the instinct of plants. A bone was placed in the strong but dry clay of a vine border. The vine sent out a leading or tap-root, directly through the clay to the bone. In its passage through the clay the main root threw out no fibers; but when it reached the bone, it entirely covered it, by degrees, with the most delicate and minute fibers, like lace, each one sucking a pore in the bone. On this luscious morsel of a marrow bone would the vine continue to feed as long as any nutriment remained to be extracted.

American Steamboat Engines for the Danube.

Engines are now in the course of construction at the Morgan Works, this city, for two light steamboats designed to run on the lower Danube. They are to be sent to Austria to be put in boats building at Alt Afen, from designs by George Steers. These engines are being constructed under the supervision of Charles F. Loosey, Esq., the efficient Austrian Consul General at this port. They are to be steam apostles of American progress.

Perpetual Almanac.

Mr. Wm. Hillhouse, of New Haven, Conn., has shown us a small cylindrical Almanac, of his own inventing, which, by slight changes, is made to exhibit the days and months of any year, past, present, or to come for a thousand years or more. It is a simple instrument.