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Contents:

(Illustrated articles are marked with an asterisk.)

NEW AND IMPORTANT PATENT OFFICE RULE.

Commissioner Foote, in his firm purpose to break up certain practices in vogue in the Patent Office, has promulgated a very stringent and important rule, which ought to be understood by all inventors who intend to apply for Letters Patent.

It has hitherto been the custom of the Office to permit applicants, or their attorneys, to withdraw papers either before or after a rejection, for the purpose of making amendments. Hereafter this practice will not be allowed. Papers once filed must remain in the Office, and are not to be inspected for any purpose whatsoever, either by the applicant or his attorney.

The rigid enforcement of this rule renders it doubly important that specifications and drawings should be carefully prepared, in the first instance, by experienced and competent attorneys, and not by those who have little or no knowledge of the rules and practices of the Patent Office.

We admit that the new rule will operate somewhat severely upon such inventors as do not feel able to employ an attorney, yet we doubt not Commissioner Foote has had good reasons for promulgating the rule.

A BRITISH AMERICAN INTER-OCEANIC RAILWAY.

One of the papers read before the British Association related to a proposed railway to cross the American continent on a line lying wholly north of the United States. The author of this paper, Mr. Waddington demonstrated that the Pacific Railroad now so rapidly approaching completion would eventually throw the entire carrying trade between Europe and the East into the hands of the United States unless competitive measures were adopted. The only means of preventing such a result are in his opinion the immediate construction of a rival railway through the British possessions. The line he proposes, is from Ottawa to Fort Garry, 1165 miles; thence to Jasper's House, a further distance of 1,100 miles, thence by the Yellow Head Pass, 620 miles to the head of Bute Inlet opposite Vancouver's Island; the entire distance being 2,885 miles. He gives as a rough estimate of the entire cost of the road, rolling stock, stations, etc., the nice little sum of one hundred and thirty-five millions of dollars. But the cost is not to be considered as a serious matter when the results are properly estimated. Here is the argument:

"We shall be told that such an outlay is far too great to be thought of. But what we have to consider is not merely the amount, but the object to be attained, and whether that is commensurate with the outlay. If the commercial supremacy of England is at stake—and that has been pretty clearly shown— what are twenty million pounds sterling compared with the sad downfall which must inevitably follow such a loss, and the decay and ruin of our country? Never was so large a sum more usefully, more wisely applied; and in vain might we ransack the history of our national debt to find a parallel. In times past a single subsidy to some Continental potentate has cost more."

The history of the national debt of England, shows that heretofore no amount of money was considered too large to be used for the assertion of national and commercial supremacy. If then the facts are as stated by Mr. Waddington, there is little doubt that the money would be forthcoming, if the project were proved to be feasible and likely to pay. These are in our opinion big *if's*, and although he claims that the severity of the climate has been exaggerated; that the country between Ottawa and Fort Garry is with a single exception, north of Lake Superior, level and fertile; that the difficulties in crossing the Rocky Mountains though serious can be surmounted, it is impossible for us to conceive how the road could become self-paying, as Mr. Waddington believes, in six years from its completion, if indeed it would ever become so. The past history of railroad enterprises has shown that such projects must be based upon something more than the advantages secured by the location of their termini. There must be enterprise, manufacturing and agricultural facilities along the lines sufficient to warrant increase of freight and travel from intermediate points. The route under consideration has neither of these advantages. Its climate would always prevent its competing with the Pacific Railroad for passengers, and it is too distant from the seaboard to become a manufacturing district. Altogether we think that this road would if built, become the most extraordinary white elephant ever owned by the British Government.

PREHISTORIC ARCHEOLOGY.

Man's first appearance upon the earth, or rather the time of his first appearance has, in the light of modern science, become a most interesting subject of inquiry. It seems already established that this event took place much further back than has been usually believed. Such an announcement as this would have been much more startling a few years since than it is now, when it has come to be acknowledged that the Mosaic account of the creation of the world conflicts with science only so far as it is imperfectly understood. The six days, in which all things were created, has been shown to mean six distinct periods in which the great work was accomplished, the appearance of man being the last and crowning act.

The orthodox world is no longer alarmed at the relative attitudes of science and theology. It has come to see that time is no element in the working of the allwise Creator, and that by whatever process creation was accomplished, the same power must be acknowledged. To draw an argument from a celebrated biblical author. Everything that exists either always existed, or it had a beginning. Grant a beginning, and you admit a cause. An examination of the works themselves gives the evidence of intelligent design. Therefore, the cause is an intelligent one. By the same method, all the attributes of deity may be discovered, so that without the Bible, God is revealed in His works.

Should man, therefore, be found to have existed for six millions of years, instead of six thousand, the fact proves nothing adverse to revealed or natural religion. It strengthens them rather. For certainly the methods which science reveals are more in accordance with the nature of an infinite and allwise being than the interpretations which have been given to the Mosaic record. That record states the fact, and the order in which creation took place, and science fully sustains the record. The precise length of the periods, which have been rendered "days," has nothing to do with the matter. Creation is still going on around us every day, every moment. A grain of wheat is no less created now, than at the beginning, and the same power that created it then creates it now. But creation is now a gradual process, and the multiplication of species, was undoubtedly a long and gradual work, but a *work* nevertheless.

The science of philology has been one of the instruments by which the prehistoric existence of man has been determined, but we can not in this article attempt anything further than a mere recognition of its aid in solving the problem. The theories of Agassiz, and others, regarding distinct geographical centers of origin has also had much weight in forming opinions upon this subject, but the proof of the existence of man at very remote periods, is based upon more solid grounds than either of those we have mentioned. Not only the implements and utensils of man, but human bones have been found, in positions, and under circumstances which give undoubted evidence of very great antiquity. The veteran geologist, Lyell, has fixed the antiquity of some of these remains at two hundred thousand years, which is considered by many as too small.

In view of these facts, the examination and study of human remains, everywhere, are becoming of the greatest interest, and prehistoric archeology is assuming the proportions of a science. It has its facts, and the conclusions based upon them are rapidly being systematized. The "whence and whither," of mankind are the most interesting subjects which the mind of man can contemplate, and although the latter is the one of most vital importance, there is a peculiar mystery about the origin of man which must ever render it peculiarly fascinating to scientific men.

ALCOHOL---ITS NATURE, USES, AND EFFECTS.

While we never intend to use the columns of the SCIENTIFIC AMERICAN as a vehicle for the promulgation of the ideas of extremists, either in science, mechanics, or morals, nor to assume the rôle of teacher of morality, or social science, yet the domain of the moral reformer so often trenches upon or overlaps the province of natural science and the arts, that it would be strange indeed, if we did not recognize the fact. No product of natural or artificial chemistry—if such a term may be allowed—has ever had so widespread and searching an influence on the social habits and personal morality of men as alcohol. The nature and the use of this agent then is worthy attention, even if viewed simply in a scientific light. Such a view comes properly within our domain, as the editors of a scientific and mechanical journal.

Common alcohol is designated by the formula, $C_4 H_6 O_2$—Carbon, 4; Hydrogen, 6; Oxygen, 2. It is called by some writers the "spirituous or intoxicating element in all intoxicating liquors;" by others, "rectified spirit." Wine drinking peoples seem to agree in the name by which it is designated. The French call it *Esprit de vin;* the Germans, *Rectificirter Weingeist;* the Italians, *Acquavite rettificata;* the Spaniards, *Espiritu rectificado de vino*—spirit of wine, or rectified or purified spirit of wine.

But whatever may be learned of its composition, we judge of its qualities more by its effects when used. It is a natural result of one kind of decomposition called fermentation; and this fermentation, and the consequent production of alcohol is not confined to the action of the still, nor to influences outside the human organism. As an instance in support of the latter statement, we may mention that we have repeatedly seen an old Micmac Indian get "gloriously" drunk on sweetened water, a solution of common brown sugar in water. In this case the fermentation could not have taken place in mixing and dissolving in the tumbler, but in the Indian's stomach.

Ginger pop, root beer, ale, all fermented liquids, and vinegar (unless formed by the distillation of pyroligneous acid), contain more or less alcohol; and these so-called harmless beverages depend as much for their exhilirating quality upon the alcohol they contain as on the carbonic acid gas in their composition. It may be possible for one whose stomach is unused to stimulants, to feel sensibly, after drinking these beverages, the same effects, although in a less degree, that the habitual drinker seeks in the rum or whisky bottle. But it is hardly to be credited that the stomach would contain enough of these liquids to produce real intoxication.

We judge of the nature of alcohol by its effects on animate and inanimate bodies. Take the latter, first. Alcohol is one of the best, if not the very best antiseptic known. Matter, which could be by no other means so well preserved from decay, change of form, or alteration of structure, is held *in statu quo* by alcohol. Extracts of the qualities of herbs, minerals, and animal substances, useful in medicine and the arts, can be preserved in their purity and power by no other agent so well. Beside its antiseptic qualities, alcohol is a stimulant, aiding in the effect of the drugs or extracts with which is combined. It stimulates the physical forces of the human system, when rendered inactive by disease; it is a "force-put," a "make-shift," as mechanics would say; useful to keep the enfeebled body from the grave, and to impart new life to organs almost past sensation by other means.

And there its usefulness ends. It never imparted additional strength to the robust; it never made the old young; it gives nothing; it only acts on what there *is*. When pure, it is a deadly poison, antagonistic to life. Its effect on the lining of the stomach, intestines, and other internal organs—the mucous membrane—can be produced even upon the epidermis or external skin, to such an extent as to blister. Alcohol does not assimilate—has no affiliation with the secretions of the human organism. It passes out of the stomach in precisely the same condition in which it entered it. It shows itself in the breath of the habitual drinker, in his perspiration, his evacuations. It is still alcohol. Part may be retained in the blood, which it thins and weakens. For a time it is held in the brain, stimutating it to unnatural activity; but it leaves the organ as it was before, or rather enfeebled by the task it performed while under the subtle influence of the wine spirit.

But we shall not be betrayed into a homily against the use of alcoholic stimulants. We desire only to present the facts, and leave each to judge for himself. We are aware that eminent physiologists, and others, have written labored defences of alcohol; but those who have experienced its effects upon themselves—on their physical system—leaving out its influence on their mental powers, are well fitted to judge of the value of the statements, arguments, and facts, produced by these defenders of the habitual use of a rank poison. Plain, palpable facts, are stronger than philosophical disquisitions; but, *chacon a son gout.*

THE NORTH POLE AND ITS SEEKERS.

North of Spitzbergen the Atlantic Ocean is exceedingly deep. Soundings have been attempted, and, although a mile or more of line has been used, the bottom has not been reached. The warmer currents, of which the Gulf Stream is the most notable, flowing from the Equator toward the pole, of course keep the surface, while the cold currents flow near the bottom. This well known fact has led to the belief that there must be, somewhere, a limited region where the warmer currents, meeting, would form a sort of eddy, and constitute an open polar sea. The observations of explorers have given strength to this belief. An exchange, in discussing this part of the subject, remarks that "the great Gulf Stream which is continually pouring an enormous volume of water—far warmer than the ocean through which it flows—into the Arctic Seas, must largely affect the condition of the North Polar regions. Where this stream finds an outlet, and by what course its waters find their way round Greenland into the Baffin's Bay current, are yet moot points among seamen. But whatever opinion we may form on these questions, there can be no doubt that an enormous quantity of heat is liberated somewhere in the neighborhood of the North Pole through the agency of the Gulf Stream; and it is far from being impossible that, during summer, at any rate, the circumpolar ice fields are wholly melted away."

"It is a singular fact, that in whatever direction the North Pole has been approached, traces should always have been noticed of a comparatively warm circumpolar sea or Polhynia. Baron Wrangel started northward from the coast of Siberia, over the vast fixed ice fields which cover the Arctic Sea there. He supposed that these extended far toward the North Pole, but before long he found open water, and was compelled to abandon his attempt to reach the Pole in that direction. When De Haven went in command of the American expedition in search of Sir John Franklin, he was told in his letter of instructions that when he had gone far up into Wellington Channel he was to look for an open sea to the northward and westward. He did so, and saw in that direction a " water sky." A few years later Captain Penny found open water there, and sailed upon it. We have seen that Dr. Kane, in 1855, saw open water from the northern extremity of Kennedy Channel, and our readers will scarcely need to be reminded of the evidence which Dr. Hayes' recent voyage affords of an Arctic Ocean extending far to the north of Greenland. In the year 1818, again, Barrington and Beaufoy called the attention of scientific men to the evidence of Dutch captains, who asserted that they had approached within two or three degrees of the Pole, that they had there found an open sea, which was heaved by a swell that showed it to be of wide extent."

Dr. Kane, also, infers the former existence of open water further south than its has been discovered, from the traditions of the Esquimaux. Such traditions rarely are found to be without good foundation.

Admitting the existence of a permanent, open sea around the pole, the question, " can it be reached by vessels?" is natural in view of the efforts now being made to accomplish that object. So far, every attempt to penetrate to it has been prevented (unless it were actually reached by Penny) by an impenetrable wall of ice. Navigators have sought in vain for leads through which their vessels might be forced, and many have been forced to abondon them in the ice-locked channels which have closed only too surely behind them. Is there a permanent and fixed break somewhere in this ice-wall, a gate ever so narrow, ever so perilous by which access can be obtained to the mysterious Polar Sea? As yet practically undecided the question finds some who believe yes, and others who believe no. Both parties find arguments to sustain their position. It is argued that the tides which rise and fall in the open Polar Sea, could not occur unless there were some large inlet communicating with the main ocean. To this it is answered that the sea is sufficiently large to admit of an independent tidal wave. Maury, while admitting that the ice wall would be a complete obstacle to the tidal wave in the Atlantic, takes this ground. He says: "I apprehend that the tidal wave from the Atlantic could no more pass under the icy barrier to be propagated in the seas beyond than the vibrations of a musical string can pass a fret on which the muscian has placed his finger. These tides must have been born in that cold sea, having their cradle about the North Pole."

Others hold that the tidal wave of the Atlantic finds its way into the Arctic Ocean round the northeastern shores of Greenland, although barred off on the side of Kennedy Channel. An adverse opinion is based upon the appearance presented by the planet Mars.whose atmosphere resembles great ly that of the earth. The white spots at the poles of Mars never entirely vanish, although, in the summer,which that planet has, as well as the earth, they become less conspicuous It is argued from this that the open sea at the North Pole is not permanent in form or position. It is also argued with much force that the statements of different navigators confirm this view; as where one has found open water others have failed to find it at the same season, and *vice versa*. The question must yet remain open, as there are approaches to the pole which have never yet been thoroughly expl red. A definite answer will, no doubt, be given by the combined observations and discoveries of the different expeditions already far on their way to the north.

The German expedition, when last spoken, was in 80½° north latitude, having failed to reach the eastern shores of Greenland in latitude 75°. At that time it was still sailing northward. The Swedish expedition, when last heard from, was in latitude 80°. The route which these expeditions have taken, although on many accounts very promising, has nevertheless been fruitful of failure to other navigators. In 1607 Hudson reached 81½°. Cabot had previously reached a high latitude in the same waters. In 1827 Parry made the attempt to reach the North Pole by sailing as far north from Spitzbergen as possible, and then resorting to boats and sledges. A reward had been offered the party, if they should succeed in reaching eighty-five degrees, but they only reached a point 120 miles distant from that latitude. Here they were carried back by the ice as fast as they could advance upon its surface, the entire ice field being found to be floating steadily toward the south.

Whether the present expeditions are to be more successful remains to be shown. Meanwhile we shall be obliged to remain in suspense, as probably the last news of them has reached us until their return, if that event ever takes place.

AMERICAN SILK MANUFACTURE.

The entire value of raw silk produced in the world amounts annually, in round numbers, to two hundred and fifteen millions of dollars. The value of silk goods manufactured in France, amounts annually to nearly one hundred and fifty millions dollars. The United States have been and are still the best customer for French silk goods. Possessing mechanical skill equal to any nation on earth. and unequaled manufacturing facilities, we have yet allowed our gold to flow out in a constant current, to purchase French goods. For this there have been two reasons. First, the difference in the current rates of labor existing in Europe and America; and second, the hitherto inferior quality of goods produced in this country. The first of these reasons might have been remedied by a proper tariff upon imported silks; but so long as the second remained, there would have been nearly the same demand for manufactured silks from abroad, as the inferior article produced in this country would not have found favor with consumers of such goods. A good article of silk goods will always be preferred, without regard to its price.

Both these obstacles to the progress of silk manufacture in America are now removed. The present tariff on foreign silks enables our manufacturers to compete with European labor, while the quality of goods now produced here is in many instances equal if not superior to the imported. In order to bring the manufacture of silk to its present state of perfection in the United States many difficulties had to be surmounted. some of which we shall notice at length.

The peculiarities attending the manufacture of textures from any particular fiber, depend upon the nature of the fiber itself. The machinery used must be adapted to these peculiarities. Cotton is worked dry, the fibers admitting of being drawn in any direction; that is, two fibers of cotton laid side by side will slide one upon another either way. Two fibers of wool laid thus would be found to slide only in one direction. the wool fiber being barbed or serrated. Wool, therefore, can not be drawn out like cotton, and it requires to be oiled in order to reduce the tendency of the fibers to cling to each other in the process of carding. Flax needs to be wetted before it can be spun, in order that the fibers may be evenly drawn out, and distributed so as to make a uniform thread Silk fiber differs very materially from any other used in textile fabrics.

Silk is a hardened thread of gum, secreted by larvae of different species of the Phalaena genus of insects. The thread is composed of two filaments, which are spun simultaneously and cemented together. When wound into the cocoon, the coils mutually cohere to each other, but readily separate upon being immersed in warm water, so that the entire thread can be reeled off. As many of these filaments as may be desired to give a thread of any required size are reeled off together, and become cemented so as to form one thread. In this state it is the *"raw silk"* of commerce. When this thread is twisted, to add to its strength and firmness it is technically called *"singles."* Two or more *singles* twisted together form *tram* silk, which is generally used for the *shoot* or weft in weaving. When two singles are twisted together in an opposite direction to that in which the singles are twisted, *thrown silk* or *organzine* is the name given to it, and the process is called throwing. The lengths of filaments vary from 300 to 600 yards in a single cocoon. When the filaments are to be joined no knot is necessary, the natural gum on the silk being sufficient to effect the junction. The raw silk used in America is chiefly imported. It comes in the form of packages, each containing more or less silk as well as different qualities according to the quarter from which it is obtained. The several operations through which this silk passes in forming the different textures, are winding, cleaning, spinning, doubling, throwing reeling, dyeing, and weaving or braiding. In each of these operations, special regard is necessary to the peculiar nature of the material, its elasticity being a prominent feature.

On a recent visit to the establishment of the Dale Manufacturing Company, in Patterson, N. J., we witnessed the entire process of silk manufacture, and as the success realized by these and other works settles all doubts as to the entire practicability of the silk manufacture in this country, we believe that we can not furnish more valuable matter of information to our readers than a description of them

The ground plan of the mill is in the form of a T, the main portion having an extension from its center 50 feet in width, running 100 feet back from the rear. The main part of the building is 275 feet in length, 50 feet in width, and four stories high The building was designed by and built under the supervision of Thos N. Dale, Esq., President of the company, the entire labor being performed by day's work. The walls are twenty inches in thickness, and the building is as substantial a specimen of architecture as any structure we have seen designed for manufacturing purposes.

A portion of the lower floor is occupied by a spacious office, which opens into a large storeroom. In this storeroom is an enormous fire-proof safe for storing the raw material, etc. capable of containing millions of dollars worth of goods. From the lower floor of the extension above referred to, project two minor extensions, one each side. The first of these contains the dye works of the establishment, and the second the engine and boiler. These are so situated that in case any explosion should ever take place, the main building would not be jeopardized. The engine is of the well known Corliss make, and is of eighty horse-power. The entire building is heated by steam, and ample provision is made for the extinction of fire which, however, is less likely to occur than in cotton manufactories. The portion of the first floor not occupied by the office and storeroom is devoted to winding and cleaning. The raw silk is here placed upon reels, and from thence wound on to spools. The reels are six sided, and are technically called swifts. They are adjustable to suit the sizes of the hanks, and balanced so that they will not break the threads by irregular motion. By means of weights enough friction is produced upon their axes to keep the threads stretched. The bobbins have each an independent motion, and any one can be taken off and replaced without interfering with the others. An eye through which the thread passes to the bobbin has a traverse motion, by which the thread is wound obliquely, and lateral adhesion is prevented. Constant care, watchfulness, and intelligence are necessary in this as well as in all the subsequent operations.

Cleaning is performed by fixing the bobbins horizontally on plain spindles, and passing the thread between two adjustable pieces of metal. Should a knot or other unevenness chance to be on the thread, these pieces of metal prevent it from passing through, the plate of metal is depressed and the bobbin is lifted off the friction roller which gives it motion, The stoppage being perceived by the attendant, the defect is removed and the work proceeds. The silk being cleaned, it is next spun. The second floor is devoted to this operation. The spinning is, however, only the twisting of the threads, the real spinning having been done in the outset by the silkworm. The twisting is effected by passing the threads required from the bobbins upon which they are wound, to other bobbins placed on spindles provided with flyers, through the eyes of which the threads pass. The amount of twist is regulated by the vel city of the second series of bobbins, which have the usual traverse motion.

When the threads are twisted they are next doubled, that is. several of them are wound together upon the same bobbin. They are next twisted together upon frames precisely like those used for spinning. This process is called throwing or spinning, and the silk after it is thus twisted is called *thrown silk*. The doubling frame is provided with independent stop motions, one for each thread, so that when any one breaks the bobbin upon which it is being wound stops, until the thread is mended by the attendant and set in motion again.

The silk is now ready for the dyer. It may be dyed in a *hard* or *soft* state, that is, with the gum on, or removed by long boiling with soap and water. The proper estimation of the amount of gum removed is most important, as throughout the whole process of manufacture weight is the basis of value, and the check upon employés. The amount of loss in cleaning is usually 25 per cent. The most admirable system prevails in the works of this company, involving the most strict methods of book-keeping in every department. Each room, when it receives stock in any stage of advancement, credits the department from which it is received, and has the same charged to its account. The goods, when delivered into other hands, must with the waste correspond in weight to what was originally received, minus a small percentage which, adhering to the floors and walls of the room, can not be recovered. The result of all this is two-fold. First, it enables the company to transact its business intelligently, thus avoiding the too common fault of manufacturers—namely, ignorance of important defects until too late to remedy them. Second, the system of tests and checks running through the entire routine of this establishment is such that any fault can be at once detected and traced to its proper source, and the blame thrown upon the person who has committed it. Orders are transmitted in writing to and filed as vouchers by the foreman of each department. An incident illustrative of the benefits of such systemization recently occurred. Some goods were found to be deficient in weight when single pieces were tested, although the aggregate weight was correct. An examination immediately took place, but the cause for a considerable time eluded pursuit. Experiments were instituted, and the error was found to have arisen in the following manner. Some reels having been constructed of the proper size, the edges of the bars had been left somewhat rough. The operative in charge, wishing to correct the fault, sandpapered them, thus slightly reducing the size. This was the sole cause of all the mischief. The reels were afterward protected by plates of polished brass, and the operative cautioned against taking any such liberties in the future. The importance of such a system in the manufacture of a substance so valuable as silk, is obvious.

Dyeing is the next step. Our space will not admit of a full description of this process It is the most critical of all, and although the Americans have been for some time able to compete with the French in all colors save black, the difficulties attending the production of the latter have been only overcome within the last two years. Now, as fine blacks are made here as can be found in any market. A piece of American black dress silk was shown to an expert in our presence, who avowed that it was fully equal in all respects to the French silk, and could be sold as such in France. An error generally prevails among buyers in regard to sewing-silk. The basis of price in this as well as all other silk goods is weight. Silk loses a certain amount in cleansing, as we have shown, but in dyeing it may be increased in weight so as to more than cover the loss. Heavy silks can thus be sold cheaper than light ones, but the gain in weight is at the expense of length of the thread. while the added weight in dyeing does not increase its strength. The high priced sewing silks are, therefore, the cheapest, as greater length of thread of a given strength is obtained for the money than in the cheap silks.

The third floor of this mill is still vacant. It has been reserved as a weaving room for dress-goods; and it is hoped that a company may soon be organized to occupy this room in the manufacture of such fabrics, now that the interests of importers and manufacturers are rendered mutual by the increased cost of imported goods. Formerly, these interests were antagonistic. The result was an effort on the part of home manufacturers to make an article which could compete in price. The effort now is to compete in quality. A comparison of goods shows that the latter attempt has been successful; and domestic silks are now afforded at a less price than the French of equal grade.

The Dale Manufacturing Company confine themselves, as yet, to the production of cords, braids, bindings, sewing silks, etc.: but there are large inducements to commence upon broad goods, which they have already successfully produced in small quantities.

The fourth floor is occupied by looms and braiding machines The looms are of quite a primitive construction some having the Jaquard attachment, but all appearing large and cumbersome for the light and delicate textures formed upon them. We greatly mistake if Yankee ingenuity does not ere long replace these machines with lighter and more effective devices We learn that two important improvements are