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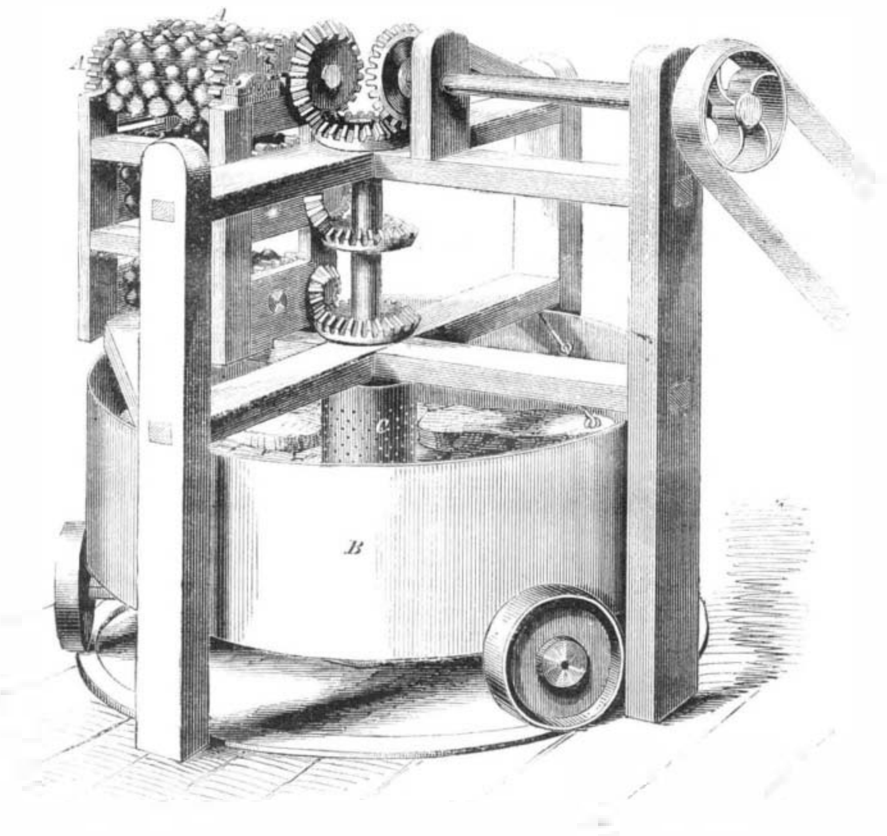
Improved Arastrar or Quartz Crusher and Pulverizer

Gold occurs in quartz rock generally in very minute particles, and to separate it it is necessary to reduce the quartz to a very fine powder, and then to collect the almost invisible particles of gold by amalgamating them with mercury. It is found that many of the particles of gold are covered with iron pyrites which will not amalgamate with mercury, and which consequently operates to protect the pieces of gold, and thus prevent them from being collected and saved. We recently noticed an offer in the papers of San Francisco of $2,500 reward for some substance which would remove this protecting coating of pyrites. The quartz mill which we here illustrate, recently invented by Thomas A. Morris, of Green Bay, Wis., beside crushing the quartz and amalgamating the gold, removes the pyrites from the particles of the precious metal by rubbing them between two hard stones.

The accompanying engraving is a perspective view of the mill, in which the several parts are clearly shown. The quartz, previously broken into pieces of moderate size, is passed between the cast iron rollers, A A. The surfaces of these rollers are formed with grooves around their peripheries, and with longitudinal grooves at right angles to the former extending the whole length of the rollers. The effect of these grooves is to cover the surfaces of the rollers with a series of protuberances, which are rounded at their summits, and so arranged that those upon one roller shall fit into the hollows in the other, and *vice versa*. If necessary, one or two more similar pairs of roller may be placed directly below these to farther pulverize the quartz before it falls into the cylinder, B.

The cylinder, B, rests upon wheels which run upon a circular railway, and it is made to revolve by gearing its axle in connection with the driving power. The bottom of this cylinder is paved with a plane surface of quartz rock, firmly imbedded in suitable cement, and a number of heavy blocks of quarts rest loosely upon this bottom, but are prevented from being carried along with the rotary motion of the cylinder by being attached to the framing of the machine by means of ropes or chains. Around the spindle in the middle of the bottom of cylinder, B, is an opening for the discharge of the water, in a constant flow of which the quartz is ground, and this opening is surrounded by a small cylinder or pipe, C, which is made water tight in its connection with the cylinder, but has its upper portion perforated with numerous small holes, thus serving as a strainer through which the water escapes, while the quartz is retained unless very fine. A supply of mercury is placed in the cylinder, which is filled with water to the hight of the holes in the pipe, C, and as the quartz becomes sufficiently fine to be floated up by the water, it is washed out by the current through the holes in this pipe. As the cylinder revolves, the pieces of quartz and gold are rubbed between its floor and the loose blocks of granite which are held in place by the chains, thus grinding the quartz to a very fine powder, and rubbing the coatings of pyrites from the particles of gold.



MORRIS' IMPROVED ARASTRAR OR QUARTZ CRUSHER.

The patent for this invention was granted, through the Scientific American Patent Agency, Oct. 23, 1860, to Thomas A. Morris and T. R. Schettler, to whom the invention has been assigned, and to whom inquiries for the purchase of machines or rights, or for any further information may be addressed, care of Wing & Mitchell, bankers, Chicago, Ill.

War Terms.

The Columbiad or Paixhan (pronounced pay-zan) is a large gun, designed principally for firing shells—it being far more accurate than the ordinary short mortar.

A mortar is a very short cannon with a large bore, some of them thirteen inches in diameter, for firing shells. Those in use in our army are set at an angle of 45 degrees, and the range of the shell is varied by altering the charge of powder. The shell is caused to explode at just about the time that it strikes, by means of a fuse, the length of which is adjusted to the time of flight to be occupied by the ball, which, of course, corresponds with the range. The accuracy with which the time of the burning of a fuse can be adjusted by varying its length is surprising; good artillerists generally succeeding in having their shells explode almost at the exact instant of striking. In loading a mortar, the shell is carefully placed with the fuse directly forward, and when the piece is discharged, the shell is so completely enveloped with flame, that the fuse is nearly always fired. The fuse is made by filling a wooden cylinder with fuse powder, the cylinder being of sufficient length for the longest range, to be cut down shorter for shorter ranges as required.

A Dahlgren gun is an ordinary cannon, except that it is made very thick at the breech for some three or four feet, when it tapers down sharply to less than the usual size. This form was adopted in consequence of the experiments of Captain Dahlgren, of the U. S. navy, having shown that when a gun bursts, it usually gives way at the breech. The *Niagara* is armed with these guns, and at the Brooklyn navy yard there are sixty, weighing about 9,000 pounds each, and six of 12,000 pounds weight each, the former of which are capable of carrying a nine inch shell, and the latter, a ten inch shell a distance of two or three miles; and there is one gun of this pattern which weighs 15,916 pounds, and is warranted to send an eleven inch shell four miles!

A casemate is a stone roof to a fort made sufficiently thick to resist the force of cannon balls, and a casemate gun is one which is placed under a casemate.

A barbette gun is one which is placed on the top of the fortification.

An embrasure is the hole or opening through which guns are fired from fortifications.

Loop holes are openings in walls to fire musketry through.

To Restore Scarlet Cloth.—Scarlet facings of military uniforms can be partially restored thus: Boil a quarter of a pound of powdered cochineal in a pint of water down to half a pint, then strain the decoction, and repeat the process with fresh water, but the same cochineal, twice; reducing by this means the whole quantity to a pint and a half of red liquor, to which, when so hot that the hand can be just borne in it, add one ounce of muriate of tin, to enhance the brilliancy of the color and give it a tendency to fix in the cloth. To restore the faded cloth, the dye must be applied with a sponge; but, at best, this is but an indifferent remedy, as, to get a fine color, the cloth must be boiled in the liquor itself; and this, of course, involves tailor's work over again. It is probable that the aniline and rosealine made by Messrs. Perkins, of River terrace, Islington, London, will be found very useful for this purpose. The extent to which the rosealine is used may be judged of by the numerous red stockings worn in winter, all of which are dyed with rosealine.—*Septimus Piesse.*

It has been ascertained by a Swedish philosopher, experimenting on a healthy man about thirty-five years of age, confined in a small chamber into which air entered by a hole on one side, and was examined after it passed through at the other, that the carbon ejected per hour was 105 grs. fasting; 190 grs. after breakfast; 130 when hungry; 165 two hours after dinner; 160 after tea; and 100 sleeping; making about 7 oz. daily. As a curious result of the chemical inquiries of the present age, it has also been ascertained, that the quantity of solid carbon breathed in twenty-four hours is 63 oz. by a cow, and about 70 oz. by a horse.

In the months of September and October last, 6,428,000 bushels of wheat were exported from the United States to England.

THE CHEMICAL HISTORY OF A CANDLE.

By Professor Faraday.

A Course of Six Lectures (adapted to a Juvenile Audience) Delivered before the Royal Institution of Great Britain.

LECTURE I.

A Candle—The Flame—Its Sources—Structure—Mobility—Brightness.

I purpose thanking you for the honor you do us in coming to see what are our proceedings here, by bringing before you the Chemical History of a Candle. I have done so on a former occasion, and if I had my own will, I should do it almost every year; so abundant is the interest that attaches itself to the subject, so wonderful are the varieties of outlet which it gives into the various departments of philosophy. There is not a law under which any part of this universe is governed which does not come into play and is touched upon in these phenomena. There is no better, there is no more open door by which you can enter into the study of natural physical philosophy, than by considering the phenomena of a candle. Therefore I believe I shall not disappoint you in choosing this for my subject rather than any newer form, which could not be better, if it were so good.

And having said so much to you, let me say this also: that though our subject be so great, and our intention that of treating it honestly, philosophically and seriously, yet I mean to pass away from all those here who are seniors. I claim the right of speaking to juveniles as a juvenile myself. I have done it on former occasions, and, if you please, I shall do it again. And though I know that I stand here with the knowledge of having the words I utter given to the world, yet that shall not deter me from speaking in the same familiar way to those whom I esteem nearest to me on this occasion. You know that though we make no publication of our proceedings—neither I nor the authorities—we give all facilities to those who honor us by supposing that what they hear here is worth conveying further—we give them every facility to hear us and write about us, but it is entirely their own act. You have here the original, in whatever shape it appears anywhere else.

And now to my boys and girls.

I must first tell you what candles are made of. Some are very curious things. I have here some bits of timber, branches of trees particularly famous for their burning. And here you see a piece of that very curious substance taken out of some of the bogs of Ireland, called *candle-wood*, a hard, strong, excellent wood, evidently fitted for good work as a resister of force, and yet withal burning so well that when it is found they make splinters of it and torches, since it burns like a candle, and gives a very good light indeed. And here in this wood is one of the most beautiful illustrations of the general nature of a candle that I can possibly give. The fuel provided, the means of bringing that fuel to the place of chemical action, the regular and gradual supply of air to that place of action—heat and light—all produced by a little piece of wood of this kind, forming, in fact, a natural candle.

But we must here speak of candles as they are in commerce. Here are a couple of candles commonly called "dips." They are made of lengths of cotton cut off, hung up by a loop, dipped into melted tallow, taken out again and cooled, then re-dipped, until there is an accumulation of tallow round the cotton. In order that you may have an idea of the various characters of these candles, you see these which I hold in my hand—they are very small and very curious. They are, or were, the candles used by the miners in coal mines. In olden times the miner had to find his own candles, and it was supposed that a small candle would not so soon set fire to the fire-damp in the coal mines as a large one; and for that reason, as well as for economy's sake, he had candles made of this sort, 20, 30, 40, or 60 to the pound. They have been replaced by the steel mill, and then by the Davy lamp, and other safety lamps of various kinds. I have here a candle that was taken out of the *Royal George*, it is said, by Sir George Pashley. It has been sunk in the sea for many years, subject to the action of salt water. It shows you how well candles may be preserved, for though it is cracked about and broken a good deal, yet when lighted it goes on burning regularly, and the tallow resumes its natural condition as soon as it is fused.

Mr. Field, of Lambeth, has supplied me abundantly with beautiful illustrations of the candle and its materials; I shall, therefore, now refer to them. And, first, there is the suet—the fat of the ox—Russian tallow, I believe, employed in the manufacture of these dips, which Gay Lussac, or some one who entrusted him with his knowledge, converted into that beautiful substance, stearine, which you see lying beside it. A candle, you know, is not now a greasy thing like an ordinary tallow candle, but a clean thing, and you may almost scrape off and pulverize the drops which fall from it without soiling anything. This is the process he adopted:—The fat or tallow is first boiled with quicklime, and made into a soap, and then the soap is decomposed by sulphuric acid, which takes away the lime, and leaves the fat re-arranged as stearic acid, whilst a quantity of glycerine is produced at the same time. Glycerine—absolutely a sugar, or a substance similar to sugar—comes out of the tallow in this chemical change. The oil is then pressed out of it; and you see here this series of pressed cakes, showing how beautifully the impurities are carried out by the oily part as the pressure goes on increasing, and at last you have left that substance which is melted, and cast into candles as you here see them. The candle I have in my hand is a stearine candle, made of stearine from tallow in the way I have told you. Then here is a sperm candle, which comes from the purified oil of the spermaceti whale. Here also is yellow beeswax and refined beeswax, from which candles are made. Here too, is that curious substance called "paraffine," and some paraffine candles, made of paraffine obtained from the bogs of Ireland. I have here, also, a substance brought from Japan since we have forced an entrance into that out-of-the-way place—a kind of wax which a kind friend has sent me, and which forms a new material for the manufacture of candles.

And how are these candles made? I have told you about dips, and I will show you how molds are made. Let us imagine any of these candles to be made of materials which can be cast. "Cast!" you say. "Why, a candle is a thing that melts, and surely if you can melt it you can cast it." Not so. It is wonderful, in the progress of manufacture, and in the consideration of the means best fitted to produce the required result, how things turn up which one would not expect beforehand. Candles cannot always be cast. A wax candle can never be cast. It is made by a particular process which I can illustrate in a minute or two, but I must not spend much time on it. Wax is a thing which, burning so well and melting so easily in a candle, cannot be cast. However, let us take a material that can be cast. Here is a frame with a number of molds fastened in it. The first thing to be done is to put a wick through them. Here is one—a plaited wick, which does not require snuffing—supported by a little wire. It goes to the bottom, where it is pegged in, the little peg holding the cotton tight and stopping the aperture, so that nothing fluid shall run out. At the upper part there is a little bar placed across, which stretches the cotton and holds it in the mold. The tallow is then melted, and the molds are filled. After a certain time, when the molds are cool, the excess of tallow is poured off at one corner, and then cleaned off altogether, and the ends of the wick cut away. The candles alone then remain in the mold, and you have only to upset them, as I am doing, when out they tumble, for the candles are made in the form of cones, being narrower at the top than at the bottom, so that what with their form and their own shrinking, they only need a little shaking, and out they fall. In the same way are made these candles of stearine and of paraffine. It is a curious thing to see how wax candles are made. A lot of cottons are hung upon frames, as you see here, and covered with metal tags at the ends, to keep the wax from covering the cotton in those places. These are carried to a heater where the wax is melted. As you see, the frames can turn round, and as they turn, a man takes a vessel of wax and pours it first down one, and then the next, and the next, and so on. When he has gone once round it, if it is sufficiently cool, he gives the first a second coat, and so on until they are all of the required thickness. When they have been thus clothed, or fed, or made up to that thickness, they are taken off and placed elsewhere. I have here, by the kindness of Mr. Field, several specimens of these candles. Here is one only half finished. They are then taken down and well rolled upon a fine stone slab, and the conical top is molded by properly shaped tubes, and the bottoms cut off and trimmed. This is done so beautifully that they can make candles in this way weighing exactly four or six to the pound, or any number you please.

We must not, however, take up more time about the mere manufacture, but go a little further into the matter. I have not yet referred you to luxuries in candles (for there is such a thing as luxury in candles). See how beautifully these are colored; you see here mauve, Magenta, and all the chemical colors recently introduced, applied to candles. You observe, also, different forms employed. Here is a fluted pillar most beautifully shaped; and I have also here some candles sent me by Mr. Pearsall, which are ornamentrd with designs upon them, so that, as they burn, you have, as it were, a glowing sun above, and a bouquet of flowers beneath. All, however, that is fine and beautiful, is not useful. These fluted candles, pretty as they are, are bad candles; they are bad because of their external shape. Nevertheless, I show you these specimens sent to me from kind friends on all sides, that you may see what is done and what may be done in this or that direction, though, as I have said, when we come to these refinements, we are obliged to sacrifice a little in utility.

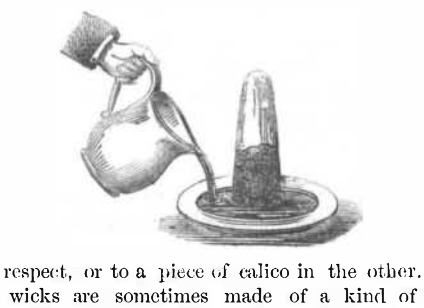
Now as to the light of the candle. We will light up one or two, and set them at work in the performance of their proper functions. You observe a candle is a very different thing from a lamp. With a lamp you take a little oil, fill your vessel, put in a little moss or some cotton prepared by artificial means, and then light the top of the wick. When the flame runs down the cotton to the oil, it gets extinguished, but it goes on burning in the part above. Now, I have no doubt, you may ask, how is it that the oil, which will not burn of itself, gets up to the top of the cotton where it will burn? We shall presently examine that; but there is a much more wonderful thing about the burning of a candle than this. You have here a solid substance with no vessel to contain it; and how is it that this solid substance can get up to the place where the flame is? How is it that this solid gets there, it not being a fluid? or, when it is made a fluid, then how is it that it keeps together? This is a wonderful thing about a candle.

We have here a good deal of wind, which will help us in some of our illustrations, but teaze us in others; for the sake, therefore, of a little regularity, and to simplify the matter, I shall make a quiet flame, for who can study a subject when there are difficulties in the way not belonging to it. Here is a clever invention of some costermonger or street-stander in the market-place for the shading of their candles on Saturday nights, when they are selling their greens, or potatoes or fish. I have very often admired it. They put a lamp-glass round the candle, supported on a kind of gallery, which clasps it, and it can be slipped up and down as required. By the use of this lamp-glass, employed in the same way, you have a steady flame, which you can look at and carefully examine, as I hope you will do, at home.

You see then, in the first instance, that a beautiful cup is formed. As the air comes to the candle, it moves upward by the force of the current which the heat of the candle produces, and it so cools all the sides of the wax, tallow or fuel, as to keep the edge much cooler than the part within; the part within melts by the flame that runs down the wick as far as it can go before it is extinguished, but the part on the outside does not melt. If I made a current in one direction, my cup would be lop-sided, and the fluid would consequently run over—for the same force of gravity which holds worlds together holds this fluid in a horizontal position, and if the cup be not horizontal, of course the fluid will run away in guttering. You see, therefore, that the cup is formed by this fine, uniform, regular ascending current of air upon all sides which keeps the exterior of the candle cool. No fuel would do for a candle, which has not the property of giving this cup, except such fuel as the Irish bog wood, where the thing is like a sponge and holds its own fuel. You see now, why you would have had such a bad result if you were to burn these beautiful candles that I have shown you, which are irregular, intermittent in their shape, and cannot, therefore, have that nicely-formed edge to the cup which is the great beauty of a candle. I hope you will now see that the perfection of a process, that is, its utility, is the better point of beauty about it. It is not the best looking thing, but the best acting thing, which is the most advantageous to us. This good-looking candle is a bad burning one. There will be a guttering round about it because of the irregularity of the stream of air and the badness of the cup which is formed thereby. You may see some pretty cases (and I expect you to think of these things) of the action of the ascending current when you have a little gutter run down the side of a candle, making it thicker there than it is elsewhere. As the candle goes on burning, that keeps its place and forms a little pillar sticking up by the side, because as it rises higher above the rest of the wax or fuel, the air gets better round it, it is more cooled and better resists the action of the heat at a little distance. Now, the greatest mistakes and faults with regard to candles, as with regard to other points, often bring with them instruction which we would not receive if they had not occurred. We come here to be philosophers, and I hope you will always remember that whenever a result happens, especially if it is new, you should say, "What is the cause? Why does that occur?" and you will, in the course of time, find it out.

Then there is another point about these candles which will answer a question—that is, as to the way in which this fluid gets out of the cup, up the wick, and into the place of combustion. You know that the flames on these wicks burning in candles made of beeswax, or stearine, or spermaceti, do not run down to the wax or other matter, and melt it all away, but keep to their own right place. They are fenced off from the fluid below, and do not encroach on the cup at the sides. I cannot imagine a more beautiful and more compact thing than the condition of adjustment under which a candle makes one part subserve to the other to the very end of its action. A combustible thing like that, burning away gradually, never being intruded upon by the flame, is a very beautiful sight; especially when you come to learn what a vigorous thing flame is—what power it has of destroying the wax itself when it gets hold of it, and destroying its proper form even before it gets hold of it, if it come too near.

Now, how does it get hold of it? There is a beautiful point about that—*capillary attraction*. "Capillary attraction!" you say, "the attraction of hairs." Well, never mind the name; it was given in olden times, before we had a good understanding of what the real power was. It is by what is called capillary attraction that the fuel is conveyed to the part where combustion goes on, and is deposited there, not in a careless way, but very beautifully in the very midst of the center of action, which takes place around it. Now I am going to give you one or two instances of capillary attraction. It is that kind of action or attraction which makes two things that do not dissolve in each other still hold together. When you wash your hands you wet them thoroughly; you take a little soap to make the adhesion better, and you find your hands remain wet. This is by that kind of attraction of which I am about to speak. And what is more; if your hands are not soiled (as they always are by the usages of life) if you put your finger into a little warm water, the water will creep a little way up the finger, though you may not stop to examine it. I have here a substance which is rather porous—a column of salt—and I will pour into the plate at the bottom, not water as it appears, but a saturated solution of salt which cannot absorb more; so that the action which you see, will not be due to its dissolving anything. We may consider the plate to be the candle and the salt the wick, and this solution the melted tallow. I have colored the fluid that you may see the action better. You observe that now I pour in the fluid, it rises and gradually creeps up the salt higher and higher; and provided the column does not tumble over, it will go to the top. If this blue solution were combustible, and we were to place a wick at the top of the salt, it would burn as it entered into the wick. It is a most curious thing to see this kind of action taking place, and to observe how singular some of the circumstances are about it. When you wash your hands you take a towel to wipe off the water, and it is by that kind of wetting, or that kind of attraction, which makes the towel wet with water, that the wick is made wet with the tallow. I have known some careless boys and girls (indeed, I have known it happen to careful people as well) who, having washed their hands and wiped them with a towel, have thrown the towel over the side of the basin, and before long it has drawn all the water out of the basin and conveyed it to the floor, because it happened to be thrown over the side in such a way as to serve the purpose of a siphon. That you may the better see the way in which the substances act one upon another, I have here a vessel made of wire gauze filled with water, and you may compare it in its action to the cotton, in



one respect, or to a piece of calico in the other. In fact, wicks are sometimes made of a kind of wire gauze. You will observe that this vessel is a porous thing, for if I pour a little water on to the top, it will run out at the bottom. You would be puzzled for a good while, if I asked you what the state of this vessel is, what is inside it, and why it is there? The vessel is full of water, and yet you see the water goes in and runs out as if it were empty. In order to prove this to you I have only to empty it. The reason is this—the wire being once wetted, remains wet; the meshes are so small that the fluid is attracted so strongly from the one side to the other, as to remain in the vessel although it is porous. In like manner, the particles of melted tallow ascend the cotton and get to the top; other particles then follow by their mutual attraction for each other, and as they reach the flame they are gradually burned.

Here is another application of the same principle. You see this bit of cane. I have seen boys about the streets, who are very anxious to appear like men, take a piece of cane and light it and smoke it, as an imitation of a cigar. They are enabled to do so by the permeability of the cane in one direction, and by its capillarity. If I place this piece of cane on a plate containing some camphene (which is very much like paraffine in its general character), exactly in the same manner as the blue fluid rose through the salt will this fluid rise through the piece of cane. There being no pores at the side, the fluid cannot go in that direction, but must pass through its length. Already the fluid is at the top of the cane, and now I can light it and form it into a candle. The fluid has risen by the capillary attraction of the piece of cane, just as it does through the cotton in the candle.

Now, the only reason why the candle does not burn all down the side of the wick is that the melted tallow extinguishes the flame. You know that a candle, if turned upside down, so as to allow the fuel to run upon the wick, will be put out. The reason is that the flame has not had time to make the fuel hot enough to burn, as it does above, where it is carried in small quantities into the wick, and has all the effect of the heat exercised upon it.

The Future of Patents.

Professor Page, formerly connected with the Patent Office, publishes in the *National Intelligencer* the following views upon the future value of patents:—

Much unnecessary anxiety is felt by inventors and patentees as to the effects of the present political disturbances upon patent property. As the most thorough believers in the frangibility of the Union, and those who have labored most to demonstrate this principle, seem all determined to cling to the constitution of the United States, as the "ark of safety," inventors and patentees are safe so long as this disposition continues, whatever political or social adversities may befall us. Such property may, indeed, better survive the shocks of political and social strife than property of a more tangible nature; and come what may, the inventor's rights will always be respected and protected in the exact proportion in which such encouragement is deemed material to the welfare of the community at large. The remunerative value of patent property must rise and fall with fluctuations in general business, but the patentee should have no fears of inadequate protection, and inventors should not in the least relax their efforts to prosecute inquiry and secure, by Letters Patent, those rights which even the worst ephemeral anarchy could not wrest from them. Indeed, arguments might now be adduced why inventors should *make haste* to secure their patents; but as these would be founded on the bold assumption of the frangibility of the United States government, I refrain from offering any such premature and illusory stimulation to that worthy and useful class of citizens, who will, despite the times, work on, unswerved in their belief that for them, at least, the Union is perennial.

These views are in accordance with those published by us on page 393 of our last volume.

Labor for Cotton Lands.

The London *Times* publishes a letter from a Paris correspondent which purports to describe the views of the French government as to the results to be obtained from the clause of the treaty with China legalizing the exportation of labor:—

"It will be seen by the late advices from China that this government, in their treaty with the Chinese, have legalized the exportation of coolies.

"This has been done, no doubt, in reference to obtaining a supply of labor for the cotton lands in Algeria.

"The great immorality of the Chinese adults heretofore imported has caused the subject to receive a careful and earnest attention, and a plan has been proposed to import boys and girls brought out under the care of priests and sisters of charity, who, on receiving them in China, will cleanse and clothe them, and begin immediately a religious and secular education.

"On arrival in Algeria, and being distributed among the planters, they will retain their teachers, and be ready with their little fingers to pick the cotton balls as they ripen. The cultivation of the land is to be effected with steam plows and horse hoes, as in this way an enormous area can be kept under culture at a small expense. The yield of cotton (as in the United States) being limited only by the number of pickers, cotton may be thus grown at half the cost of the American, owing to the difference in the value of land and slaves.

"In the year 1855, five bales of cotton were brought to Paris from Algeria, of the best quality; but the want of an organized system of labor similar to the slave system of the States, caused the culture to be abandoned for a time. The great improvements in agricultural machinery have now removed this difficulty in part, and the importation of Coolie children will supply all that is required to insure success at the present time.

"The children are to be apprenticed for twenty years, and to be always under supervision. When the picking season is finished, they are to be employed in raising their own food, and in weaving and making their clothing. At the end of their apprenticeship they can marry and become citizens, with an allotment of land, or return to China, as they please."

"Such," says the *Times*, "is the scheme, which will be carried out in British Guiana, and the other cotton lands in her extended colonies. That there is not a scarcity of cotton lands in the world, the application of the steam plow with the coolie emigration will soon prove. Within five years France and England will raise at least half the cotton they use; promoted not only by the independence that this supply will give them, they will be urged on to the work by the great missionary enterprise which it will inaugurate."

Big Lift.—In Chicago recently, there was a grand display of muscular science by "resident and foreign talent." Dr. Windship lifted 9 kegs of nails, weighing 1,000 lbs. Next, with harness on his shoulders, he raised 1,517 lbs. William Thompson, of the Chicago Gymnasium, did the same. The latter then went on adding weights and lifting, with harness on shoulders and hips, until the number stood successively 1,530, 1,636, 1,736, 1,836, 1,936, 2,036, 2,106—a very remarkable lift, the latter, to be sure. Then Thompson swung the 100 lb. dumb bell and Curtis did the same, and Dr. Windship lifted himself with his little finger, and Thompson experimented with a 165 lb. dumb bell, and Windship shouldered a 229 lb. barrel of flour, and put it down carefully, and Curtis "pushed" 130 lbs. in each hand, with the pulley, and then 150 lbs. in each hand, and, then lying down on his back, put up 110 lbs. in each hand. But the feat of the evening was the great lift of Thompson, and the judges so considered it in the award of the $200 prize to him.

The Manchester Cotton and Woolen Manufacturing Company (located in Manchester, Va., opposite Richmond) have decided to continue during the present year its operations, with very slight dimunition of the number of operatives (the usual complement is 250) in its employment. The proprietors of the Crenshaw Woolen Manufacturing Company, who also employ a large number of persons, have determined on a similar course of action.