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Mechanical Hobbies.

Almost every man has some foible, and it is a good thing that it is so. The man who never has an aspiration after things better, who never dreams nor doubts, is a poor mortal. He may do good in the world, to be sure, but it is only in a negative manner, like the rock that is chiselled by the artist—it is the delineation of a man, but, after all, it is only a stone. Give us a man with life in his soul—some vigor of thought and action about him, and although it be displayed in the most whimsical hobby, still we like him far better than the dull, ever-behind, thoughtless, hobbyless mortal, who has no thought of better things, and to whom the verb *to be* is a fathomless, dark nonentity.

We might speak of various hobbies, but we only wish to say a few words about mechanical ones. That was a most clever fellow of a Greek who could shoot peas through the eye of a needle—it was his hobby; it ended with himself, and that proved it to be a foolish one. Hero, of Alexandria, had a number of mechanical hobbies, but who dare say they were not more than trifles. His water blast, his experiments in steam, are living mementos of their author, who has slept in the grave for thousands of years. It is rather a common, wise, see-saw practice for people who cannot give a single reason for their opinions, to shake their heads at those fools, as they call them, who are possessed with the hobby mechanical. Dean Swift called Newton "a glass grinder, and maker of spectacles;" and he no doubt thought that his own most crazy reveries were Divine inspirations in comparison with Newton's mechanical contrivances—the embodiment of his thoughts in tangible forms and movements.

In every age there have been men with mechanical hobbies, and in every age to come they will find successors. The spirit we like, the practice we may condemn, at least so far as mere copying is concerned. It is true, that to produce works of art, to give the hand its skill, copying is positively necessary as a primary qualification, but we totally deprecate the hobby spirit which sees nothing beyond, and which strives for nothing better than the "what has been, or what is."

There are two mechanical hobbies which have possessed not a few men for a long time. There is no civilized country without its representatives in the class to which we refer, viz., the perpetual motion and rotary steam engine hobbyists. Within the past six months we have counted six patents granted in our country and England, for rotary engine inventions, happily none for perpetual motions—that being a somewhat reserved branch of patent discretion; but yet, for all this, we hear of a new perpetual motion about every two months. To invent a real perpetual motion—a mechanical one—is a hobby not to be despised, for it shows strong aspirations to do something better than has yet been done, but still it is as foolish a one as that of the Greek who became famous for shooting peas through the needle's eye—it is an impossibility. The rotary engine cannot be placed so low in the scale of hobbies as the perpetual motion, but still we believe that it is a vain waste of time in seeking for something better than the present, by working for the production of something far worse. Perpetual motion will only be discovered when the laws of inertia and gravitation are suspended; and rotary steam engines will supplant cylinder reciprocating ones, only when another form can be obtained superior to that of the round piston for packing, and for producing as little friction as it does, and this never will be. The form of a cylinder, with its round fitting piston, is the very finest and the only one adapted for distributing the power of steam economically to other machinery. If there is any fact stronger than another, to prove the truth of this averment, it is, that nearly one hundred patents have been granted for rotary engines—not two of which are now in actual operation.

We do not call up this subject to point to particular faults, but to direct the judgment to the consideration of "weighing all things well." It is not possible to enumerate faults neither is it our intention, we only throw out our views on the subject, and that not without cause, for we have perpetual motions presented to us almost every week, and rotary engines as often. A perpetual motion scheme is now before us, and it must have cost its author much time and study, and perhaps some sleepless nights; and yet it is one which is fully illustrated in the Marquis of Worcester's "Century of Inventions." In thus alluding to the principles comprised in mechanical inventions, we hope that we may be the agent of diverting some ingenious minds from a wrong to a right direction, and thus be the means of bringing something useful and enduring out of their *mechanical hobbies*.

The Coal Fields of the World.

No other country in the world is so richly favored with an abundance of coal as the United States of America. There are 124,735 square miles east of the Mississippi river, and 8,397 square miles west of it—this is all bituminous coal, comprising no less than an area of 133,132 square miles. In the State of Pennsylvania there are 437 square miles of anthracite coal. In all Great Britain there are only 8,139 square miles of bituminous coal, and in Great Britain and Ireland only 3,720 miles of anthracite. In British America there are 18,000 square miles of bituminous coal, which, by a most iniquitous monopoly grant, is lying almost as dead stock in the Provinces. Spain is richer in coal than any other nation of Europe out of England—she has 3,408 square miles; France 1,719, and Belgium 518, square miles. Although we have such vast coal fields, we use no quantity of coal at all in comparison with Great Britain. For domestic purpose we have had, and now have, such an abundance of wood, extending nearly throughout every part of our country, that we do not require coal, and will not for many years to come, especially in our northern rural districts. The annual production of coal, in Great Britain, is about 42,000,000 of tons per annum. In our country it is about 5,000,000 per annum—anthracite and bituminous. The production of American coal is becoming greater and greater every year. As we increase in population, the consumption of coal will increase in a greater ratio, for the use of wood is being curtailed year by year, consequently the coal consumption must not only increase with the increase of population, but also to supply the place of wood. Many of our farmers living within twenty miles of New York prefer coal to wood, and use it for fuel, while they have trees standing on their farms.

The coal fields of Britain are finely situated—none in the world can equal them for every purpose, both for ease of transportation and their proximity to iron and lime beds, for the manufacture of iron. Our resources in this respect, however, are but beginning to be developed, yet for foreign shipment, none of our fields, that we know of, are so convenient to the tide-water mark as those of England, but then we don't require them to be. Our great trade, and the one we must first look to, is our inland interior one. Our country is so extensive in area, and so various in climate, that we possess the sources of a great, it may be said, "foreign and domestic trade," within our own boundaries. At present but little coal is employed for locomotives. Wood is almost universally used. If coal was used in the form of coke, a greater amount of coal would be added to our productive list. It will yet come to this, for the forests are fast disappearing to fill the cribs of our iron horses.

The future presents a bright prospect for our coal trade. It was James Watt who said of Glasgow, stamping with his foot, "her wealth lies here," meaning her coal and iron fields. Well, it is just so with our country. Coal fields are more valuable than gold mines—we speak of essential value, for we could live and be lively without gold or silver, but not without coal to boil our tea kettles and warm our toes. Many years will not pass away, until we have railroads extending from

the Atlantic to the Pacific, and then there will be lines of steamships running from our far Western States across the Pacific to the Sandwich Islands, New Zealand, and China. All these will form one continuous steam line to Europe, by our Atlantic steamships; and then what an amount of coal will be necessary to keep up the steam.

Until the middle of the 18th century, nearly the whole of the great basin of the Mississippi, the valley of the Ohio, and the western slope of the Alleghany Mountains, constituting the great central coal-field of America, were partially occupied by Indian tribes; and for many years afterwards, this vast region was held to be of so little value, that the acquisition of the coal-fields did not in any respect influence the arrangements between the parties, made at sundry times by William Penn and his family, and subsequently by the proprietaries. By the treaty of 1768, the latter became possessed of nearly the whole area of bituminous coal-land of Pennsylvania, 'for the sum of \$10,000!' and about that time the presence of coal in certain places seems to have first become known. But it was not till 1828 that the first cargoes from the Alleghany coal-fields reached Philadelphia and Baltimore. Within the present limits of the city of Pittsburgh; in 1775, only a few cabins were standing; but, in our day, three-fourths of a million of tons of coals are annually received there; and the iron manufacture is so great as to confer upon the place the title of the Birmingham of America. Yet, vast as the produce is already in some places, it can scarcely be said to have begun; and it is impossible, to contemplate its gigantic proportions, and its enormous yet almost untouched resources, without being struck with the magnificent field it presents for future enterprise.

The great Pittsburg coal bed, running through the Monongahela Valley, is, in extent, half as large as all Scotland. The great coal product of our country is the anthracite; in England it is the reverse—the bituminous. More than three millions of tons of Pennsylvania anthracite is consumed every year; in England very little is used, and none at all, we believe, for family purposes. Pennsylvania, with her fine anthracite coal fields, has the prescience of greatness within her own bosom—no outward event but that of a natural increase of our population is required to ensure her solid progress in wealth and greatness. The states east of the Alleghenies must always be dependent on her for their fuel. What a change has been wrought in her since the good old days of straight-up-and-down William Penn. A century ago her coal region was a wild, stony country, termed the "Wilderness of St. Anthony," and for seventy-five years after, it was still the haunt of the bear and the panther; but now canals and railroads intersect it, and it is studded with villages of dusky-browed, hard-fisted coal miners, who dig out gold from beneath the rocks, and whose future success in this Pennsylvania wealth it is impossible to calculate.

The coal regions of Virginia are also very valuable, but have not been developed as they should be. Her vast beds of cannel coal will yet prove of more benefit to her than her gold mines. The coal beds of the great Mississippi Valley have scarcely been broached. They will yet form the grand sources of our coke manufacture for our locomotives and the manufacture of iron. The West—the Great West—what an illimitable prospect for thy progress. Without coal we verily believe that our nation never could arise to a very high elevation, either as a commercial or manufacturing one. We would rise to a certain point, and then stagnate for want of meat to send the blood through our industrial arteries. With coal no fears need be entertained about this, but every hope for a steady, sure, and certain progress in every department of national comfort, wealth and power. God has given us a country unequalled by any other for all natural resources, let us not fail to improve and be grateful for such blessings.

A lot of 4,000 sheep has been despatched from Senora to San Francisco, California, to exchange the mutton for gold.

Improvement in Tanning and the Treatment of Hides.

On our List of Patent Claims, this week, there is one of a *re-nou* for a new process of tanning, by a Mr. Hibbard of New York. We have seen a number of articles made from leather tanned by this process, and they looked well; whether they possess the enduring qualities of the leather tanned by the old process or not, we cannot tell, but there does not seem to be much that is new, at least about the tanning liquids, nor about the preparatory liquors either, but it often happens that great and good results are obtained by very simple means, especially in chemical processes. The Ohio Cultivator, in speaking of Mr. Hibbard's process, says:—"Mr. C. L. Whiting, of the firm of Vinton, Wright & Whiting, of Licking County, Ohio, exhibited to us, a few days since, specimens of sheep and calf skins tanned by this process; and the quality was such as to fully corroborate all that has been said in favor of the invention. Two of these gentlemen are experienced practical tanners, and they are firmly convinced that what has been claimed for it is true, to wit, that only about one-sixth of the usual time is required for tanning—that the quality of leather produced is vastly superior to any ever before offered in the American markets, including the choicest French and Turkish brands—that a saving of 20 to 25 per cent. of the cost of tanning materials is effected—and that the process is applicable to all kinds of skins and leather, including the heaviest article of sole and harness."

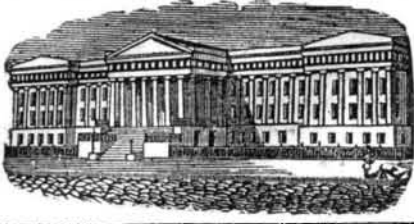
It has been stated that, by this process, the hair is removed from the skins in one-fifth the time usually required; that is, quicker than by the sweating process described in our last volume. It is also said that the skins are never changed in the tanning vats, only the strength of liquor kept up, by the addition of new and fresh liquors—such as oak or hemlock bark liquor, mixed with hydrochloric acid.

In connection with this subject, let us present some very important information relative to the removal of the hair from the hides, by a process recently brought before the Paris Academy of Sciences, by M. Boudet. While examining into the preparations of arsenical preparations used in France for depilatory powders; and also some of the preparations of the sulphuret of arsenic, lime and water, for the removing of wool from sheepskins, he found that neither the lime, arsenious acid, nor sulphuret of arsenic, had anything to do with the real result, but that it depended on the action of produced sulphuret of lime, formed by the re-action of lime on the sulphuret of arsenic. He proved that sulphuret of calcium (base of lime) acted powerfully for the removal of wool and hair from skins when employed alone. This suggested to him the employment of the sulphuret of sodium, or the hydrosulphate of soda (glauher salts) for the sulphuret of arsenic. This new agent succeeded beyond his hopes; so much so, that only a few hours after the application to a sheepskin, he detached the wool easily in one single sheet. The use of the sulphuret of sodium mixed with lime, for the removal of hair from hides, would be more expensive for the materials than Hibbard's process, but if a mixture of glauher salts (hydrosulphate of soda) and lime acts as a good preparation for the removal of hair, and we believe it is, the process may be a very cheap and good one. Some of our tanners should try it, as it is open and free for experiments.

Great Cave Discovered in Indiana.

A great cave has been discovered by a Mr. Coleman and others, about seven miles north of Leavenworth. The party who discovered it followed the main passage some four or five miles, according to their calculation, when they were admonished by their lights that they must return. On their way back, they visited some of the rooms which they had passed, in which they found large beds of epsom salts, in nearly a pure state. It also contains fine specimens of saltpetre, plaster of Paris, alabaster, &c., of which the party procured many fine specimens.

Vinegar and water is said to be an excellent wash for inflamed eyes.



Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS

Issued from the United States Patent Office. FOR THE WEEK ENDING FEBRUARY 12, 1851. To Charles Scofield & G. J. Johns, of Albion, Ill., for improved Scraper.

We claim the combination and arrangement of the scoop, standard, beam, arm, and handles, in such a manner, that when the scoop is tipped it will revolve sufficiently far to allow the earth to slide off, and then remain in such a position as that the operator, by a slight movement of the handles, can level down the earth with the scoop, and without the aid of another hand or another scraper, as herein described.

To Samuel & Morton Pennock, of Kennett Square, Pa., for improvement in Seeding Apparatus of a Seed Planter.

We claim the employment of the ring or cylinder, having projections on its periphery, in combination with the notched and toothed cylindrical gauge caps, constructed, arranged, and operated substantially in the manner herein set forth, for increasing and diminishing the size and number of the distributing receptacles, as represented.

We likewise claim the combination of the helical spring, screw shaft, flanged nut, and clamp nut, with the notched and toothed cylindrical gauge caps, to which the ends of the spring are attached, for turning the gauge cap, in order to change the relationship of the teeth or projections of one of the caps, with the teeth or projections on the adjacent cap, for enlarging the distributing receptacles as described in the foregoing.

We also claim the combination of the screw shaft, clutch nut, clutch washer, and clamp nut, with the toothed cylinder caps for enlarging or diminishing the distributing receptacles, as described.

We likewise claim the modifications of the distributing apparatus in their simplified forms, as represented, the several parts being operated in the manner herein set forth.

To Wm. O. Grover, of Boston, Mass., & Wm. B. Baker, of Roxbury, Mass., for improvement in Sewing Machines.

We claim the use of two needles, operating alternately, one working vertically and the other horizontally, substantially as above described, and uniting two pieces of cloth, or forming the seam, by means of the double loop stitch, as set forth.

To John Osborn, of Hamden, Conn., for improvements in operating the Water Gate in Hydraulic Rams.

I claim the use of the regulating slide and nut, or other similar arrangement, in combination with the levers, wires, springs, rods, weights, or other devices, substantially similar to those described, for adjusting the waste valve, and operated on and in connection with a float at the spring or source, which float rises and falls with the water.

I also claim the use of the hammer, resting or falling on a springing piece for opening the waste valve, or starting the hydraulic ram, and worked as described, or in any other similar manner.

To J. E. Ware, of St. Louis, Mo., for method of securing ranges of short plank pavements.

I claim the method above described, of securing ranges of short pieces of planking of a street or road, in longitudinal lines, over water or gas pipes, by means of screws or keys with staples, aided by the double bevel of the short planks and the ends of the permanent interval planks, severally holding and permitting of the easy removal of such short piece.

RE-ISSUES.

To Harmon Hubbard, of Harrietta, N. Y., (assignor to Wm. W. Reid, of Rochester, N. Y.,) for improvement in Tanning Leather by tanning and acids, previously patented Oct. 16, 1849.

I claim the process of removing hair and wool from skins and hides, and of liming them, so called, preparatory to tanning, by the use of a composition of lime, wood ashes, or potash, and of salt, called Composition No. 1, in the manner above described.

I also claim the use of a composition of lime and wood ashes or potash, without the salt, but I do not claim either of these materials separately by itself.

Second, I claim the process of tanning hides and skins, by the use of any kind of tannin, in combination either with the muriatic acid of commerce, or with muriatic acid, generated by a mixture of sulphuric acid and salt in water, with the tannin, in the manner substantially as described.

Mr. Burke and the Reform of the Patent Laws.

The Washington Republic, of the 13th inst., contains an able letter from the Hon. Edmund Burke, Ex-Commissioner of Patents, defining his position on the Bill now before Congress, for reforming the Patent Laws, from which we select a few extracts. He says:—

"I express myself in very decided terms against that class of persons technically denominated 'pirates,' who knowingly and wilfully appropriate the inventions of others to their own use; and I also recommended a modification of the patent laws, introducing, among other reforms, the process of *scire facias*, by which good patents may be established, and void and fraudulent ones vacated and set aside.

I am in favor of all proper legislation to reach the *wilful* infringer, and also set aside and avoid all patents, original or re-issued, fraudulently, surreptitiously, or illegally obtained, which are a nuisance to the public, a detriment to the true inventor, and which bring disrepute upon the patent system, threatening, in the revulsion of public opinion against it, to sweep it entirely from existence. And with these views I am in favor of Mr. Turney's bill, with the modifications proposed by the Hon. Mr. Norris, from New Hampshire, which will, in my judgment, amply secure both the meritorious patentee and the public in the enjoyment of their mutual rights.

I am aware that from certain sources, by no means including the class of meritorious inventors, but from persons unjustly holding old patents that have been extended or re-issued with enlarged claims, much opposition is made to Mr. Turney's bill. There are some sections in it which merely confirm by legislation reforms in the mode of keeping records in the Patent office, which were introduced while I was Commissioner. It does no harm to confirm those reforms by legislation, nor is it essentially necessary. But they are, indeed, unimportant parts of the bill, and may, without much detriment to the public, be stricken out.

But there are provisions in that bill, and in the amendment proposed by Mr. Norris, which, in my judgment, should be passed as well for the protection of the patentee and the patent system itself as the public; for I hold to the opinion that the public has rights to be protected as well as the patentee.

Section 4 of the new bill provides that, in surrenders for re-issue, the new patent shall embrace only those matters contained in the original specification, drawings, or model. This is certainly right. To go beyond it would open the door to innumerable frauds upon the public and upon individuals.

It also provides that all machines or articles of manufacture, made or begun before such re-issue, may be used and sold.

This feature is violently attacked. But is it not just? Who is to be blamed, and who is to suffer, if the patentee, by negligence, or by the incompetency of his agent, shall have failed to notify the public, in his claim, of the extent of his rights—the innocent individual unconscious of wrong, who invests his capital and his labor in a manufacture which is *claimed by nobody*, or the negligent patentee who

has failed to give notice to the public, in his claim, of the extent of his invention. That sense of justice existing in the bosom of every honest man will respond that the negligent patentee must suffer, if any one."

[This is very true, but Mr. Burke knows that many patentees have had their claims unjustly curtailed by the Patent Office. We know of some.]

"Section 8 of the bill provides that, when applications are made for re-issues, additions to, or extensions of patents, notice shall be given, and that persons interested may come in and oppose such applications.

When the fact is brought to mind that there is but little responsibility in the examining branch of the Patent Office; and that reissues may be made, if they have not already been, improperly not to say surreptitiously, in spite of the vigilance of the Commissioner, notice to the public, and the privilege of opposing re-issues, (as the public are now permitted to oppose extensions,) seem to me to be eminently just and reasonable.

If such notice had been required when I was Commissioner, a certain well known patent, which has caused much excitement in the country, would never have been re-issued, particularly in the form in which it now exists, and which in my judgment, covers what the original patentee never invented nor claimed. It was done in my absence, and under circumstances which throw very dark suspicions over the propriety of the transaction, so far as the party, the agent, and examiner are concerned. Notice to the public, with the privilege to any person to come in and oppose, would put an end to all such proceedings in the Patent Office."

[The remark about the re-issue relates to the Woodworth patent, we believe. Due notice is now given for extensions, but not re-issues and additions. It is no use to embrace additions. Why? Because they will be applied for as new improvements, and it is just as necessary for public notice to be given for new applications. No harm however can result from inserting the clause.]

"Sec. 9 provides that all re-issues and extensions obtained either of the Commissioner of Patents or Congress, surreptitiously or fraudulently, shall be subject to examination in courts of justice, and vacated, if justice require.

This provision is rendered necessary by the conflicting decisions of the courts. In the northern circuit the judges have decided that, in matters of re-issue, the Commissioner is the sole judge, and his decision is binding on courts as well as individuals, unless fraud has been practised on him. Such an interpretation of the law gives no opportunity to correct the errors of that officer founded on mistake or misconduct, if the latter may be supposed ever to occur.

On the other hand, in the Maryland district, a doctrine conflicting with the one just stated is held, and the defendant has been permitted to try before a jury the question whether or not the re-issued patent is for the same invention as that covered by the original patent. Should not these conflicting decisions be reconciled? And should not the official acts of the Commissioner of Patents in any case be subject to revision in courts of justice? I can hardly see how an objection can be raised against a proposition so reasonable.

It remains now to consider the *scire facias* for the repeal of a fraudulent or illegal patent, provided for in section 5. The section, as proposed to be amended, gives the right to any person, as in England and France, to sue out the *scire facias* to repeal a patent. It gives the right to a prior patentee to repeal a subsequent patent which infringes his, as well as to any individual interested in any trade or manufacture to repeal a patent, interfering with his business, which he believes to have been unjustly or fraudulently granted. It requires security for costs in the proceeding, and notice to all parties interested in sustaining the patent to appear and defend the same. If the proceeding is not sued out and prosecuted in good faith, it authorizes the court to order a non-suit. If suits, or proceedings in law or equity, are pending in any court of the United

States against the person suing out the *scire facias*, it suspends them until the fate of the patent is decided. On the other hand, it compels the person contesting the patent to keep a true account of all profits accruing from the invention in dispute, in whatever part of the United States he may be using the same, and to give ample security that he will pay them over to the patentee, if the latter shall ultimately prevail. In short, it confines the great battle between the parties to a single district, and thus tends to put an end to litigation. Can provisions be more just and equitable between the parties? I think not.

It also provides that, in a second proceeding of *scire facias*, the party suing out the same shall give bonds to respond both costs and damages, in both the *scire facias* and action of infringement, if one may be pending, thus preventing infringement by irresponsible persons.

In my reports I expressed the opinion that one trial in a *scire facias* should perpetually establish the patent. I think, on mature reflection, that such a provision would be too stringent upon public right. Every lawyer, at all acquainted with the practice under the patent laws, well knows that matters avoiding a patent may not come to light for years after it has been issued. Therefore they should always be available, to vacate and set it aside.

I have now given a true view of the bill as it will stand with the amendments offered by Mr. Norris. And, if I am capable of judging the matter, I think they will guard the rights of both the patentee and the public; and they conform mainly to the views expressed in my reports.

[These views of Mr. Burke are well worthy of attention; they impress us with a feeling that the Bill will pass. We would direct attention again to the views we have expressed in Nos. 18 and 19.

Patent Case—Planing Machine.

In the U. S. Circuit Court, Boston, on the 8th inst., before Judge Sprague, in the case of Joseph P. Woodbury vs. E. G. Allen and Joseph G. Russell, the Jury returned a verdict in favor of Russell, there being no proof that he was concerned with Allen in the manufacture of the machine alleged to be an infringement of the plaintiff's patent, but disagreed as to Allen, and were excused. R. Choate and J. Giles for the plaintiff; Wm. Whiting for the defendants. The Court adjourned until Friday, Feb. 21, at 10 A. M.

Iron of the United States.

The most valuable mine is one in Salisbury, Connecticut, which yields 3,000 tons annually. The mines in Dutchess and Columbia counties, in the State of New York, produce annually 20,000 tons of ore, Essex county, 1,500 tons; Clinton, 3,000; Franklin, 600; St. Lawrence, 2,000; amounting in all to more than \$500,000. The value of iron produced in the United States in 1835 was \$6,000,000, in 1837, \$7,700,000.

In Ohio 1,200 square miles are underlaid with iron. A region explored in 1838 would furnish iron sixty-one miles long and sixty wide; a square mile would yield 3,000,000 tons of pig iron; so that this district would contain 1,000,000,000 tons; by taking from this region 400,000 tons annually, (a larger quantity than England produced previous to 1826,) it would last 2,700 years, as long a distance certainly as any man looks ahead! The States of Kentucky, Tennessee, Illinois, Maryland and Virginia possess inexhaustible quantities of iron ore. In Tennessee 100,000 tons are annually manufactured. Notwithstanding our resources, more than one half of our cutlery hardware, railroad iron, &c., is still imported from Great Britain. It is supposed by geologists that the weekly supply of gold from our own mines will be equal to the demand, and that our own mines will yet be more profitable than the mines of Brazil and Columbia.

Russian Candles.

In Russia the candles used in the mines are made of tallow mixed with charcoal dust, (or powdered charcoal), which is found to increase the intensity of the light.