2d. Manganese is most extensively used in the manufacture of chlorine so as to prepare a bleaching liquid or powder, the consumption of which by the paper and cotton manufacturers is unlimited.

3d. Next in importance is the manganese largely employed in the green flint glass works in precipitating the iron, and when added in excess to produce an amythyst color in flint glass.

4th. Steel manufacturers require manganese for producing a hard and tough product; a half pound to fifty of iron will have the effect.

5th. Linseed oil is rendered more siccative by the addition of manganese, and is called a patent dryer for paints and varnishes.

6th. A permanent black on earthenware and pottery is obtained by exposure to heat.

7th. A black enamel used in ornaments by jewelers is likewise produced with manganese.

8th. The manufacture of permanganates, a powerful disinfectant, and the main material in the new oxygen light is obtained from the same.

9th. The quality of spirits, with or without distillation, is obtained by the use of maganese.

10th. The chameleon mineral used in sugar refining is prepared with manganese.

The consumption of manganese for the manufacture of the new gas light about to be introduced in this country, forms a new epoch in this direction. It is to be converted first into the alkaline manganate, which acting as a sponge alternately absorbing the oxygen of the air and again releasing it, must require if successful, not less than one hundred thousand tuns of manganese in order to produce a million of cubic feet of oxygen gas, and I gather the following particulars from the programme issued by the inventors, Messrs. Tessie de Motay and Marechal of Metz: "The manganates are decomposed at a temperature of 600 deg. Fah., by the action of a jet of ordinary steam which liberates the oxygen and leaves a residuum composed of sesquioxide of manganese and the alkaline base contained in the combination. The manganate is regenerated by submitting the above mentioned solid residue to the action of a current of air at the same temperature as used in the decomposition, and all these operations are conducted in a series of retorts placed in a furnace where the manganates, after being raised to a temperature of 600 deg. Fah., are alternately submitted to the action of a jet of steam and current of air which restores to the mass the oxygen has lost. The oxygen is disengaged by the steam from retorts; this steam is liquified by pressing into a condenser, and the pure oxide is collected into a gasometer. When applied for the production of light, oxygen in combination with common coal gas permits a reduction in the consumption of the latter, but at the same time giving an equal quantity of light in the proportion of 16 to 1.

The permanganate of potash or Condy's disinfectant is recommended as a powerful agent in obtaining pure drinking water and in epidemic diseases. But by far the largest amount of manganese is consumed by the manufacturer of bleaching powders. England alone consumes 80,000 tuns for that purpose per annum, and as soon as the United States becomes independent of the English imported chloride of lime for bleaching the cottons and the papers, not less than one half million tuns will be consumed for the desired object, for on examining the report of the director of the bureau of statistics, I find that 12,682 tuns of bleaching powder have been imported the first five months of the year at the value of $324,066.

NOTES ON THE VELOCIPEDE.

Our exchanges teem with items of all sorts concerning the velocipede. We are also in receipt of many letters of inquiry and suggestion with reference to the construction of the machine, some of them unpractical, others containing useful hints. One correspondent suggests the making of a vulcanized rubber rim to velocipede wheels, so that they could be run over Belgian pavements without shock to the rider, and the propeller wheel could also gain superior tractive power. Some very ingenious and peculiar devices are now on their way through the Patent Office, and will, if successful, make this little iron horse "a horse of another color," if we mistake not in our predictions.

A lady, writing from Georgia, wishes manufacturers to take into special consideration the wants of ladies. She says that the awkward position they are now forced to assume astride the front wheel, is a serious objection. She suggests a velocipede for two persons. It might have seats something like a side-saddle facing in opposite directions and be propelled by the combined power of the two riders, each on her own side of the wheel. This suggestion is worthy consideration, but, for our own part, we don't think it would work well with two female riders. There can be no doubt, however, that good sport could be had by a gentlemen and lady on a machine of such construction.

As is the case with almost every new invention, there are those who wish to make out that it is a discarded experiment of the past; but we do not believe the velocipede of the past could compare either in principle or nicety of construction with the two-wheeled machine of the present.

We have in our office a colored engraving of the velocipede of 1819, described in an English journal as follows:

This machine was of the most simple kind supported by two light wheels running on the same line; the front wheel turning on a pivot which, by means of a short lever, gave the direction in turning to one side or the other, the hind wheel always running in one direction. The rider mounted it and seated himself in a saddle conveniently fixed on the back of the horse (if allowed to be called so), and placed in the middle between the wheels; the feet were placed flat on the ground, so that in the first step to give the machine motion the heel should be the part of the foot to touch the ground, and so on with the other foot alternately, as if walking on the heels, observing always to begin the movement very gently. In the front before the rider was placed a cushion to rest the arms on while the hands held the lever which gave direction to the machine, as also to balance it if inclining to either side when the opposite arm was pressed on the cushion.

It will be seen at once that the "little difference" in the manner of propelling this machine and the modern one, completely changes the character of the vehicle. The ridicule which assailed this machine was not without foundation; the motion in propelling it was not graceful, and it was said to give rise to numerous cases of rupture.

Not so with the velocipede of the present, which glides along as though it were alive, and with a smooth grace alike exhilarating and beautiful to behold.

An English paper gives a description of a velocipede calculated to convey from six to a dozen people. It has four wheels for carrying and propulsion, and a fifth guide wheel, which acts upon a lever or pole, and cramps two of the wheels precisely as the fore wheels of carriages are now cramped in turning. Each pair of carrying wheels is provided with double cranks which are connected with each other by longitudinal treadle bars, so that all can aid in propelling the machine. This velocipede is provided with cross seats having backs like one of our Yankee market-wagons. It has not been tried yet, but it is stated that a club is being organized to manipulate it.

Performances with them are coming into fashion at the theaters. In the Parisian theatrical world considerable sensation has been caused by velocipede performances, and even some curious acrobatic exercises are gone through with them. A notice in the Paris journals recently stated that not more than twelve velocipedes should be allowed "at one time" on the stage. Chicago has followed suit, and the habitues of Crosby's Opera House have been treated to velocipede exhibitions between the other portions of the entertainment.

There also was a velocipede race at Pike's Music Hall in Cincinnati recently. A silver cup worth $100 was given to the fastest rider, and another, also worth $100 to the slowest rider.

An exchange says, that a day or two since, a certain gentleman in Chicago, who has been practicing for some time on the side walks, at vespertinal hours, came out upon Indiana avenue, and throwing down the gauntlet of defiance, dared a street car driver to race with him to Thirty-first street, the terminus of the track. The challenge was gallantly accepted by the car driver, although the latter had several lady passengers on board. The race began auspiciously, the horses being driven at a furious pace. The velocipede soon gained upon its competitor and bade fair to distance it when an unlucky crack in the sidewalk received the fore wheel, leaving the other, in obedience to the law of its momentum, to turn a somersault, throwing the rider into the gutter. The car won the race on a "foul."

Rural districts are catching the mania. A velocipede school has, we learn, been established in Bridgeport, Ct., but it is said that the nearest approach to a velocipede that has been seen in Danbury was a bit of orange peel, on which a citizen went across a sidewalk and down a pair of stairs in just 1¼ seconds—the quickest time on record.

Winslow Homer's last drawing for *Harper's Weekly* is very original in conception. He makes the New Year come in on a velocipede!

Mr. Dana, of the *Sun*, has become, it is said, one of the most expert velocipedists in the city. It is also asserted that he advocates a project to build an elevated railway from Harlem to the Battery, to be used only by the riders of velocipedes. By this means it would be possible to go from one end of Manhattan Island to the other in about an hour, making allowance for delays from stoppage and accidents. A good rider, with a clear track, would easily accomplish the distance in half an hour; but, with a well-filled road, progress would necessarily be slower. The proposed roadway ought to be at least thirty feet wide, upon an iron framework; with a flooring of hard pine. By all means let us have the "elevated roadway," and let the sidewalks be kept clear for pedestrians, who are otherwise likely to be endangered by the carelessness or awkwardness of velocipedists.

We regret to record that the Park Commissioners have prohibited velocipedes in the Park. The reason assigned is that the drives are narrow and horses are likely to become frightened. Then, why, Messrs. Commissioners, do you not widen the drives without delay? The Park was made for the public not the public for the Park. The drives are too narrow, anyway, especially on the east side of the Reservoir, and as we believe it is intended to widen them, we do not see good cause for postponing the work. As to frightening horses the following, from a correspondent of the *Herald*, is practical and suggestive:

The *Herald* is right. Velocipedes ought to be admitted to the Park. And why not? In the year 1855 I spent nearly four months in Paris, and occasionally saw velocipedes passing rapidly through the Champs Elysees and along the boulevards without exciting much attention either from man or beast. The horses did not appear to notice them at all. I was in Paris again last spring and found the velocipede mania raging with considerable force, and these vehicles were commonly to be seen upon the most frequented streets and public places of the city. The horses were not afraid of them. Yet, if you will allow me to say so, I am not quite sure that this state of things would hold good in our parks. It is noticed by all travelers that a runaway is a rare occurrence in Paris. Indeed, this remark holds good respecting all other cities in Europe. I have spent nearly two years of my life in Europe, and in all that time I never saw a horse run away. On my first visit to the Park after my return, in June last, I saw the fragments of no less than three light geared, heavy top buggies scattered along the roadway, and it is not uncommon, I am told, to have ten or fifteen injured persons brought in on a single day to St. Luke's Hospital, victims of smash-ups in the Park.

There is something radically wrong either in our driving or in our system of breaking horses. Probably both are faulty. And here, I suggest, is a subject for a searching inquiry.

Adulterations in Tea and Coffee.

The New York *World* has been applying its editorial nose to the tea chests and coffee bags, as well as the whisky barrels of New York, and finds much to offend. It says:

We heard, not long ago of one of the great tea houses buying in a cargo of damaged tea from a vessel which sunk in the harbor. It was properly doctored and fixed up, and put into the market afterwards. A common adulterant of genuine teas is exhausted tea leaves. A few years ago there were eight manufactories for the purpose of re-drying exhausted tea leaves in London, and several others in various parts of the country. The practice pursued was as follows: Persons were employed to buy up the exhausted leaves at hotels, coffee houses and other places at 2 1-2d. to 3d. per pound. These were taken to the factories, mixed with a solution of gum, and re-dried. After this the dried leaves, if for black tea, were mixed with rose pink and blacklead, to "face" them, as it is termed by the trade. The same practice is pursued in this country.

Perhaps the most general mode of adulterating the better grades of coffee in New York is by the admixture of inferior coffee. The Java is, of course, rich and comparatively expensive. The common South American coffee is cheap, has a flat aroma, and a bitter taste. When the berry is burnt it cannot be readily distinguished from the Java berry, and, of course, identification is lost after grinding takes place. We are informed that a new adulterant has been discovered in sweet potatoes, and that it is becoming quite popular with the sellers of ground coffee. It has the right color and taste, and it is not easily detected without the microscope. The common adulterant for coffee, however, is chicory. The use of chicory is openly acknowledged in some places, and even defended by grocers on the score of health and economy.

We have medical testimony that chicory is extremely injurious to health. Dr. Hassall says that taken constantly, prolonged and frequent use produces heartburn, cramp in the stomach, loss of appetite, acidity in the mouth, constipation with intermittent diarrhea, weakness in the limbs, trembling, sleeplessness, a drunken cloudiness of the senses, etc. Again, it is the opinion of an eminent oculist in Vienna, Professor Beer, that the continual use of chicory seriously affects the nervous system, and gives rise to blindness from *amaurosis*. Its use ought, therefore, to be discouraged, and grocers who sell it for coffee ought doubly to be put under the ban.

An Earthquake Convention.

A convention called by joint committee, on the Investigation of Earthquakes, has been held in San Francisco, with a view to the adoption of an improved system of building and other precautions against future disaster from earthquakes. The following report of its proceedings is from the *Bulletin*:

Mr. Gordon explained that the laboring oar in the investigation must fall on the two secretaries, and gentlemen had been selected having peculiar qualifications for the position, and who could give their entire time to the business in hand. Professor Rowlandson would bring the experience and critical knowledge of a man of science, and Mr. Bridge, a practical architect and builder, a vast fund of information in relation to investigations and experiments with mortars, cements, etc., gained while with General Gilmore, United States army.

The President called for reports from the sub-committee No. 1, on bricks, stone, and timber.

General Alexander, chairman, reported that the committee had made some preliminary investigations as to the qualities of brick, and had put on foot inquiries as to the propert es of brick made mostly from sand, which had been highly spoken of in the Eastern States. He had no hesitation in saying that, as a rule, the brick used in the city were not good. Better brick can be made with the same material by using proper proportions and knowledge in burning, etc. He cited from his own experience a case in point, where a large kiln of brick had been condemned as defective, and from the same material, under his supervision, a very superior article had been made; the difference being in proportions and in burning.

Sub-committee No. 2. on Limes, Cements, Mortars, etc., Colonel Mendel, chairman, reported that they had the matter in progress, but were not prepared to make any extended report. Granted further time.

Sub-committee No. 3, on Structural Designs, General Alexander, chairman, reported progress from the committee, who were granted further time.

The President made some incidental remarks on the advisability of recommending some plan by which structures already erected can be strengthened by iron bracing, to resist any subsequent shocks, instancing the plan he was adopting in bracing the sugar refinery, etc. The matter was discussed by General Alexander, Colonel von Schmidt, Dr. Blake, and Judge Rix. On motion of Mr. Rix the matter was referred to the Committee on Structural Designs.

Sub-committee No. 4, on Scientific Inquiry, etc., Dr. James Blake, chairman, reported that the committee had met, and the investigations had been commenced. In this connection a letter was read by General Alexander from R. C. Hopkins, Custodian of the Spanish Archives in the Surveyor-General's office, stating that the archives were at the disposition of the committee in any investigation they might wish to make, and offering his services as translator, etc. The matter was referred to the same committee.

A discussion followed on the value of these old records on the subject under consideration. From remarks made by Prof. Rowlandson, it appeared that the old Mission records had been pretty well searched by Dr. Trask, Dr. Tuthill, and others. Mr. Hittell, of the *Alta*, stated that he had personally inspected these old manuscripts, with this very object in view, and found them very meager and unsatisfactory. On motion of Major Elliot, Colonel Williamson, United States Engineer, was placed on the Committee on Scientific Inquiry.

A letter was received from W. Frank Stewart of San Jose, accepting the invitation to serve on this committee. On motion, the gathering of facts connected with the earthquake in the vicinity of San Jose, was intrusted to Mr. Stewart.

FOOD REQUIRED TO SUSTAIN LIFE.—Judging from the minimum quantities of food upon which an ordinary individual is capable of existing without suffering in health, it would seem that about 4,100 grains of carbon and 190 grains of nitrogen are required in his daily diet. These proportions have been determined from a large number of observations, as by those of Dr. Lyon Playfair, in his inquiries into the dietarics of hospitals, prisons, and workhouses, and by those of Dr. Edward Smith, in his examination of the amounts of food upon which the Lancashire operatives were capable of living during the cotton famine, and also by his inquiries into the dietaries of indoor laborers.

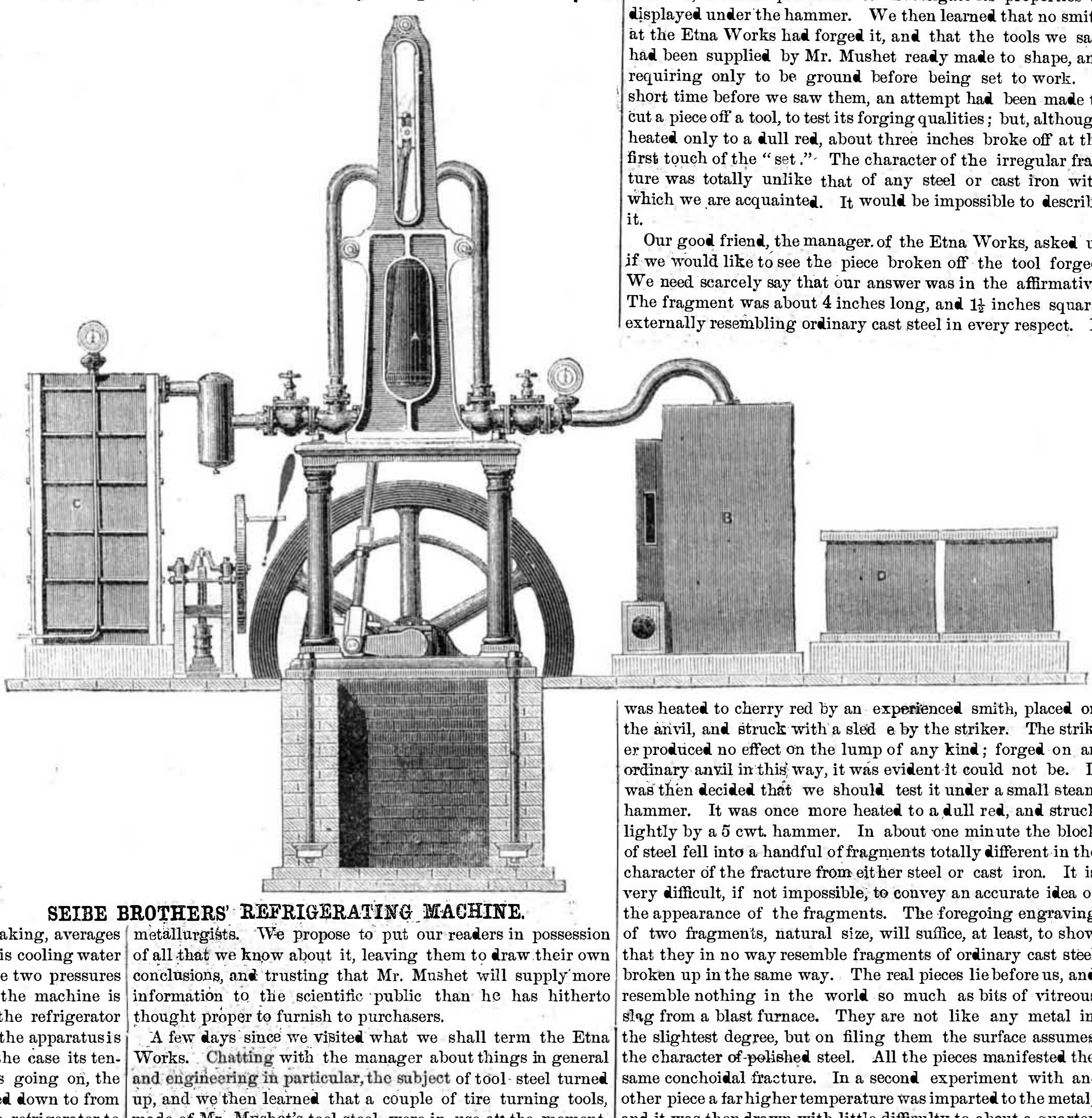
English Ice-Making Machine.

We copy from the London *Engineering* the illustration of a device for producing ice, or for cooling liquids, by the evaporation of a volatile liquid under low pressue or in a vacuum.

We copy from *Engineering*: Referring to the engraving, A, is the double-acting air pump; B, the refrigerator; C, the condenser; and D, the ice troughs. The refrigerator, B, may be described as a kind of vertical multitubular boiler, the tubes of which are, when the machine is employed for ice making, traversed by a stream of strong brine, this brine being replaced, when the machine is used for cooling only, by the water which is to be cooled. The tubes are of thin copper, and are of small diameter, whilst by an arrangement of diaphragms the water or brine is made to traverse the length of the refrigerator several times. The liquid ether from the condenser is admitted to the lower end of the refrigerator, and, in consequence of the vacuum formed by the air pump, it there evaporates, absorbing heat from the brine or water. The vapor arising from the evaporation of the ether is drawn off by the air pump from the top of the refrigerator and transferred to the condenser, which consists merely of a coil of pipe inclosed in a wooden tank containing water. In the condenser the ether vapor, which has become heated by its compression, parts with its heat and becomes liquefied, the liquid ether thus obtained being, as we have said, transferred through a pipe back again to the refrigerator for re-evaporation.

The machine is used sometimes for ice making and sometimes for cooling the water used in ordinary refrigerators on the establishment, and it is for the latter purpose that it can be used most economically, as we shall show presently. The air pump of the machine is 20 in. in diameter with a stroke of 37 in., and it is driven by a 15-horse non-condensing horizontal engine at a speed of 40 double strokes per minute. The general arrangement of the air pump is, as will be seen by our engraving, similar to that of a table engine, the cylinder being placed in a vertical position on an entablature, beneath which the crank shaft, by which the machine is driven, is situated. The smallest practicable amount of clearance is allowed between the piston of the pump at the ends of the stroke and the cylinder covers, and every care is taken to arrange the valves so that the capacity of the waste space which the pump is unable to clear of vapor at each stroke is reduced to the smallest possible amount. So well has this been done, that the pump is capable of producing a vacuum of 29 in. of mercury; but the vacuum which ordinarily exists in the refrigerator, when the machine is in regular use for ice making, averages 26 in. of mercury, and that when the machine is cooling water only about 20 in. The difference between the two pressures last mentioned is due to the fact that, when the machine is employed for ice making, the ether vapor in the refrigerator falls to a much lower temperature than when the apparatus is used for cooling water only, and this being the case its tension is also less. Thus, when ice making is going on, the brine passing through the refrigerator is cooled down to from 10° to 18° Fahr., and is, in fact, returned to the refrigerator to be cooled when at a temperature of 32°; whilst, when water only is being cooled, the temperature does not fall below about 39° or 40° Fahr.

The pressure in the condenser varies from 2 lb. to 3 lb. per square inch, according to the supply and temperature of the water used for condensing purposes. With an abundant supply of water, the pressure in the condenser would, when the machine was ice making, be practically nothing; but the existence of a slight pressure in no way interferes with the working of the machine, but merely throws a little extra work on the pump. It may be noticed here, as a distinctive feature of Messrs. Siebe's machine as compared with the refrigerating machines acting by the expansion of compressed air, or by alternate production and liquefaction of ammoniacal gas, that no parts of the apparatus are subjected to severe pressure. The 2 lb. or 3 lb. pressure per square inch in the condenser may be considered to be practically nothing, whilst the refrigerator is subjected to a collapsing pressure only, and that, of course, cannot exceed, however nearly it may approach, the pressure of the atmosphere. With such low pressures as these, there is, of course, no difficulty, by the aid of good workmanship, in making all joints perfectly tight, and thus guarding against loss of ether. As the heat generated by the compression of the ether vapor is considerable, the stuffing box through which the piston rod passes is kept cool by jets of water, and similar means are employed to cool the delivery valves.



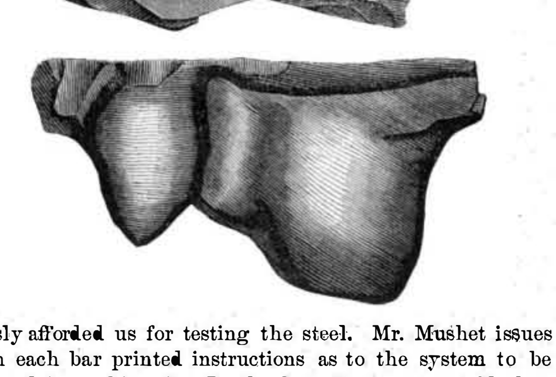
SEIBE BROTHERS' REFRIGERATING MACHINE.

SOMETHING NEW IN STEEL.

It has long been a disputed point where steel leaves off and wrought iron begins; but it is generally received that the difference between steel and cast iron is so great that no doubt can exist as to which is which. Within the week we have proved to our own satisfaction that it is just as difficult to distinguish between cast iron and steel, as it is to define those characteristics in which steel differs from wrought iron. There is, indeed, at this moment, a so-called steel in the market, which possesses such extraordinary attributes, that the metallurgist may well feel in doubt under what head it should be classed. To all intents and purposes it is a new material, and as such it claims the attention of our readers.

For some time past Mr. Mushet has advertised a "special tool steel" warranted to last—we are afraid to say how much longer than any other steel, worked in the same way and in the same shape. Our readers may have seen these advertisements, and passed them over as legitimate trade puffs. In this they were wrong. The material—be it steel, cast iron, or some alloy—is, in reality, one of the most singular substances we have ever met with, and it possesses qualities which deserve the attention, not only of engineers, but of analytical metallurgists. We propose to put our readers in possession of all that we know about it, leaving them to draw their own conclusions, and trusting that Mr. Mushet will supply more information to the scientific public than he has hitherto thought proper to furnish to purchasers.

A few days since we visited what we shall term the Etna Works. Chatting with the manager about things in general and engineering in particular, the subject of tool steel turned up, and we then learned that a couple of tire turning tools, made of Mr. Mushet's tool steel, were in use at the moment, which we were assured possessed such qualities, that managers, foreman, smiths, and turners were alike at a loss to comprehend the nature of the material with which they had to do. Our curiosity was excited, and every facility was court-



eously afforded us for testing the steel. Mr. Mushet issues with each bar printed instructions as to the system to be adopted in working it. In the first place we are told that, after forging or otherwise working the tool steel, it is to be suffered to cool slowly, and under no circumstances to be quenched and tempered. Now, it is well known that the hardest ordinary cast steel may be softened so much by heating it to a bright red and suffering it to cool slowly, that it will not retain a sharp edge for two minutes. In other words, its temper may be drawn. We proved, on the other hand, that the temper of Mr. Mushet's "special tool steel" cannot be drawn. After being heated red hot and suffered to cool slowly, it still remained harder than any ordinary cast ste l tempered at straw color. The proof of this lies in the fact that a tool of the best ordinary cast steel required to be ground three times in planing a given area of hard cast iron, whereas a tool of Mr. Mushet's steel not only planed a similar area without regrinding, but remained to all intents and purposes nearly as sharp as when it began. It is rather more brittle than ordinary steel, in so far that a different angle, slightly more obtuse than t at commonly employed, must be given to turning tools, but it certainly is not objectionably brittle. In the shape of chisels, we have no experience of its qualities whatever.

Having satisfied ourselves of its good qualities in the shape of a tool, we next proceeded to investigate its properties as displayed under the hammer. We then learned that no smith at the Etna Works had forged it, and that the tools we saw had been supplied by Mr. Mushet ready made to shape, and requiring only to be ground before being set to work. A short time before we saw them, an attempt had been made to cut a piece off a tool, to test its forging qualities; but, although heated only to a dull red, about three inches broke off at the first touch of the "set." The character of the irregular fracture was totally unlike that of any steel or cast iron with which we are acquainted. It would be impossible to describe it.

Our good friend, the manager of the Etna Works, asked us if we would like to see the piece broken off the tool forged. We need scarcely say that our answer was in the affirmative. The fragment was about 4 inches long, and 1½ inches square, externally resembling ordinary cast steel in every respect. It was heated to cherry red by an experienced smith, placed on the anvil, and struck with a sled e by the striker. The striker produced no effect on the lump of any kind; forged on an ordinary anvil in this way, it was evident it could not be. It was then decided that we should test it under a small steam hammer. It was once more heated to a dull red, and struck lightly by a 5 cwt. hammer. In about one minute the block of steel fell into a handful of fragments totally different in the character of the fracture from either steel or cast iron. It is very difficult, if not impossible, to convey an accurate idea of the appearance of the fragments. The foregoing engraving of two fragments, natural size, will suffice, at least, to show that they in no way resemble fragments of ordinary cast steel broken up in the same way. The real pieces lie before us, and resemble nothing in the world so much as bits of vitreous slag from a blast furnace. They are not like any metal in the slightest degree, but on filing them the surface assumes the character of polished steel. All the pieces manifested the same conchoidal fracture. In a second experiment with another piece a far higher temperature was imparted to the metal, and it was then drawn with little difficulty to about a quarter of an inch square. It was hardened in the usual way, and did not fly, so that it is possible that in small masses it will bear hardening. The little piece is so intensely hard that no file will touch it. A lump of the same steel an inch and a quarter square cracked in all directions when heated and quenched.

What is this material? Is it steel or cast iron? Under the hammer it behaves more like cast iron than anything else; as a tool it behaves as neither cast iron or steel ever behaved before. To all intents and purposes it is a new metal. Mr. Mushet has not patented its mode of production, which he reserves as a secret. That it contains an enormous quantity of carbon is, in a sense, proved by its hardness. Why does not this carbon render it as brittle as cast iron? Is the carbon combined or graphitic? Is the "steel" simply an alloy of iron with some other metal? What is the proper method of forging it in ordinary smith's fires? These and some other questions present themselves for solution. The only conclusion we can arrive at, and we confess we do not believe it to be the correct solution of an interesting problem, is that Mr. Mushet first forges his tools or bars from a hard cast steel of the ordinary kind, and then, by some process such as recementation, imparts an additional hardness to them, which, although it makes the tool as such invaluable, renders the bar from which tools should be made, as such, useless in the hands of all but first rate smiths.—*The Engineer.*

DYEING AND COLORING.—We invite attention to the article on another page written for the SCIENTIFIC AMERICAN, by the well known Dr. M. Reimann, of Berlin, author of a valuable work on "Aniline and Aniline Colors." We hope during the year to publish several articles from his pen.

IT is said that the largest distillery in the United States has just been finished near Lexington, Ky. It will be able to make 2,400 gallons of whisky per day. Thirty other distilleries in the same district will begin operations January 1st, and their aggregate daily product is estimated at 25,000 gallons.