it would require more power and consequent expense than would be profitable.

Now admitting it could be done as easy and speedily as you can turn over your hand, would that make it any better? No; Sirs. It would only turn out an imperfect and crippled wheel, and we would never get through resetting the tire on the same wheel done by this method, as the reaction of the wheel against the tire would help to loosen it.

Now as to the expense of labor saving, the old method, or the one we work by at present, will also have the advantage in my opinion.

The inventor of this new method surely cannot be a practical wheelwright, or if he is he does not understand the action of the force which the axletree of a vehicle exerts upon its wheel.

A wheel has almost as much (and sometimes more) strain to bear from the horizontal force (caused by the weight) as from the perpendicular. Now the dish in a wheel is to the effect to resist the horizontal force which is brought to bear upon the hind part of the hub, and the more dish the greater is the resistance.

An arch would illustrate this principle well. It is a fixed fact that the more crowned or rounded an arch is constructed the greater weight it can bear. So it is with a wagon wheel. Its dish should be regulated according to the weight it has to carry. Now how can a wheel be expected to stand up to its load when the dish is strained into it. Would not the reaction of the spokes favor the horizontal strain of the axle against the hub and destroy the wheel?

I could enumerate a great many more minor objections which I have to this new method, but I think I have said enough to convince any one of its entire fallacy, both scientifically and naturally.

I don't mean to say that the apparatus with which the inventor conducts his work and sets the tire, is beneath any notice. Not at all. It must be a very ingenious contrivance and well worthy of attention, if he can set a tire cold upon a wheel and do a good job. E. QUAST.

Freedom, Mo.

Railroad Accidents by High Wind.

MESSRS. EDITORS:—Occasional accidents by trains lifted by gales of wind and thrown from the track, may render a simple safeguard desirable. A recent case of this kind occurred at Boston Corners, on the Harlem Railroad. A high velocity makes the train more subject to this action of the wind than slow motion; for revolution or motion at a great velocity detracts from the weight of bodies, as a spinning top, leaning in any direction, plainly shows. This is more obvious even if the rapidly vertically revolving heavy top, or wheel, is supported only at one end of the horizontal axle, and kept in suspense till slackening of the speed permits it to drop. Locomotives are known to have leapt at a high speed horizontally across the chasm of open drawbridges, etc. The bending of the iron rails under a passing locomotive or car at low speed, may be considerable at slow motion, but imperceptible at high speed. Pieces of a bursting grindstone or fly wheel, or of an exploding boiler, or in a gunpowder explosion, are almost invariably hurled upwards. The boomerang of the New Zealander practically applies the same fact. Whatever the explanation of the phenomenon, the facts are established beyond controversy, that a great velocity of bodies detracts from their weight.

The prevention of the above railroad accidents may be found in slacking speed at places particularly exposed to the fury of a sweeping gale. R. H.

How to Braze a Band Saw.

MESSRS. EDITORS:—I send you a method of brazing band saws, which may be of some use to some of your numerous readers.

The tools required are a small portable forge, brazing clamps, etc., and a straight edge, 4 or 3 ft. long, also some small brass wire, and powdered borax. Take the saw and cut it to the proper length, scarf the ends from one half to three fourths of an inch, then put the saw in the clamp (I would say that I use a very small and simple clamp in the shape of a double vise), keeping the back of the saw out of the jaws of the vise, or clamps, and apply the straight edge to the back, as it is very necessary to braze it straight. Make the fire in as small a compass as possible, place the clamps directly over the center of the fire, and then put on three pieces of brass wire, bent in the shape of the letter U, so that they will pinch the laps together; put on as much borax as will stay on the saw; cover the whole with a piece of charcoal; let the brass melt so it will flow over the saw, before taking it off the fire, and cool very slow so as not to make the braze brittle. File off what brass remains on the saw, and it is ready for use.

I send you a piece of saw that has been in use several months, and has never broke in the braze.

RUSSELL WHITNEY.

Fitchburg, Mass.

[The sample sent is good evidence that the method described by our correspondent is an excellent one.—EDS.

The Choking of Gas Mains by Naphthaline.

MESSRS. EDITORS:—In my last communication, I endeavored to substantiate the view, that the destruction of the wood-preserving establishment, in Brooklyn, occurring on the 26th of October, must have been caused by the obstruction of the pipes, leading from the still into the chamber containing the timber, with naphthaline. In glancing over Colburn's "Gas Works of London," I find the following passage, which bears relation to the subject, and which I therefore quote here: "We ought here to notice the presence of the vapor of naphthaline in gas, and which begins indeed, to deposit in thin, micaceous-looking scales of exceeding lightness, almost at the moment when the gas leaves the purifiers. Indeed, large patches of naphthaline flakes may often, if not generally, be found on the undersides of the lids of the purifiers themselves, and this singular substance will often choke the largest main so as to almost entirely prevent the passage of the gas. A blast of steam turned into the mains will disperse the obstruction, but a sort of chimney-sweeping contrivance, called a 'cat,' is oftener employed to open the great routes of communication between the gas works and the consumers. Fortunately, too, naphthaline is seldom deposited at any considerable distance from the works, and it can generally be cleared out without going off the premises." ADOLPH OTT.

New York city.

Improvements in Farm Implements.

MESSRS. EDITORS:—During the summer you requested any of your readers to suggest improvements in farm implements, or anything else that was practically useful. In accordance with that request, allow me to make the following suggestions:

The only objection to our corn planters is that they drop the seed in a *lump*. There are two objections to this. First, the greatest enemy a plant can have is one or more of its kind growing close to it, thereby using the same nutriment. The second is, that the plants cannot be weeded or hoed as conveniently as if separated to a proper distance. I therefore suggest that inventors make a planter to drop the seed at least three inches apart in a line, thus: . 3 . 3 . A machine to do this properly will supersede all others as well as the old, yet, so far, best plan of hand dropping.

There is a great want of some practical, effective, and cheap plan of attaching three horses to one plow. It is much needed in deep or trench plowing, which, in conjunction with draining, must be resorted to in old and high-priced lands to make them pay.

We also want some of those English steam plows (it is a disgrace to inventors that we do so), with attachments, to do the mowing, harvesting, and thrashing. We can then furnish England cheaper wheat for her plows.

We want an arrangement to water beef cattle and other stock in the cars in transit from shipping points to Eastern markets. This will be a much better sanitary measure than excluding good, healthy, and cheap beef from the southwest. It seems as if the breeder of fancy stock feared the competition of Western stock, which would certainly cheapen beef for millions of operatives. The road that first adopts this plan will receive the preference over all others. This plan is in use on many of the English roads where the distances cattle are carried are short, and the climate mild compared to that of this country.

I suggested the present horse corn cutter some years ago, and now it is nearly perfect. JAS. HARKNESS.

St. Louis, Mo.

Filing and Setting Mill Saws.

MESSRS. EDITORS:—I have noticed recently several articles upon filing saws, hand and cross-cut, but nothing about mill saws.

I have been running and superintending saw mills several years, both circular and sash saws, and my experience is, that a bevel-pointed tooth is the best for general use. In filing, I hold the file at an angle of 10 degrees on the bottom or front of the tooth, and square or flat on top; changing sides or hands every alternate tooth, then bending or setting the tooth point outward sufficient to keep the saw clear. This method obviates the necessity of swaging, which is a great saving in time and labor.

I have gained much information from the SCIENTIFIC AMERICAN, but have never written you before.

Eufaula, Ala. JAMES R. POSTON.

Valuable Testimonial Letters.

MESSRS. MUNN & CO., *Gentlemen*:—Your esteemed favor of the 10th, inclosing certificates of allowance of English and French patents on my high and low-water detector, was received on Thursday.

The very satisfactory manner in which cases are prepared by your Patent Agency, and your facilities for obtaining American and foreign patents is certainly all the inventor could desire. On the 11th day of August, 1857, my first patent was issued from the U. S. Patent Office, through your Agency, since which time I have obtained *thirteen* American and *eight* foreign patents; *sixteen* of which were obtained through the Scientific American Patent Agency. In every instance I have found your drawings and tracings artistically executed, specifications able and full, and claims broad; and in no case have you failed to obtain a patent on my petition.

In conclusion, I began to assure you, that it will always be a pleasure to me to be able to advance your interests as patent attorneys and mechanical journalists, knowing as I do, that the inventors' interests will always be safe in your hands.

Very respectfully, your obedient servant,

G. B. MASSEY.

New York city, Nov. 12, 1869.

A Voice from the West.

Gentlemen: I was agreeably surprised to-day on receiving a letter from you stating that my patent was allowed. You have done your work nobly and well. I can but return you my sincere thanks for your promptitude and energy in conducting my case, and I must confess you have converted me into a walking advertisement for your interests in this wooden city of ours.

Your valuable journal and I have been companions for the last five years, and now I cannot live without it. It has grown with me from boyhood, and I've always found it instructive and entertaining in my journey through life.

Chicago, Ill., Nov. 13, 1869. J. F. DUFFY.

For the Scientific American.

OXYGEN AS A SOURCE OF HEAT AND LIGHT.

BY ADOLPH OTT.

Heat and light, in their application to the manifold purposes of life, are subjects of vast importance. As regards heat, an inexpensive process for producing high degrees is much in need; and with respect to light, it is a brighter and cheaper form of artificial light that is not liable to charge the air with carbonic acid which is wanted.

The brilliancy of illumination, as well as the high degrees of temperature afforded by the combustion of various gases in oxygen has, for many years past, led to zealous attempts to produce this gas at a cheap rate. There is, indeed, no want of oxygen; it exists in immense quantities. The atmosphere surrounding our globe consists of one fifth in bulk of this gas, and eight ninths of the weight of water, of which there is also no scarcity, is oxygen. But, in spite of all efforts bestowed upon the opening of these magazines for the uses referred to, the problem of the cheap separation of oxygen has only lately been solved.

This discovery is due to two enterprising Frenchmen, Messrs. Tessié du Motay and Maréchal; and it first excited attention at the time of the late Exhibition at Paris. Two substances, one a mineral, the other a product of manufacture—peroxide of manganese and chlorate of potash—have ordinarily been the source of oxygen; this gas can be evolved from them with ease; however, this process is too costly for use in the industrial arts. Besides this, various methods for producing oxygen have been proposed up to the year 1867. The one best known is, perhaps, that of Boussingault, which is founded upon the regeneration of the binoxide of barium. However, this process is now abandoned, chiefly on account of the cost of the crude material.

Some years ago, Messrs. Saint Claire Deville and Debray were requested by the Russian Government to search for a better process for separating platinum from its ores. This metal can only be fused before the oxy-hydrogen flame, and there being large quantities of oxygen needed, a new mode of generating it, had to be sought for. The one proposed is based upon the property of the sulphate of zinc—a by-product of the cells of galvanic batteries—to split up into oxide of zinc, sulphurous acid and oxygen, when subjected to a red heat.

The separation of these two gases is easily effected, since the one is absorbed by water while the other is not. The production of oxygen from the source referred to is very regular and unattended with danger; moreover, it is economical as compared with those commonly employed by chemists; in the experiments of Deville and Debray, the cubic meter (35·316 cubic feet) of oxygen when prepared from chlorate of potash could not be obtained for less than ten francs (two dollars in gold); from manganese for not less than four francs, and in the last-described process, the price of one cubic meter amounted to only one franc and a half. By the discovery of Messrs. Tessié du Motay and Maréchal the cubic meter of pure oxygen may now be produced for less than four cents, gold; at least it is sold to the gas companies in Paris for twenty-five centimes (five cents, gold) per cubic meter. We are consequently in possession of a process by which oxygen can be got at only one fiftieth of the cost of that ordinarily employed by chemists in their laboratories!

The process of the French chemists is founded upon the fact that the manganate of soda at a red heat gives off a part of its oxygen when steam is passed through it, and that it re-absorbs oxygen when atmospheric air is passed through it. This process may be represented by the following formula:

2 ($Mn O_3 Na O$) (manganate of soda) + 2 H O (water) = $Mn_2 O_3$ (oxide of manganese) + 2 Na O, H O (hydrated soda) + 3O (oxygen).

According to this formula, the manganate of soda is capable of producing fourteen and a half per cent of oxygen in weight, and since the oxygen is 737 times lighter than water, from one hundred pounds of the crude product there can be generated 1,348 gallons of oxygen, or something over five hundred cubic meters.

With regard to the application of oxygen for illuminating purposes, it was first made in the square fronting the Hôtel de Ville, one of the finest government buildings in Paris. This experiment, which lasted for about two months, not only met with perfect satisfaction, but also procured the patronage of his Majesty Napoleon III., who, for a second trial upon a still larger scale, ordered the court of the Tuileries to be illuminated by means of the oxy-hydric light. The grounds of that palace comprise in themselves an area of 30,000 square meters; besides, it has been introduced into one of the most spacious theaters of Paris, "La Gaité," in the Alcazar, and in various stores and workshops.

The light itself is produced by directing a jet of a mixture of oxygen and hydrogen or oxygen and street gas upon cones of zircone, a white earthy body, which has proved far superior to either lime or magnesia, that serves in the Hare, Drummond, or Calcium light.

As regards the lighting power, it is seven times greater than that produced by an equal quantity of street gas; indeed, the streets may be so brilliantly lighted with it that a newspaper can be read with perfect ease in a street car. Dr. Miller states that the oxy-hydrogen light can be seen at a distance, in a right line, of 112 miles. Navigable rivers might be cheaply and perfectly lighted their whole length;

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and for churches, workshops, theaters, and other spacious rooms, there is perhaps no mode of illumination better adapted than the new light. And, since the flame, when directed upon a solid, earthy body, it produces an emission of luminous, instead of caloric rays the objection that it would heat, the room in which it is burned, falls to the ground. But, in another point of view, the new light is far preferable to any other form of artificial light—we mean in regard to health. According to experiments recently undertaken by Dr. Zoch, in Germany, the quantity of carbonic acid produced by a common gas flame in a room of the capacity of 2,540 cubic feet, may rise to the proportion of three parts to the thousand—a quantity generally supposed to be possible only in hospitals, prisons, and garrisons; and what shall be said when it is considered that, in an ordinary parlor as many as three burners are kept constantly lighted for five and six hours and with an inferior quality of gas at that? With respect to the oxy-hydric light, since the product of combustion is simply watery vapor, no vitiation of the air can possibly take place.

As regards the application of oxygen for the production of heat, it may be stated that hydrogen, when being inflamed with oxygen, generates the highest heating effect known, with the exception of that of the electric discharge. This is due to the rapidity of the combination of these gases. Some years ago, by the construction of a close furnace of lime, and the use of the oxy-hydrogen blowpipe, MM. Deville and Debray were able, not only to volatilize many of the supposed fixed impurities in commercial platinum, but with about forty-three cubic feet of oxygen they have succeeded in melting twenty-five pounds of platinum in less than three quarters of an hour, and casting it into an ingot, in a cake mold. And much larger quantities of platinum have more recently been fused by the same means. According to Brand and Taylor, silica and all metals are fused, and some of them entirely dissipated in vapor by the intense heat produced under these circumstances.

The temperatures of various flames are, according to Prof. Bunsen:

Oxy-hydrogen flame	14,541°	Fah.
Hydrogen	5,898°	"
Carbonic oxide	5,507°	"
Coal gas	4,262°	"

There remains no doubt that oxygen will soon play an important part in various branches of metallurgy, and those fully conversant with its properties, predict for it not less conspicuous uses in other branches of art.

"HOW TO OBSERVE THE SUN."

[By J. N. Farrar, D.D.S.]

On page 310, current volume, I noticed an article alluding to a former one on page 189, "Storms on the Sun," for the purpose of showing simultaneous "electric disturbances" about our planet, which gives further hints of a simple and good method for obtaining a comparative correctness of statistics of the solar disturbances noticed through a telescope, by means of reflecting them upon a screen. I will quote two paragraphs:

"Believing that a simple means of observing and accurately recording solar phenomena could induce amateurs as well as professionals, to keep such records, I respectfully propose the following method, which I never have heard of being thus used by any one before. Take an astronomical reflecting telescope with a Huyghenian eye piece, into a dark room, direct it on the sun through an aperture, push in the eye piece until it is between the object glass and its principal focus, now place a fine white screen at some distance from the eye piece and focus sharply, a large, clear, well defined, erect image of the sun is thus obtained, which may be enlarged or diminished at will, arrange the aperture, increasing or decreasing the light, until the finest details are visible. The sun can now be examined without darkening glasses, and by several persons at once.

"For uniformity of record I would suggest the adoption of one regular size, say a circle inscribed within one square foot divided into square inches; the space being numbered from right to left, and from top to bottom. The exact position of any disturbance observed could thus be easily ascertained and recorded."

The idea of reflecting solar spots, etc., upon a screen, is excellent but not new. While attending the Elmira Astronomical Observatory, at Elmira, N. Y., during the spring of 1862, and desiring to make some solar observations, this plan was adopted for most of them, but was not original with me. The writer is under the impression that this process is old.

I made a long series of observations on the sun at this time, and with considerable effort made a different sketch of the sun's appearance every day, when the weather would in any way permit, and at exact time. My reflected representation of the sun was about ten feet in diameter, and my pictures were made one foot in diameter. The central spot or nucleus was made with black ink, the penumbra with lead pencil, while the faculæ were represented with white crayon. It must be understood that straw colored paper is essential for the best representations.

The disturbances of the solar photosphere are very interesting to young students, and are becoming more interesting with all astronomers, as the time approaches for the great expected display of spots of 1871, when, from all accounts, the sun is to become quite "speckled," or at least great magnetic disturbances are looked for.

Sometimes (though rarely) no spots are visible on the sun, again, one may be seen, at other times quite a large number may be seen scattered all along the equatorial belt of 70 degrees in width. Spots outside of this belt are very rarely seen. The disturbances of the luminous portion of the solar atmosphere, if I may be allowed to use the term, are noticed upon the screen in curly streaks of bright light, in irregular shapes, resembling waves on a lake during a sunny, windy day, and particularly plain near and around the spots, resembling much the tumult and circular waves round a place where a large stone has been dropped into a pond of water.

I noticed, whenever I saw a good deal of facular disturbance, in any quarter, there generally followed spots in a few hours. This is so characteristic that it is easy to foretell the appearance of some larger spots, one or two days before they appear around the approaching limit, that is, before they appear in sight, as it is supposed all know the sun revolves on his axis once in 25·34 days, which continually brings new spots into view.

Some days scarcely any facular disturbance could be noticed on the ten-feet reflection on the screen, while on other days it could be distinctly seen covering the whole zone of 35 degrees each side of the equator.

On January 27th, the same season (1862) my brother, in company with myself, noticed the whole face of the solar orb covered with enormous disturbances of the photosphere. from pole to pole, and from limit to limit, entirely mottled with wave-like shades. On this occasion fifteen spots were visible, two of which were very large; undoubtedly a more powerful glass would have revealed many more. The faculæ on this occasion like most other days were more agitated and greater as they approached the equator.

The instrument used in these observations was Fitt's 8-in. Acromatic Equitorial Telescope, erected by Professor C. S. Farrar.

I used a prismatic eye piece to reflect the object upon the screen. Although these representations were very good and convenient, yet I found I could get a finer line and more correct idea from views seen directly through the telescope, by using two or three colored glasses between the eye and eye piece. This is, however, a dangerous plan, as the colored glasses sometimes break from intensity of heat, and the loss of an eye may be the result, as has been the case before. Great care should be exercised in viewing the sun directly through a powerful telescope.

The proposition of a checkered field upon which to throw the image of the solar orb seems to me good. The writer would kindly suggest in addition to the plan of the author of the article above mentioned, that the cross line check be made comparatively small and light, and be secured to the telescope, so that it will keep pace with the motion of the earth on its axis, and hold the whole picture upon the screen in juxtaposition, and not necessitate a constant adjusting anew of the telescope, as would be the case if the screen held the lines, having prepared everything in this manner, a comparatively accurate sketch of every visible disturbance can be conveniently made in a book, whose pages are correspondingly checked.

[For the Scientific American.]

THE MANUFACTURE OF LOOKINGGLASSES AND MIRRORS.

One of the most singular wants of man, but especially of woman, is to devise means to ascertain how her personal image appears. From the fountain, in which Narcissus looked at himself, to the bureau with lookingglass, many plans have been tried.

The first artificial mirrors were made of metal, and were discovered at a very early period, and must have been contemporaneous with the art of polishing flat surfaces.

At this date, lookingglasses are used every where—even as ornaments on horse collars, in Europe.

As ornaments, lookingglasses look beautiful, reflecting, as they do, daylight and artificial light, and thereby flooding sumptuous apartments with a deluge of light. They seem to enlarge small apartments. When not silvered, but simply polished and left transparent, they give to store fronts and windows a cleanly and bright appearance not attained by common window glass. Used between two parlors, they are one of their most beautiful applications. Since the wonderful invention of Daguerre, and especially, latterly, large quantities of small cast glasses are made for photographic purposes. As to imperfect glasses, not suitable for polishing, they are used to form walls through which light freely traverses to rooms which require to be lighted but closed; they may also be used for floors, roofs, etc., etc.

The use of lookingglasses has increased wonderfully, and this increase is owing, in great part, to a notable reduction of price. the consequence of an invention of Abraham Thérart, a French artist, who, in 1688, conceived the bold undertaking of casting glass as it was practiced with metals. This new manufacture made such wonderful strides that, three years afterwards, a company was formed to carry out this new manufacture; and, in 1691, the establishment was transferred to St. Gobain, where it is in existence to this day, and is manufacturing a very superior article. St. Gobain, by the beauty of its glasses, by their relative cheapness, and the ability of its managers, has retained the monopoly, almost exclusively, of the French market, and has, besides, maintained a rank abroad not to be excelled by others, notwithstanding the active competition of Belgium and England. This factory has six strong competitors in England, especially in lookingglasses used for windows. The oldest is located at Raven Head, near St. Helens, South Shields. The Thames Co., the British Co., and three other factories, two of them situated in Lancashire, and the last one at Smitherick, near Birmingham, with the two first named, manufacture more than two hundred thousand square meters per year. The most important factory of the Continent, after St Gobain, is situated at Sainte Marie d'Oignies, near Charleroi, in Belgium.

In 1860, St. Gobain alone manufactured two hundred thousand square meters; the six English factories, three hundred and fifty thousand meters; Belgium one hundred and ten thousand, and Manheim seventy thousand.

The lookingglass manufactures, in France, have a capital of 50 or 60 millions engaged, and employ 5,000 workmen simply on the manufacture of the glass proper, not including those employed on the separate branches of business depending upon it. This branch of manufacture has attained such a state of perfection, that, at this day, prices are 60 per cent lower than twenty years ago and 32 per cent lower than five years ago.

From experiments made, the following shows the relative position of French and Belgian manufactures.

To manufacture a square meter of glass, the following is required:

(In Sainte Marie d'Oignies, Belgium.)

To melt 118 kilogr., soft coal at 13f. 50c. tun	2f. 38c.
" polish 195 " " " 8f. 58c. tun	1f. 65c.
Total	4f. 03c.

(In St. Gobain, France.)

To melt 180 kilogr., soft coal	3f. 96c.
" polish 195 " " "	2f. 94c.
Total	6f. 90c.

If we complete the estimates of the last price by adding the price of the chemicals, the sand, the chalk, and the potmaking, and by adding the labor, we arrive at the following cost prices of one square meter:

Sainte Marie d'Oignies, Belgium	17f. 54c.
Ruquignies, France	20f. 34c.
St. Gobain	21f. 61c.
Cirey	23f. 97c.
Montlugon	21f. 61c.

By adding the interest on the capital invested, the last price is raised to 27 or 28 francs per meter, and is sold in Paris at an average of 34 to 35f.*

It is a well-known fact, that the United States, with its immense resources for this branch of manufacture, has not succeeded, yet, in producing a merchantable article in this line. What is wanting, then, to manufacture it successfully here? We have sands, beautiful and much superior to the European article, although England draws a large quantity of it all the way from Australia; we can manufacture our sodas in this country as cheap as in Europe; we have coal in plenty; we have the capital; therefore what we want is men capable of managing the work and skillful workmen. Ability and love of work are oftener wanting than capital. This class of men, however, is often left at the mercy of men unacquainted with the business, and oftentimes of bad faith, who can not, or will not, wait for the slow but sure profits of labor, and who simply take hold of the business as a speculation, as it were, caring nothing about the artistic excellence of their employés, but would part with them at any time if they thought they could make a dollar by it. These, I think, are a few of the reasons that discourage skillful men from coming to this country.

A manufacturer of lookingglasses would find it to his advantage to locate near the ocean, where he could receive his raw materials, and would be near large markets for his wares, and could, also, make up some of the materials used in manufacturing. Saint Gobain, in France, manufactures its own sodas, emery, colcothar, and tin sheets. They buy the tin in Amsterdam, from the Dutch Indian Company. This company only sells at wholesale. They get the mercury from Spain.

If we cite these facts, it is to establish a comparison between a factory located in Europe, and one in this country, and to show the advantages of a location on the ocean border. We will give an example of these advantages. Sodas might be made on the spot, and would thereby save a vast amount in freights, as soda is obtained from sea salt by transforming it into sulphate of soda, then the sulphate into carbonate. In this latter state it contains a large quantity of water—from 62 to 66 per cent—so that 100 pounds of this salt represents only 34 to 38 per cent of dry carbonate of soda. A factory, making this carbonate on the spot, would save the freight, not only of the pure carbonate, but, also, of the 6-10ths of water it contains.

We have, in some of the Southern States, sand suitable for glass-making, and, also, fire-clay suitable for making the pots (crucibles), which have not been tried properly, heretofore, but, by being properly mixed, would answer the purpose as well as the German clay that we import at a heavy cost.

We therefore say, unhesitatingly, that a lookingglass manufactory, well managed, must be profitable in this country.

Washington, D. C. J. P. COLNE.

WATCH-SPRINGS.—It has recently been discovered that the springs of chronometers and watches, which are constructed of steel, are frequently magnetic. Steel is at all times liable to become magnetized from causes beyond man's control. Watch-makers are advised to test their springs as to magnetism by placing them near to a very small and truly balanced mariner's compass. If the spring exhibits in none of its circumference any tendency to move to one pole of the compass more than the other, it may be considered free from magnetic influence; on the other hand, if the North pole moves to one part, and the South pole to the other, the spring is decidedly useless; for in whatever position the time-keeper may be placed with such a spring, it will be affected by the earth's magnetism.—*Septimus Presse.*

*A square meter equals one and one fifth square yards, nearly. A kilogramme is two and one fifth pounds avoirdupois nearly. A centime is one hundredth of a franc.—EDS

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