fire of an enemy. This class of torpedo consists of an iron upon human beings. In his experiments he employed anicask, part of which contains the charge and fuse, and the remainder is the air space for buoyancy. It is held in position, a few feet beneath the surface of low water, by a chain, which is secured to an iron mooring block. Two or more lines of mines are necessary: they can be fired by the enemy striking them, or by electricity at the desired moment when two observers, stationed at points well situated for getting lines of intersection, note the enemy exactly over the position of a mine. Each torpedo might contain 250 lbs. of gun cotton. We may suppose 100 feet spaces to exist between neighboring mines on the same line, and some 500 feet spaces between each of the lines crossways, over which series of two or three independent lines an enemy would have to pass before entering the harbor. Should the first explosion fail, the torpedo on No. 2 line will be fired as soon as the vessel crosses, and finally, if necessary, the torpedo on No. 3 line. The inside line would usually be supplied with circuit closers in addition to the means of firing them on cross bearings and signal; these circuit closers being always rendered active when darkness or thick weather sets in. To insure the greatest accuracy in firing the torpedoes by cross bearings, telescopic firing keys have been designed, so that all that is necessary is for the observers to watch the approaching vessel through the spyglass, and, whenever its movement brings the firing key over one of the points, the position of a mine, to press it down to close the break in the circuit.

The only way to clear an entrance into a harbor through this defence is by means of countermines suspended from 1 part aniline red in 100,000,000 parts alcohol, gives an imcasks or buoys, drifting them either by the current or the wind into the desired position, and then exploding them. A charge of 500 lbs. of gun cotton is calculated to destroy all submarine mines within an area having a radius of 120 yards.

ARE THE ANILINE DYES INJURIOUS TO HEALTH!

This important and interesting question has been answered in various ways, affirmatively, negatively and equivocally. H. Seidler, technical director of the mineral water establishment at Riga, delivered a lecture recently before a scientific society of Riga, from which we abstract a few important points:

In testing whether aniline colors are poisonous the following questions may be asked:

1. Are the dyes made of materials which are of themselves poisonous ?

2. Does a certain quantity of these injurious substances remain in the dyes when finished ?

3. Can the chemically pure dye itself act as a poison?

4. Is food colored with the pure dye poisonous?

5. Do fabrics (such as clothing and carpets) dyed with these dyes, exert a poisonous influence on the body?

1. In answer to the first query, he says: In the manufacture of aniline dyes, or more correctly, of rosaniline dyes, crude products are employed which do exert a very poisonous effect upon the animal system. Nitrobenzol, aniline oil, and the different oxidizing agents, such as mercurial and arsenical compounds, are extremely poisonous substances.

2. By careless purification, the dyes, when finished, can contain one or more of these poisonous substances. The dye may, under some circumstances, act as a poison and produce forms of disease due to aniline, mercury, or arsenic poisoning. Numerous cases like this have already been noticed. If the aniline dyes come into market in a more or less amorphous state, en pate, or in solution, we can almost always assume with certainty that they contain more or less of those poisonous substances employed in their manufacture. If they are sold in a dry state, either in powder or beautiful crystals, they are more likely to be pure, although arsenic may always be present, as the purification of dyes made with arsenic acid is tedious and involves inextricable difficulties and expense. The most carefully purified brand of dye, the Oa of Gehe & Co., Dresden, contains solve part, or .00125 per cent of arsenic.

A number of technical chemists have attempted to drive out arsenic acid and other poisonous metallic compounds from the aniline manufacture, and have sought to work without the use of these substances. This problem was in greater part solved by Coupier of Poissy in 1869. Coupier made the aniline red by allowing pure aniline, nitrotoluol, hydrochloric acid, and a little metallic iron, to act upon each other at a suitable temperature. Commercial aniline

line red (Rubin from Brueckner, Lampe & Co., Leipsig) made by the nitrobenzol process. A qualitative analysis showed the absence of any metallic compound whatever. Doses of 0.05 grains (.75 grains) or of 0.1 grain produced no uneasiness, and when # grain was taken every morning for five weeks, not the slightest injurious consequences were perceptible. Experiments were made on two other persons with like results. This proves pure aniline dyes to be innocuous. The experiments permit of the supposition that Rubin (aniline red) passes through the animal system as indifferent matter, and is removed in a short time (two or three days) with the excrement undecomposed.

the pure dyestoff is per se non-injurious, liquors and lemontaken by Seidler, without injury.

dark red; 1 part aniline red in 10,000 parts alcohol, is very red; 1 part aniline red in 100,000 parts alcohol, is red; 1 part aniline red in 1,000,000 parts alcohol, is distinct pink; 1 part aniline red in 10,000,000 parts alcohol, is pale pink; perceptible coloration, which can be seen by holding a white screen behind the vessel containing the solution.

This divisibility is employed for the greater part in coloring drinks, as lemonade, liquors, etc.

In 100 liters of lemonade, which contains 135 whole bottles of lemonade, there are 13 c. c. of a 1 per cent. solution, so that there is less than a milligram (or $\frac{1}{70}$ grain) of aniline red dissolved in a bottle of lemonade. Hence, a man would require to drink 100 bottles of lemonade to obtain as much aniline red as Seidler and another person took at once in a concentrated form.

The question involuntarily presents itself, can the arsenic in fuchsin be injurious, if the aniline colors are employed in such extreme dilution for coloring drinks, etc.? This is best answered by a simple example. Suppose a manufacturer colored his spirituous liquors with fuchsin containing 10 per cent. of arsenic, a case which never happens. A person that consumes 100 c. c. (nearly a gill) daily would take only 0.02 milligrams (.003 grain) of arsenic. This quantity cannot be considered injurious.

If a careless manufacturer colored his lemonade with analine red containing 1 per cent. of analine, each bottle of lemonade would contain 01 milligram (00015 grain) arsenic.

For coloring eggs, aniline red is employed in a concentrated form. Here it is ordered that the purest possible dye, free from arsenic, must be employed, and druggists are only allowed to sell pure wares for this purpose. The presence of 0.00125 per cent. of arsenic could do no harm.

5. Have fabrics dyed with aniline a poisonous influence on the body? In general it is to be assumed that pure dyes, of themselves, exert no injurious effect on the epidemics, and this supposition is justified in so far as this, that as yet, have any illness or skin disease been observed, although the skin, hair, and nails of these people are so deeply dyed that much less than is the case with ordinary spectroscopes. the ordinary articles used in washing are unable to remove the intense coloration.

We have farther to consider that the aniline dyes belong to the class of so-called substantive dyes, that is, themselves away by mechanical means, as for example, ball dresses, curtains, carpets, etc., dyed with arsenite of copper-Paris green.

Farthermore, we have as yet no perfectly-well authentisuffered injury to their health thereby.

in dyeing fabrics, no danger need be apprehended. In dye- like extent. The results obtained prove that the deposit of ing, it is well known, that all kinds of goods are very care- copper per foot-pound augments with the number of baths. oil, which is a mixture of aniline and toluidin, mixed with fully washed before they come in the market ; and, farther, In the third series the intensity of the cement was maincommercial nitrobenzol and nitrotoluol, may be employed it does not seem probable that fabrics dyed with these would tained constant, while the surface of the anodes and, at the with the hydrochloric acid and iron. The red obtained in contain aniline as such, or metallic salts, after such wash same time, the number of the baths were augmented. These both cases is identical with ordinary red. Meister, Lucius ings, in quantities sufficient to injure the skin. & Brunnig in Höchet, near Frankfort-on-Maine, have overuneasiness, the same is not true of goods printed with aniline | are employed. In the fourth series, insoluble anodes were come the difficulties that opposed the introduction of the nitro benzol process into practice. The Berlin Actiengesallcolors. In the latter case, the dye is employed in a more used. A smaller deposit per foot-pound and considerable or less concentrated form, and it is quite possible that it polarization resulted. schaft fuer Anilinfarbenfabrication uses Coupier's process exclusively, and makes 200 kilos (440 lbs.) of rubin daily. might be rubbed off mechanically, and thus enter the mouth, M. Gramme's note throws some new light on the question 3. Numerous experiments have been made in regard to stomach, and intestine canal. Chemically pure dyes are, of of galvanic deposits, and his experiments will be of much the effect upon the animal system of pure aniline dyes, course, free from danger. If, however, the aniline dye con-service to the industries in which magneto-electro-machines which contain no poisonous substances mechanically mixed, tains a considerable quantity of arsenic, or poisonous acids, are rapidly supplanting galvanic batteries. The first appaand are not the salts of a poisonous acid combined with the like picric or oxalic acids, or if the dye is fixed on to the ratus densed by the inventor gave a deposit of 123 grains of goods by means of a poisonous mordant, like the arsenite of silver per hour and per kilogrammeter (7.04 foot-pounds). base rosaniline. First of all must be mentioned the experiments of Prof. Sonnenkalb, in Leipsig, made upon animals soda, or of alumina, the skin, and even the whole body, At present Mr. Wohlwill of Hamburg reports that he has with aniline red and aniline blue, and which prove that pure | may be poisoned. aniline dyes never are of themselves poisonous. Seidler has now repeated the experiments upon the action of aniline red some mistrust, and in order to be on the safe side, then upon the system, and indeed upon himself, for he did not harmlessness must be proven by a chemical analysis. then know that experiments had been made with aniline red | If a chemist wishes to test an aniline dye, or fabrics dyed to obtain a deposit above 3,080 grams per same units.

or printed with aniline colors, in regard to their effect on the health, he should not be satisfied with testing for arsenic or other metallic poison, but must also test whether the dye in question is not combined with a poisonous acid, like oxalic or picric.

Novelties Before the French Physical Society.

At a recent session of the French Physical Society, papers, of which the following are abstracts, were presented:

RESISTANCE OF THERMO-ELECTRIC BATTERY.

M. Rolland has studied by Thomson's method the resistance of the clamond thermo-electric elements. His obser-4. The answer to the query whether food colored with a vations are represented by a curve having for abscisa the pure aniline dye is poisonous is answered by the above. If time and for ordinates the resistance of the element. During the first twenty minutes the curve rises, describing several ade colored with it cannot exert any injurious effect upon sinuosities and then becomes parallel to the axes of abscisa. the body. We have only to consider how extremely dilute When the heating ceases the curve rises at first very rapidly these dyes are when used for coloring. Aniline dyes are and then descends oscillating. M. Rolland remarks that the never used to color drinks in such concentration that their method employed supposes the electro-motive force to be conconsumption would approach any such quantity as that stant, and that consequently the curve may be the result of

the variation of the resistance and of that of the electro-The divisibility of this dyestuff is very extraordinary, a motive force. The progress of the temperature similarly obsolution of 1 part aniline red in 1,000 parts alcohol, is very served on a copper-iron pile is represented by an analogous curve.

A NEW SYSTEM OF ELECTRIC TELEGRAPHY.

M. Thomasi presented a new system of electric telegraphy applicable to submarine cables of great length, which is essentially as follows: There is a new relay, the sensitiveness of which is such that 5 per cent only of the current of a single Minotto element, after having traversed a resistance equal to that of 2,520 miles of transatlantic cable, and a plate of wood lightly moistened (which represents a much greater resistance), suffices to cause it to act on the printing receiving instruments with the greatest rapidity. A second relay termed interrupter, automatically interrupts the current of the local battery after each emission, hindering a spark from being produced in the first relay. This spark, which may occasion inconvenience in a very delicate apparatus, such as the first relay, produces none in the second, because of the energy of the contact, which renders the consequences of the spark absolutely inoffensive. This relay acts in turn on the printing apparatus and on another local battery. The receiving instrument (Morse system, modified) is composed of two electro-magnets, which operate converging metallic points. One point impresses a red and the other a blue trace on the same band of paper, according as the operator transmits the Minotto current in positive or negative direction. Different combinations of these red and blue marks indicate numbers, letters, words, and even entire phrases. The transmitting apparatus automatically reverses the current after each emission, and the emissions are exactly of the same duration.

NEW STELLAR SPECTROSCOPE.

M. Mouton presented a spectroscopic telescope designed for stellar observation. The instrument is quite small, and may be adapted to telescopes of any kind. It consists essentially of a small telescope containing one or more direct vision prisms between the eyepiece and objective. Near the objective and outside is the slit. Finally, outside the slit is another cylindrical telescope which produces on the slit a in none of the workmen in the large aniline factories, nor linear image of the star. The collimator is suppressed and the laborers that use aniline colors for dyeing or printing, the objective of the spectroscope projects upon the eyepiece simply the image of the slit. The loss of light is said to be

New Investigations on Electro Deposition.

At a recent session of the French Academy of Sciences, possess the power, without the aid of mordants, of M. Jamin presented, in behalf of M. Gramme, a note conattaching themselves to the fibers, and cannot be dusted taining many new facts relative to the weight of galvanic deposits which may be obtained per unit of mechanical work by using the magneto-electric machines of which M. Gramme is the inventor. Four series of experiments are summarized. In the first the baths, in variable number, were coupled as cated cases where experience could justify the supposition for quantity. The results showed that the deposit per footthat wearers of clothing of wool, silk, or cotton, dyed with pound of energy expended does not vary with the augmenaniline dyes, although their use is very extensive, have really tation of the surfaces of the anodes. In the second series the baths were connected as for tension. Their number Even if dyes containing arsenic and aniline are employed varied from one to forty-eight, but all had electrodes of experiments demonstrated that the expenditure of work in If the fabrics dyed with these dyes afford no cause for eletrolysis may be considered as null when soluble anodes a Gramme machine that deposits 94 6 pounds of silver with Printed goods and carpets must always be regarded with 15 horse power, which corresponds to 616 grams of silver per hour and per kilogrammeter. M. Gramme considers that by the aid of his recent investigations he will be able

On Some Properties of Glass.

or the support for the film in the negative, or, indeed, in any of the many shapes in which it is applied to photographic use-is looked upon as a substance of such complete permanency and unalterability that it is possible we may be thought guilty of exaggeration when we say that to find a glass which has a just claim to this popular opinion is very far from being an easy matter. That form in which the unblemished character of glass appeals most to the photographer is, alkaline solution in which litmus had been dissolved and acid naturally, the negative plate, of which some hundreds of afterwards added to produce a faint reddening. The rethousands must be used annually; and so much does the sult would be that sufficient alkali would be dissolved out of common idea rule manipulative practice that it is scarcely the glass to restore the blue color to the litmus. This same too much to say that it is more than likely that the poor. much abused bath is credited with many avagary when it is | red cabbage to distilled water, and boiling in such a vessel, perfectly innocent, and some chemical alteration of the glass is the source of the evil.

That glass is so liable to be altered a little reflection upon the difficulties found in plate cleaning will show; for when a case arises where stains, etc., unmistakably point to the glass as the cause, it is evident its surface has not been mechanically abraded or scratched, and the change, whatever it is, must be of a chemical origin, though, possibly, mechanical in its immediate effect upon the deposition of the silver forming the image. We purpose to give some idea of the character of the metamorphosis likely to be undergone by glass when exposed to the action of air or water. Forewarned is to be forearmed, and the deeper we are able to dip into the source of failures the more power do we obtain to prevent them.

Glass forms an interesting example of the fact that, whenever special excellence in a particular direction is to be at tained, it must usually be at the expense of some quality or other- The various characteristics of glass-its hardness, lustre, permanency, insolubility, impressibility, etc.-prove this. It is in the main a silicate of soda or potash, or both, having combined with it other silicates, such as those of lime, alumina, baryta, etc. There is a glass made (silicate of soda) which is quite soluble in water-it has a beautiful sea green hue as generally found in commerce-and between it and the most insoluble varieties, containing silica and aluminium in large proportion, there are all varieties of solubility to be found. Silicates of lime or potash separately are acted upon by water and acids, but, fused together, they are insoluble. The greater the proportion of silica and alumina glass contains the more insoluble it becomes, and it is the manufacturer's province so to proportion the ingredients of his glass as to produce qualities most suitable for the object in view. In this country glass manufactured in Germany, France, and at home is to be purchased, and each has its peculiar characteristics. An extremely pale glass, almost colorless, was imported a number of years ago from Germany; but it gave way to the action of the atmosphere to a most remarkable extent, and we have for some years seen nothing of it.

It has frequently been stated that glass with an artificial surface-that is, one produced by polishing with a brasive powder -is less clean to work and more liable to stain than one with the natural surface first obtained after the sheet has cooled down. Though we believe it quite possible that more has been made of this difference of surface than the actual facts warrant, we can yet easily see why, apart from the supposed hardness of the hypothetical skin, artificially polished glass should be more readily acted upon by water or other chemicals. This surface being entirely given by a process of rubbing, or, as it were, minute scratching with a powder, it might be supposed that if it could be examined by a microscope it would be found rough like "obscured" glass, and thus offer a greater amount of surface to be acted upon.

The action of water upon glass is to decompose it, the potash and soda and a little silica being dissolved, and the greater the amount of alkali present the quicker is the decomposition brought about. The action of the atmosphere is of a similar nature, the moisture always present to a greater or less degree being the real active agent; the common result is to separate the soda and potash, and to leave mon result is to separate the soda and potash, and to leave the silica upon the surface sometimes in a manner that is only perceptible upon heating, when excessively minute flakes separate and leave a dull surface. It has been stated that glass buried deep in the earth has been, when dug up, so soft as to be cut with a knife. The use of soda for cleaning old glass plates is often re-commended, and in its way, and with proper precautions, it very useful; but it is to be remembered that it dissolves the very useful; but it is to be remembered that it di

maining that was fit for use; and there cannot be a doubt Glass-whether in the form of the lens in the camera that there must be large quantities of glass similarly injured, though, unfortunately, not visibly so, the mischief only being observed after taking the negative.

Again: if further proof were required of the solubility of glass-that is, its decomposition, which must result in disintegration and thus roughen the surface, if even microscopically, and render it liable to retain foreign matter-it would be found by boiling in a Bohemian glass vessel a weak experiment can be proved in a homely way by adding a little when the distinct blue of the alkali would be given to the water.

We think we have advanced sufficient facts to show that glass is by no means the unalterable substance so commonly supposed. If it induce a little more care in the use of this necessary photographic adjunct our purpose will be served. -British Journal of Photography.

Stove Blacking.

We hope the following receipt for imparting to stoves a fine black polish, which will neither burn off nor give out an offensive smell, will prove acceptable to some of our readers: Lamp-black is mixed with water-glass (a solution of silicate of soda) to the consistency of syrup and applied with a brush as a thin and even coating, then left twenty-four hours to dry. Afterwards graphite, or black lead mixed with gum. water, is applied, and a polish obtained by rubbing in the usual manner.

 ${\bf A}$ cement for meerschaum can be made of quicklime mixed to a thick cream with the white of an egg. This cement will also unite glass or china.

Inventions Patented in England by Americans. June 15 to June 21, 1877, inclusive.

BOOT SEWING MACHINE .- G. V. Sheffield et al., Brooklyn, N. Y. CHECK REGISTER .- L. Von Hoven. New York city. CUTTING SHEET METAL.-G. A. Perkins, Philadelphia, Pa INDICATOR FOR CAB FARES.-L. Von Hoven et al., New York city. IRONING MACHINE.-T.S. Niles et al., Troy, N.Y. METAL TUBES.-J. E. Folk, Brooklyn, N.Y. NEEDLES.-S. Peberdy et al., Philadelphia, Pa RIVETING MACHINES.-J. F. Allen, New York city. SCAFFOLD FRAME, ETC.-W. Murray, Vicksburg, M ss. STEAM AND AIR ENGINE.-W. Mont Storm. New York city. TORPEDO PROTECTION.-J. T. Parlour, Brooklyn, N. Y. To**Y**.-C. W. Frost, Philadelphia, Pa.

DECISIONS OF THE COURTS.

Supreme Court of the United States,

OIL PATENT.-JOSHUA MERRILL, APPELLANT, V8. DAVID M. YEOMANS AND DANIEL J. GOSS, AS D. M. YEOMANS & GOSS.

[Appeal from the Circuit Court of the United States for the District of Massachusetts.—Decided October Term, 1876.]

A patent for a process is not infringed by the sale of an article similar to that produced. The claims in a patent are to be considered as distinct from the descrip-tion contained in the specification, and as representing what part of the matter described the patentee claims as his invention, and for which he asks protection

tion contained in the specification, and as representing what part of the matter described the patentee claims as his invention, and for which he asks protection. Inventions or discoveries are usually improvements upon some existing article, process, or machine, and are only usefulin connection with it. It is necessary, therefore, for an applicant to describe that upon which he engrafts his invention, as well as the invention itself. When the invention is of a new combination of old devices, it is necessary to describe with particularity all the old devices, and then the new mode of combining them. While it is essential that the specification should describe such matters, both oldand new, as are necessary to an understanding of the invention, the claim must contain a distinct and specific statement of what the applicant claims to be new and of his invention. One who proposes to secure a monopoly of certain inventions at the expense of the public should set forth with clearness and precision the thing which no one but himself can use or enjoy without paying him for the privilege of doing so. In a claim to "the above described new manufacture of the deedorized heavy hydrocarbon oils suitable for lubricating them substantially as is hereinbefore described," the word "manufacture" may be used to express the process or the product thereof, but when taken in connection with the words "by treating them substantially as is hereinbefore described. The inventor of an article is entitled to protection therefore, however produced, and there is no reason why an applicant, for a patent, if the had in his mind a claim for the article produced, should limit his claim by a description of the process. The courts are inclined to give a patentee the benefit of a liberal con-

clsion both the instrumentality and the process by which he makes the oil in question. And in regard to a part of the apparatus which he uses he makes a distinct claim for its invention, and that is not in dispute here.

makes a distinct claim for its invention, and that is not in dispute here. He also describes with fullness and accuracy the process of distillation by which he produces this oil. He gives the temper ture to be used, the mode of heating, the degree of rapidity or delay to be used in dist lying the introduction, and the advantage of that introduction, of superheated steam into contact with the oils to be distilled during the process. He also describes, though in short terms, the article produced, the main feature of which he declares to be its freedom from the offensive odor which, before his invention, seemed to be an inseparable quality of those oils; and he mentions some of the more important uses to which this de-odorized oil is applicable in the arts. It is fairly to be inferred from this statement that if all which is described

which, before his invention, seemed to be an interparate quarty of those odils; and he mentions some of the more important uses to which this de-odorized oil is applicable in the arts.
It is fairly to be inferred from this statement that if all which is descrited as new in these specifications is really so, the inventor has a right to a patent for three inventions:
For a modification or improvement in the distilling apparatus.
For a modification or improvement in the distilling apparatus.
For a modification or improvement in the distilling apparatus.
For a modification or improvement in the distilling apparatus.
For a modification or improvement in the distilling neary hydrocarbon oils, by which they are deprived of their offe sive odors.
For the product of this new process of distillation, namely, the deodorized heavy hydrocarbon oils fitted for use in the arts.
When a man supposes he has made an invention, or discovery useful in the arts, and therefore the proper subject of a patent, it is nine times out of ten an improvement on some existing article, process, or machine, and is only useful in connection with it. It is necessary, therefore, for him in his application to the Patent Office to describe that upon which he engrafts his invention, as well as the invention itself, and in cases where the invention for a patent the descriptive part is necessarily argely occupied with what is not new, in order to an understanding of what is new.
The act of Congress, therefore, very wisely requires of the applicant a distinct and specific statement of what he claims to be new and to be his invention. In practice, this allegation of the distinct matters for which he claims a patent comes at the close of the schedule or specification, and is often accompanied by a disclaimer of any title to certain matters before described, in order to prevent conflicts with pre-existing patents.

the effort to ascertain precisely what it is that is patented to the appellant in this case.

In this case. In this case, In this part of his application he makes two separate claims, the second of which relates to a modification of the distilling apparatus, and is not in dispute here. Turning our attention to the first claim, we are compelled to say that the language is far from possessing that precision and clearness of statement with which one who proposes to secure a monopoly at the ex-pense of the public ought to describe the thing which no one but himself can use or enjoy without paying him for the privilege of doing so. It is as follows:

as follows: I claim the above described new manufacture of the deodorized heavy ydrocurbon oils suitable for subricating and other purposes, free from the characteristic odors of hydrocarbon oils, and having a slipht smell like fatty oil, from hydrocarbon oils, by treating them substantially as is here-inbefore described.

The word manufacture in this sentence is one which is used with equal propriety to express the process of making an article, or the article so made. "Themanufacture of hydrocarbon of's," means primarily the mak-ing of hydrocarbon oils. It may mean the thing made also. Are there ather words in the sentence calculated to throw light on the meaning of this one?

I claim the above described new manufacture of hydrocarbon oils * •

by treating them substantially as hereinbefore described. It seems to us that the most natural meaning of these words is that— I claim this new mode of manufacturing hydrocarbon oils by treating them as hereinbefore described.

them as hereinbefore described. This is the meaning which would first suggest itself to the mind. If the product is meant, the "by treating them substantially as hereinbefore de-scribed" are useless. They are not only useless, but embarrassing, for by the well settled rules of construing all instruments some importance must be attached to them; and if they are to be regarded at all they must either refer to the process of making the oils for which the applicant is claiming a patent, or they are intended to limit his claim for a patent for the pro-duct to that product only, when produced by treating the oils in the man-ner before described. The counsel for amellant disclaim this batter count if

The counsel for appellant disclaim this latter construction, and allege

The counsel for appealant discialing this latter construction, and allege that the pattern covers the oil described, by whatever mode it may be produced. It is necessary to insist on this view, because it is made to appear in the case that the oils sold by defendants were produced by a process very different from that described by appellant. We can see no reason why the applicant for the patent, if he had in his mind a claim for the article produced, should have intended so to limit his claim. If the *article* was the discovery which he sought the exclusive right to make, use, and sell, he was entitled to that monopoly, however produced.

duced. If, however, he had in his own mind only a claim for the process of man-

If, however, he had in his own mind only a claim for the process of man-ufacture by which the article was made, then his reference to the mode of treating the oils from which it came was evidently proper and intelligible. But the language in the specifications aids us in construing the claim. In the sentence next preceding this claim he says: It will also be evident to those skilled in the art that my invention will be used, if the above mentioned process be worked, to produce the deodorized heavy oils above described from distilled hydrocarbon oils, etc. It is very clear that what he here calls his invention oils, etc. It is very clear that what he here calls his invention on sist in produce the deodorized oils, and not the oil itself. So, again, he says: From the above it will be obvious that my invention consists in produce-ing heavy hydrocarbon oils suitable for lubricating and other purposes, and free from the characteristic odor, by distilling from them the volatile matter from which objectionable of deodorizing heavy oils with this apparatus. I place the oil to be deodorizing heavy oils with this apparatus, I place the oil to be deodorized in the still and heat they the

apparates, I have the only the demonstrate in the still and these if your fire beneath to the required temperature to commence the operation, the steam being shut off from the coil, and the outlet cock being opened to admit of the expulsion of any water from within the coil. Here the word "manufacture" is used in the sense of the word "pro-cess," a word which could be substituted for it without a shade of change in the summer the summer water are more protein only and the sense we have a state of the substituted for it without a shade of change in the summer the sense we have a sense of the sense we have a sense we have a sense of the sense we have a sense we have a sense of the sense of th

in the meaning. As it can here mean nothing else but process, we have a definition of the meaning to be attached to it in other parts of the same paper, if that meaning were otherwise doubtful. But apart from these verbal criticisms, all of which are just, and tend

But apart from these verbal criticisms, all of which are just, and tend strongly to show what was the invention claimed by appellant, it is increa-sible to read the four printed pages of specifications in which appellant minutely describes his invention without observing that they are almost wholly directed to the apparatus, the mode of using it, and the peculiar process of distillation, by which the more volatile parts of the heavy oils, which contain the offensive odors, are separated from the main body of the oil, pass over in that process, and leave the remainder free from this great drawback in its use in the arts. Why should this be so if the appli-cant for the patent was only looking to the products as his invention the deodorized heavy hydrocarbon oils? If the oil alone was to be patented, by whatever process made, this elaborate description of one particular process was unnecessary.

by whatever process made, this elaborate description of one particular process was unnecessary. A strong appeal is made by counsel to give the appellant the benefit of a liberal construction in support of the patent. Cases are cited in which this court has held that rither than defeat a patent where it appears that a valuable invention has really been made, this court, giving full effect to all that is found in the application on which the Patent Office acted, will uphold that which was really invented, and which comes within any fair interpretation of the patent sesserion or claim. We are not disposed to depart from this rule in the present case. There is no question here but that the patent is good for the second claim, for the superheating coil, with its steam pipe, etc. And we are all of opinion that it is good for the process of distillation described in the specifications, by which the heavy hydrocarbon olls are decodrized. It is, therefore, a valid patent for two important matters well set forth and described. If the patenter is also entitled to a patent for the product of this distillation, and that failed, as we think he has, to obtain it, the law affords him a remedy by a surrender and reissue. When this is done the world will have fair notice of whathe claims—of what his patent covers, and must govern them-set encordingly. The growth of the patent system in the last quarter of a centery in this ountry has reached a stage in its progress where the variety and many tude of the interests involved require accuracy, precision, and care in the preparation of all the papers on which the patent is founded. It is no longer a scarcely recognized principle struggling for a foothold, but it is an organized system with well scilled rules, supporting itself at once by its utility, and by the wealth which it creates and commands. The developed Initial a scalar of the second second

silica of the glass, acting with greater or less effect according to its strength and temperature. If this be borne in mind many troubles will be avoided, numerous cases of ineradicable stains having been traced to overlong soaking in alkaline solutions. If proof were needed of the solvent and injurious powers of small quantities of water, if continued for a sufficient length of time, it will be only necessary to breathe upon one half of a piece of patent plate glass, and, after immediately covering the film of condensed moisture by another plate to wrap up the two, place in a cold place for a twelvemonth, and then examine. The moistened part will be roughened to such an extent as almost to take the mark of a blacklead pencil. We have seen packets of several gross of plates entirely ruined from this cause; glass plates brought up of a cold store room into a damp atmosphere had condensed the moisture of the air upon their surfaces, and the packer had packed them without wiping them, as, indeed, it was scarcely likely he would think of doing. They remained immersed for a considerable time, and when opened were found to have the surface visibly eaten into, not a glass re-

The interests of the public demand that the claims in a patent should clearly and distinctly define and limit the actual inventior. claimed by and secured to the patentee.

Mr. Justice MILLER delivered the opinion of the court:

Mr. Justice MILLER delivered the opinion of the court: The appellant in this case, who was complainant in the Circuit Court, ob-tained a patent, in May, 1869, for a new and useful invention, which re-lates to the heavy hydrocarbon oils, and he sued the appelles, who were defendants in that court, for an infringement of his patent. The defendants were dealers in oils and not manufacturers of them. If the appellant's patent was for a new oil, the product of a mode of treating the olls of that character which he describes in his application, the defend-ants may be liable, for they bought and sold, without license or other an-thority fromhim, an oil which is proved to be almost if not quite identical with the one which he produced. If, however, appellant's patent is only for the mode of treating these oils invented and described by him— n other words, for his new process of making this new articile of hydrocar-bon oil—then it is clear the defendants have not infringed the patent, be-cause they never used that process, to any other, for they manufactured none of the oils which they bought and sold. The counsel for appellant here maintain that his patent is for the new article, and is not for the process hy which the new oil is made. The issue thus presented must be decided solely upon a correct construc-tion of the plaintiff's patent, and the accompanying specifications, in which, as required by the act of Congress, he makes the statement of his invention.

invention

Invention. No such question could have arisen if appellant had used language which clearly and distinctly points out what it is that he claims in his inwention. We us

vention. We use the word claim as distinct from description. It must be con-ceded that the appellant's specification describes with minuteness and pre-

Mr. Justice Clifford dissenting. I dissent from the opinion and judgment in this case upon the ground that the invention, when the claim is properly construed, is an invention of the described new manufacture, and not merely for the process as de-cided by a majority of the court.