

Sulphate of Copper as a Preservative of Wood.

König has investigated the chemical reactions which occur when wood is impregnated with a preservative solution of blue vitriol. He finds as a general rule, that a certain quantity of basic sulphate of copper remains combined in the pores of the wood in such a manner that it cannot be washed out with water. The copper salt may be seen by its green color in the spaces between the yearly rings in the less compact portions of the wood, that is to say, in those portions which contain the sap. Those varieties of wood which contain the most resin retain the largest amount of the copper salt,—oak, for example, retaining but little of it. The ligneous fiber itself appears to have little or nothing to do with the fluxation of the copper salt, and indeed none whatever is retained in chemical combination, so that it cannot be washed out with water, by pure cellulose. When wood, from which all resin has been extracted by boiling alcohol, is impregnated with sulphate of copper, it does not become colored like the original resinous wood, and the copper salt contained in it may readily be washed out with water. In like manner, from impregnated resinous wood all the copper salt may be removed, with the resin, by means of alcohol.

The constituents of the blue vitriol are consequently fixed in the wood by means of the resin which this contains.

Further it is found that the impregnated wood contains less nitrogen than that which is unimpregnated and that it is even possible to remove all the nitrogenous components of the wood by long-continued treatment with the solution of sulphate of copper. The nitrogenous matters being soluble in an excess of this solution just as the precipitate which forms when aqueous solutions of albumen and sulphate of copper are mixed is soluble in excess of the latter. Since the nitrogenous matters are well known to be promoters of putrefaction, their removal readily accounts for the increased durability of the impregnated wood.

The utility of blue vitriol as a preservative may also depend in a measure upon the resinous copper salt which is formed, by which the pores of the wood are more or less filled up and the ligneous fiber covered so that contact with the air is prevented and the attacks of insects hindered. It is suggested that those cases in which the anticipated benefits have not been realized in practice by impregnating wood with a solution of blue vitriol, may probably be referred to the use of an insufficient amount of this agent, *i. e.*, where the wood was not immersed in the solution for a sufficient length of time. The action should be one of lixivation, not merely of absorption.

A New Anæsthetic.

During the past few months, says the *American Journal of Science and Arts*, considerable interest has been excited among members of the medical profession by an attempt to introduce into practice a volatile liquid possessing anæsthetic properties, which is obtained as an incidental product in the manufacture of coal oil. Of the chemical history of this substance, called keroselene by its manufacturers, but little is as yet known. Professor Bacon, of the Harvard Medical School, informs us "that a sample in his possession is of sp. gr. 0.640, at 72° Fah. When heated in a flask containing scraps of platinum foil it began to boil at about 85° Fah. As the more volatile parts distilled off, the temperature continued to rise, and at 170° about three-quarters of the liquid had evaporated. It continued to boil feebly, but the whole was not converted into vapor until the thermometer had risen considerably above 300°; and when the flask was allowed to cool, much of the vapor condensed before the temperature had fallen to 300°. It is evident that several, perhaps many, hydrocarbons are present, having a wide range of boiling points. Probably, the most volatile of them would be gaseous at ordinary temperatures, if isolated. It is remarkable that the keroselene should be so readily and completely volatile at atmospheric temperatures. I found that keroselene and Squibb's ether, exposed in watch glasses, lost equal weights in 2½ and 3½ minutes respectively; and the former evaporated completely in about two-thirds of the time required for the ether. The specimen which I examined contained a little sulphur. Some sulphur compound was therefore present as an impurity, which would be decidedly objectionable for anæsthetic purposes."

The vapor of this substance possesses very decided anæsthetic properties. This was first accidentally noticed by its effects upon a laborer engaged in cleaning a cistern at a coal-oil manufactory, and afterward proved by the workmen by experiments upon flies and mice. Whether it can be employed without danger as a substitute for ether or chloroform is as yet undecided. Dr. H. J. Bigelow, in the *Boston Medical and Surgical Journal*, reports several cases in which its exhibition was attended with unfavorable symptoms; and at the present time the general feeling of medical men in Boston with regard to its value is evidently much less favorable than when it was first brought forward. It may be remarked that the "keroselene" in question is exceedingly well purified as far as relates to its odor, being almost entirely free from the objectionable smell which characterizes most of the light coal oils.

UNITED STATES CIRCUIT COURT—IN EQUITY**Infringement of Patent—Bank Note Companies in Court.**

Tappan, Carpenter & Company agt. *The National Bank Note Company* and others—SHIPMAN, D. J.—This is a motion for a preliminary injunction to restrain the respondents from using a machine, or machines, for perforating paper, alleged to be the invention of George C. Howard, and for which he holds a patent. The complainants allege that after the issuing of the patent to Howard (May 21, 1861), he assigned to them the exclusive right to use the invention for one year. It is not stated in the bill where the year began to run, nor is the date of the assignment given. But I assume the year commenced on the day of the date of the patent.

From the allegations of this bill, and the affidavits filed in the cause, I must, in deciding this motion, assume the following facts:—

1. That the machine patented was invented by Howard, more than four years before he applied for a patent.

2. That for a valuable consideration to the patentee, and for the profit of the complainants, the former permitted the latter to use one or more of the machines for more than two years before any application was made for a patent.

3. That at the instance of the complainants the patentee permitted the American Bank Note Company to construct one or more of these machines, and use them in their business; precisely how long, or upon what consideration, does not appear.

4. That only one month and ten days, or, at the longest, about two months elapsed, during which exclusive possession of the invention secured by the patent could have been enjoyed either by the patentee or the complainants.

Without touching upon the question of abandonment, if I were called to decide upon this motion, upon the ground that the patentee had forfeited his right to a patent, under the seventh section of the act of 1837, I should, as the case now stands, be compelled to deny the relief. I could not resist the conclusion that the use of the machines by the complainants, with the consent of the patentee, for a period of more than two years before the application for a patent, in the absence of any evidence that a single step was taken to secure one, or that either the inventor or the complainants ever intended to secure one, that the patentee had forfeited his right. It would be difficult, on the present evidence, to hold that the use was not a public one. And if it was a public use, then the patentee, by permitting such use for more than two years before he made any application for a patent, forfeited all right to one, and his patent is void. This I understand to be the doctrine laid down in *McCormick agt. Seymour* (2 Blatch. 254). In that case, Mr. Justice Allison remarked, in construing the seventh section of the act of 1837, that if a patentee "either sells a machine, or uses one, or puts one into public use two years before his application for a patent, it works a forfeiture of his right."

But I do not wish to prejudice this point of forfeiture in the present case, nor the other of abandonment. Courts should be very tender of the rights of inventors, and not draw hasty conclusions adverse to the validity of their rights secured by patent. I am, therefore, disposed to decide this motion on another ground, and one which will throw no doubt on the validity of this patent, although it is difficult to see how it can be saved on the conceded facts. I will therefore assume, for the purposes of this decision, that there was no public use of this invention prior to the application for a patent—no forfeiture of the patentee's rights by a use of more than two years, and no abandonment and dedication to the public. I will assume that whatever use there was was secret, and under such circumstances that the right to a patent was not lost.

But after these assumptions, it is equally clear that I can grant no preliminary injunction. This extraordinary relief is never granted as matter of course. It is never granted on filing a bill and producing a patent. The patent itself, although in a certain sense is *prima facie* evidence of the validity of the grant, is never sufficiently strong *per se* to warrant the relief asked for in this motion. The title of the patentee must, in order to obtain this relief, always be strengthened by exclusive possession for some period of time, or by an adjudication in which the validity of the patent has been sustained. This patent never having been litigated, of course no judgment has ever been pronounced in its favor.

The right could not have been in the exclusive enjoyment of any one for more than one month and ten days, or at farthest about two months, as the application was made on the 23d of April and the patent was granted on the 21st of May, 1861, and before the 1st of July the respondents asserted their right to use the machine, and insisted that the patent was void. The principle that exclusive possession for a time strengthens the title of a patentee, is founded on the idea that, as it is a claim of right adverse to the public, and the public acquiesce in that claim, such acquiescence raises a presumption that the claim is good. But no such presumption can be raised

in this case. There is no evidence that the public, or that small portion of them which would be likely to avail themselves of this invention, knew even of its existence, much less of the existence of an exclusive grant to this patentee or to any one else.

Nor in this view of the case can I take into account the possession of the right, and the use of the invention, before the application or the grant of the patent. This is sometimes done on the principle laid down in *Sargeant agt. Seagreave*, 2 Curtis C. C. R., 555. But, of course, the use in such a case must be a public use, under an avowed claim of a right to a patent; otherwise there is no exclusive possession as against the public, and no claim in which the public can acquiesce. In this case, I must assume the use prior to the application to have been secret, or the patent is clearly void. This unavoidably places the complainant, so far as this motion is concerned, between Scylla and Charybdis. To hold that the use prior to the application was a public use, and was exclusive as against the public, would, as it extended beyond two years, wreck the patent. To hold that it was a secret use, away from the eye of the public, sweeps away the ground of exclusive possession, and acquiescence of the public, and leaves no foundation upon which the motion can stand. But the latter result is least prejudicial to the patent. The motion is, therefore, denied. As these questions of forfeiture and abandonment are peculiarly within the province of the jury, I think unless the answer, when filed, should change the aspect of the case, that they should be passed upon by a jury before an injunction is asked for.

Improvement in Hanging Propeller Screws.

A good improvement has recently been patented in England by A. Chricton, of Cork, Ireland, for arranging and fitting the shafts of propellers. He connects the last or outer length of shaft with a joint or coupling in the manner of a hinge, so that when the knuckles or faces of the joints stand vertically, the shaft having the screw upon it may be raised from the horizontal to a vertical position. The stuffing box upon the screw shaft is in advance of, or forward of, the joint or coupling, as is also the thrust block. Suitable bearings are provided for the movable length of screw-shaft to rest in when at work, and top brasses or bearings are provided capable of being moved or withdrawn horizontally or vertically when the screw and its shaft have to be raised or withdrawn. The last piece of propeller shaft need only be of a length sufficient to enable the point of the lower blade of the screw to come within the line of the inner stern post, when the shaft is vertical and the screw horizontal; but the screw shaft may be turned up to an extent less or more than 90° from its original plane of rotation, for the purpose of accommodating any feature in the internal arrangement of the stern of the ship. For the purpose of enabling the screw-shaft to be raised, also for the purpose of allowing the screw propeller to be raised and moved inward by describing a quadrant or any lesser or greater portion of a circle, Mr. Chricton divides the inner stern post, from the boss upward, into two parts or thicknesses, leaving the requisite space between them; and he forms a box or hollow space immediately above the narrower part of such opening, for the purpose of receiving the screw. Where it is desirable to provide for the removal or renewal of the propeller, or its adjustment, examination, or repair, it is only necessary to continue this water-tight or boxed space up to any convenient height above the deep load water line, to enable ready access to be afforded to the screw and its shaft. Power is applied to the screw shaft for the purpose of raising it or moving it in the manner described, either by means of a rack and pinion gearing, or ordinary block and fall tackle, or any other well known mechanical means may be employed for giving the requisite amount of motion, and for securing the propeller when raised.

The locomotive *Reindeer*, on the Naugatuck Railroad, having a set of Krupps's cast-steel tires, had run 7,740 miles up to the first of August last without any perceptible wear, while their adhesion upon the rails was equal to that of wrought iron tires. The time is not far distant, we believe, when the tires of all driving wheels will be made of steel; also the faces of the rails on the track. This will secure far greater durability in rails and engine wheels.

BENZOLE AS A SUBSTITUTE FOR TURPENTINE.—As turpentine has become scarce and high in price, owing to the supplies from North Carolina being cut off, the naphthaline oil obtained in the distillation of the petroleum of the oil wells in Pennsylvania, has been tried as a substitute in painting and found to answer well. It is now used in place of turpentine in the car works at Pitsburgh, Penn. This is a new application in the arts, and a wider field has been opened for the sale of coal-oil products.