

at the basin ; although it widens above in a conical form, for the sake of holding more coke, it is not, however, mounted upon wheels.

In point of contrast with these small cupola-furnaces, the last mentioned engineer informs us, that he has lately heard from Glasgow, of *cupola furnaces twelve feet high* being introduced there, and which will contain at once, three separate charges of fuel and cast-iron ; namely, one charge of iron melted, and ready to run out ; another, in a great state of forwardness above it ; and the third only beginning to be heated. And that, as these charges are continually renewed, not only a very great saving of time and fuel is thereby occasioned, but the quality of the iron is also greatly improved. There are two pairs of bellows employed to heat these furnaces ; but, instead of delivering the blast into one aperture only, as usual, they are placed so as to deliver it into two, made at right angles to each other, in the octangular bases of the furnaces, so that the blast alternately crosses the insides of the furnaces in opposite directions.

It is not a little singular, that both in town and country the iron-founders can find nothing better to line the interior of their cupola-furnaces with, than *road-dust*. Possibly the mixture of *vegetable matters* with the sand, gravel, clay, &c., which form the ordinary materials of roads, becoming *carbonized* by the heat, may tend to hinder the fusion of the lining, as the mixture of *coke*, grossly powdered with Stourbridge clay, does the melting pots employed in cast-iron founding in the small way ; (see vol. ii. p. 159. of this Journal.)

We have been informed, that at another iron-foundry in the country, which casts three tons a day on an average, the proprietors make it a practice to take down the lining of fire-bricks in their cupola-furnaces every week, and for that purpose build them up with *sand* only.

[*Technical Repository.*]

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BY PETER A. BROWNE, Esq.

On the law of Patents for new and useful Inventions.

ON THE PAYMENT OF THE FEES.

On applying for a patent, under the laws of the United States, the first thing required is the payment of the expenses. The eleventh section of the act of Congress of 1793, declares, "that every inventor, before he presents his petition to the Secretary of State, signifying his desire of obtaining a patent, shall pay into the Treasury \$30, for which he shall take duplicate receipts ; one of which receipts he shall deliver to the Secretary of State, when he presents his petition : and the money thus paid shall be in full for the sundry services, to be performed in the office of the Secretary of State, consequent on such petition, and shall pass to the account of clerk hire in that office."

Every one the least conversant with the subject of taking out pa-

tents in foreign countries, will be struck with the smallness of the sum required by the Act of Congress.

It will be observed, that the payment of the \$30 is a prerequisite to the presentation of the petition. Nevertheless, if the officer issues the letters without the money being paid, the patent will not be thereby invalidated.

THE METHOD OF APPLYING FOR A PATENT.

The method of applying for a patent is by a PETITION. In England, the petition is directed to the King. In the United States, it is addressed to the Secretary of State, signifying a desire of obtaining an exclusive property in the invention, or discovery; and praying that a patent may be granted therefor.

In Godson's law of patents, page 47, it is stated that there is no clause in the English Statute by which the subject can *demand* a patent as a matter of *right*; that it is a free gift of the King, emanating from him as the patron of Arts and Sciences, and granted as a *gracious favour*, at the *humble* request of a subject.

In the United States, it is a CONSTITUTIONAL RIGHT, which the citizen may *demand*, and which the officers of government have no power to withhold.

The petition should state in *clear* and *precise* terms, the art, machine, manufacture, or composition of matter, or the improvement, of which the petitioner claims to be the inventor. Many law suits would be avoided if strict attention was paid to this suggestion.

Let the applicant bear in mind, that the petition is the *foundation* of his claim; that the letters patent, which issue in the manner herein-after stated, will describe his invention in his own language, as used in his petition. The Act of Congress says the letters patent shall issue, "reciting the allegations and suggestions of the said petition, and giving a short description of the said invention, or discovery." This short description is copied from the petition. In the case of *Boulton v. Bull*, (so often referred to,) the patent was for "a new invented method of using an old engine in a more beneficial manner than theretofore, by the mechanical employment of certain principles;" and much time was spent, both at the bar, and on the bench, in endeavouring to find out *what* it was that the patentee claimed to have invented. In several other instances which could be mentioned, a want of precision in stating whether the discovery claimed was of the *original machine*, or only an *improvement*, has led to much useless litigation, and, in more than one instance, has endangered the patentees' rights.

THE OATH OR AFFIRMATION.

This petition should be accompanied by an oath, or affirmation, that the applicant doth verily believe, that he is the true inventor or discoverer of the art, machine, or improvement, for which he solicits a patent. This oath is a prerequisite, without which the patent ought not to issue. *But the validity of the patent, if issued, does not at all depend upon this oath.*

In the case of *Whittemore v. Cutter*, 1 Gallison's reports, 429, an action was instituted for a breach of a patent right in a machine for making of cotton and wool cards. One objection taken was, that the oath made by the inventor, did not conform to the Act of Congress. Judge Story observed, "the statute requires that the patentee shall swear 'that he is the true inventor or discoverer of the art, machine, or improvement.' The oath taken by Whittemore was, that he was the true *inventor, or improver*, of the machine." The taking of the oath was but a prerequisite to the granting of the patent, and in no degree essential to its validity. It might as well have been contended, that the patent was void, unless the thirty dollars required by the 11th section of the act, had been previously paid. Nevertheless, it is necessary to be very careful in drawing up this oath; for, the next rule to be laid down relative to the affidavit is, that,

Where the words of the patent or specification are doubtful as to the subject of the grant, the affidavit may be resorted to, in aid of the construction.

This was decided in the case of *Pettibone v. Derringer*, by Judge Washington. The patent was for "a new and useful improvement in musket, pistol and rifle barrels, by an auger called the spiral groove, or twisted screw auger." The specification stated that "the invention consisted in the manner of making the auger, or the particular form or construction of the same, as also the mode of application." The affidavit stated that "he (the applicant) verily believed that he was the first inventor of the improved method of making augers, or bits, for boring musket, pistol, and rifle barrels, as above described." Judge Washington remarked, that whether the want of an affidavit will avoid the patent, or will in all cases confine the patent to the invention stated in it, as the defendant's counsel have contended, are questions which need not be decided in this case; but there can be no doubt that when the construction of the patent and specification as to the subject of the grant is *doubtful*, the affidavit, if more precise, may be resorted to for explanation, and to remove ambiguity. It would seem to be particularly proper to do so, for restraining general expressions in the specification; as the oath required to be taken by the Act of Congress is, that the inventor does verily believe that he is the true inventor of the art, machine, or improvement, for which he solicits a patent.

4. If the applicant be a *resident Alien*, he is required, by the 1st section of the Act of Congress of the 17th of April, 1800, to swear, or affirm, "that such invention, art or discovery, hath not, to the best of his knowledge or belief, been known, or used, either in this, or any foreign country."

OF THE SPECIFICATION OR DESCRIPTION.

The next thing required by the Act of Congress is the *description*, or, as it is generally called, the *specification*; the words are these, "and shall deliver a written description of his invention, and of the manner of using, or process of compounding the same, in such full, clear, and exact terms, as to distinguish the same from all other things

before known, and to enable any person skilled in the art or science, of which it is a branch, or with which it is most nearly connected, to make, compound, and use the same. And in the case of any machine, he shall fully explain the principle, and the several modes, in which he has contemplated the application of that principle, or character, by which it may be distinguished from other inventions."

There is nothing in the statute of James which requires any specification, and for about a century after the passing of the act, none was required; but a clause or proviso is now generally inserted in the British patents; that is, "if the patentee shall not, within a stated time, particularly describe and ascertain the nature of the said invention, and in what manner the same is to be performed, by an instrument of writing under his hand and seal, and cause the same to be enrolled in the Court of Chancery, then they shall become void." See *Harmar v. Playne*, 11 East. rep. 101.

To pursue the order laid down in the Act of Congress, *the applicant must first give a description of his invention*. The public having a right to know, in precise terms, what it is that the applicant claims to have invented.

In *McFarlane v. Price*, 1 Starkie's reports, 199, which was an action for infringing a patent for certain improvements in making umbrellas and parasols, Lord Ellenborough said, "the patentee in his specification, ought to inform the person who consults it, what is *new* and what is *old*. He should say, my improvement consists in *this*, describing it by words, if he can," &c.

And in *Lowell v. Lewis*, 1 Mason's reports, 187, Story, Justice, says, "I accede at once to the doctrine of the authority which has been cited (alluding to the above case) that the patentee is bound to describe, in full and exact terms, *in what his invention consists*."

It would appear also that the specification should agree with the patent; which, as before shown, accords with the petition; and therefore it may be laid down as a rule, that *the specification must agree with the petition*.

Lord Cochrane obtained a patent for "a method, or methods, of more completely lighting cities, towns, and villages." The specification described certain improvements upon street lamps. Mr. Justice Blanc said, "I think this patent cannot be supported: it is in substance, a patent for an improvement in street lamps, and should have been so taken." *Cochrane v. Smethurst*, 1 Starkie's reports, 205. This case is quoted in 1 Mason's reports, 476, and approved by Judge Story.

A patent for an improved machine, must show precisely, in the specification, in what the improvement consists.

In the above mentioned case of *Lowell v. Lewis*, 1 Mason's reports, 188, Judge Story, to what is before quoted, adds, "and if it be for an improvement *only*, upon an existing machine, he should distinguish what is *new*, and what is *old*, in his specification, so that it may *clearly* appear for what the patent is granted."

In making this description no part of the invention must be omitted, the whole must be described. This is laid down in Buller's, N. P. [77.] "If the specification be, in *any part of it*, materially false or defective,

the patent is against law, and cannot be supported;" and again, "if any one part of the invention be not sufficiently described, the patent is void."

In the next place, the Act of Congress requires, that a description be given of the *manner of using, or process of compounding* the invention. In so doing the patentee must be careful not to omit *any thing* that is useful in the operation.

A patent was granted for making steel trusses, and it appeared that the patentee, in tempering the steel, rubbed it with tallow, which was of some use in the operation, and because this was omitted, the specification was held to be insufficient, and the patent was avoided. *Liardet v. Johnson*, cited by Mr. Justice Buller in *Turner v. Winter*, 1 Term Reports, 602.

In like manner, *the patentee must be on his guard not to insert in his specification unnecessary ingredients, which will not answer the purpose.*

Turner obtained a patent for producing a yellow colour for painting, for making white lead, and separating the mineral alkali from common salt; all by one process. One of the ingredients directed to be used was minium, which, it was contended, would not answer the purpose. Buller, J. observed:—"If he (the patentee) could only make it with two or three of the ingredients specified, and he has inserted others which will not answer the purpose, that will avoid the patent."

Again: *He must not conceal a more beneficial mode of working the invention.* It must be borne in mind, that the patentee makes a contract with the public, that in consideration of the protection afforded during the fourteen years, he will teach them the *whole process*; any concealment, therefore, would be a fraud upon the public.

W. Brown took out a patent for a machine, or machines, for the manufacture of bobbin-lace; and it appeared upon the trial of an action brought by Bovill, his assignee, v. Moore, for a breach of this patent right, that the machinery used, was assisted by bending together two of the teeth of the dividers, or making one larger than the rest, which was not described in the specification. Lord Chief Justice Gibbs remarked, "that if W. Brown, since he obtained his patent, had discovered an improvement, effected by bending the teeth, or adding a larger tooth, he might apply that improvement, and his patent would not be affected by his using his own machine in that improved state; but if, at the time when he obtained his patent, he was apprized of this more beneficial mode of working, and did not, by his specification, communicate this *more beneficial mode of working* to the public, that would have been a fraudulent concealment from the public, and would render his patent void. *Bovill v. Moore*, 2 Marshall's Reports, 211.

In the same case, Sir Vicary Gibbs says, "there is another consideration respecting the specification, which is also a material one, and that is, whether the patentee has given a full specification of his invention, not only one that will enable a workman to construct a machine answering to the patent, but one that will enable a workman to construct a machine answerable to the patent, *to the extent most*

beneficial within the knowledge of the patentee at the time: for a patentee who has invented a machine useful to the public, and can construct it in one way more extensive in its benefits than in another, and states in his specification only that mode which would be *least* beneficial, reserving to himself the *more* beneficial mode of practising it, although he will have so far answered the patent, as to describe in his specification a machine to which the patent extends, yet he will not have satisfied the law by communicating to the public the *most* beneficial mode he was then possessed of, for exercising the privilege granted to him."

In like manner, *the patentee must by his specification put the public in possession of the cheapest method of constructing and using the invention and discovery.*

This principle was recognized by Mr. Justice Buller in *Turner v. Winter*, 1 Term reports, 602, he says, "so if he makes the article for which the patent is granted, with *cheaper materials* than those which he has enumerated, although the latter will answer the purpose equally well, the patent is void, because he does not put the public in possession of his invention, or enable them to derive the same benefit which he himself does."

It will be proper here to observe, that in laying down the foregoing rules we have not taken at all into consideration the *motives* of the applicant, but have stated, generally, that if the specification be defective in any of the essential particulars before pointed out, that the letters patent are void. The reason is this; the monopoly is granted upon an *express condition* that the patentee shall make such a full disclosure of his secret as will enable the public, after the expiration of the term of exclusive privilege, by a bare inspection of the specification, to make and use the invention or discovery, in as full and ample a manner as the patentee made and used it. Now if such a disclosure be not made, the *condition is broken*, the consideration fails, and the *motives* of the patentee are immaterial. This is in perfect accordance with the principles of the common law, and the decisions of the British courts upon the English statute.

In the United States, no defect, or concealment, in a specification, will avoid a patent, unless it arise from an intention to deceive the public.

This important distinction between the American and English law, depends upon the peculiar terms of the act of Congress; the words of the third section, above quoted, being restrained by those of the sixth section, which are as follow: "that the defendant in any such action (an action brought for infringement) shall be permitted to plead the general issue, and give, in evidence, this act, and any special matter, of which notice in writing may have been given to the plaintiff; tending to prove that the specification does not contain the whole truth relative to his discovery, or that it contains more than is necessary to produce the described effect, which concealment and addition shall fully appear to have been made *for the purpose of deceiving the public*; or that the thing, thus secured by patent, was not originally discovered by the patentee, but had been in use, or had been described in some public work, anterior to the supposed discovery of the patentee; or

that he had surreptitiously obtained a patent for the discovery of another person: in either of which cases, judgment shall be rendered for the defendant, with costs, and the patent shall be declared void."

In 1813, this point came before the Circuit Court of the United States for the 1st circuit, *Whittemore v. Cutter*, 1 Gallison's Reports, 429. The plaintiff sued for a violation of his patent right for a machine for the making of cotton and wool cards, and after a verdict for the defendant, upon a motion for a new trial, this was one of the grounds reviewed. Judge Story uses the following language. "In order fully to understand the objection to this direction, it is necessary to advert to the third section of the act of 1793, which specifies the requisites to be complied with in procuring a patent, and the sixth section of the same act, which states certain defences, of which the defendant may avail himself to defeat the action, and to avoid the patent. The third section, among other things, requires the party applying for a patent, to deliver a written description of his invention, and of the manner of using, or process of compounding the same, in such full, clear, and exact terms, as to distinguish the same from all other things before known, and to enable any person skilled in the art or science, of which it is a branch, or with which it is most intimately connected, to make, compound, and use the same; and in the case of any machine, he shall fully explain the principle, and the several modes in which he has contemplated the application of that principle, or character, by which it may be distinguished from other inventions. The sixth section provides, among other things, that the defendant may give, in evidence, in his defence, that the specification filed by the plaintiff does not contain the whole truth relative to his discovery, or that it contains more than is necessary to produce the described effect, which concealment or addition, shall fully appear to have been made *for the purpose of deceiving the public.*"

"It is very clear, that the 6th section does not enumerate *all* the defences, of which the defendant may legally avail himself; for he may clearly give in evidence, that he never did the act attributed to him; that the patentee is an alien not entitled under the act; or, that he has a license or authority from the patentee. It is therefore argued, that if the specification be materially defective, or obscurely, or so loosely worded, that a skilful workman in that particular art, could not construct the machine, it is a good defence against the action, although no *intentional* deception has been practised. This is beyond all question, the doctrine of the common law; and it is founded in good reason; for the monopoly is granted upon the *express condition*, that the party shall make a full and explicit disclosure, so as to enable the public, at the expiration of his patent, to make and use the invention or improvement, in as ample and beneficial a manner, as the patentee himself. If therefore, it be so obscure, loose, and imperfect, that this cannot be done, it is defrauding the public of all the consideration, upon which the monopoly is granted. And the *motive* of the party, whether *innocent* or *otherwise*, becomes *immaterial*, because the public mischief remains the same. It is said, that the law is the same in the United States, notwithstanding the word-

ing of the 6th section; for there is a great distinction between a concealment of material parts, and a defective and ambiguous description of all the parts, and that in the latter case, although there may be no intentional concealment, yet the patent may be avoided for uncertainty, as to the subject matter of it. There is a considerable force in the distinction, at first view; and yet, upon more close consideration, it will be difficult to support it. What is a defective description, but a concealment of some parts, necessary to be known, in order to present a complete view of the mechanism? In the present case, the material defects were stated, among other things, to consist in a want of a specific description of the dimensions of the component parts, and of the shapes and position of the various knobs. Were these a concealment of material parts, or a defective and ambiguous disclosure of them? Could the Legislature have intended to pronounce, that the concealment of a material spring should not, *unless made with design to deceive the public*, avoid the patent, and yet, that an *obscure description* of the same spring, should *at all events* avoid it? It would be somewhat hazardous to attempt to sustain such a proposition. It was probably with a view to guard the public against the injury arising from defective specifications, that the statute requires the letters patent to be examined by the Attorney-General, and certified to be in conformity to the law, before the great seal is affixed to them. In point of practice, this must unavoidably be a very insufficient security, and the policy of the provision, that has changed the common law, may be very doubtful. This, however, is a consideration proper before *another* tribunal. *We* must administer the law as we find it. And, without going more at large into this point, we think, that the manifest intention of the Legislature was, *not to allow any defect or concealment in a specification to avoid the patent, unless it arose from an intention to deceive the public*. There is no ground therefore, on which we can support this objection."

Biographical Account of ALEXANDER WILSON, M. D. formerly Professor of Practical Astronomy in Glasgow, and the father of Type-founding in Scotland.

Abstracted from a paper in the 'Annals of Philosophy,' for November, 1826.

ALEXANDER WILSON, the subject of this memoir, was a younger son of Patrick Wilson, town-clerk of St. Andrews, and was born there in 1714. His father died whilst he was very young, and Alexander was brought up under the care of his mother, who was esteemed for her prudence, virtue and piety. After the usual preparation in different schools, he entered the College of St. Andrews, where he made great progress in literature and the sciences, and in his 19th year, received the degree of Master of Arts.

His favourite study was natural philosophy, particularly the branches of optics and astronomy. From his earliest years, he ex-