Many who are of the school of Tillock and Wolf, believe that the expansive power of steam depends upon heat only; while the Soho experiments are said to prove that elasticity depends simply on density, without regarding temperature, viz., that if a cubit foot of steam at atmospheric pressure, weighs one ounce, 50 atmospheres of steam would weigh 50 ounces; but Dalton, who is undoubtedly much nearer the true law, would make 50 atmospheres weigh but about 34 ounces.

I have no doubt that the nearer the atoms of water are made to approach each other, by compression, the greater will be the repulsive action of caloric, and that, in a more rapid ratio than has hitherto been allowed, especially in highly compressed steam. Its comparative density with the increase of power, diminishes faster than has been supposed even by Dalton.

FOR THE FRANKLIN JOURNAL.

MECHANICAL JURISPRUDENCE.—No. XVIII.

BY PETER A. BROWNE, ESQ.

On the Law of Patents for New and Useful Inventions.

[CONCLUDED.]

ON THE DEFENCE WHICH MAY BE MADE.

The different parts of the acts of Congress, respecting patents, may be thus arranged. The 6th section of the act of 1793, provides, that when any action is brought for a breach of the patent right, the defendant may plead the *general issue*. As the 3d section of the act of the 17th of April, 1800, (which was enacted to supply the 5th sec. of the act of 1793) provides, that the action shall be *on the case*, the general issue would be "*not guilty*."

Under the general issue, the defendant may give in evidence, the act of Congress. He may also give in evidence, any special matter, tending to prove either of the following things, viz.

1. That the specification, filed by the plaintiff, does not contain the whole truth relative to his discovery.

2. That the specification contains more than is necessary, to produce the desired effect.

3. 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.

4. That the patentee had, surreptitiously, obtained a patent for the discovery of another person.

To the 1st and 2d defences, the act adds, that the concealment, or addition, must fully appear to have been made for the purpose of deceiving the public. And in order that the plaintiff may not be taken by surprise, by giving either of these defences in evidence

under the general issue, the same section provides, that the defendant shall give to the plaintiff, or his attorney, notice in writing, of the special matter, thirty days before the trial.

The decisions under the foregoing heads may be thus arranged.

1st. *The specification or description does not contain the whole truth.*

In making this description, *no part* of the invention must be omitted, *the whole* must be described. Bul. n. p. 77. "If the specification be, in any part of it, materially defective, the patent is against law, and cannot be supported."

A patent was granted for making steel trusses, and the patentee omitted to state, that in tempering the steel, he rubbed it with tallow, and the patent was avoided. *Liardet v. Johnson*, cited in 1 Term. Rep. 602.

Nor must any mode that is more beneficial, be omitted. Brown took out a patent for a machine to make bobbin lace, and he omitted to describe the bending together two teeth of the dividers; and Lord C. J. Gibbs said, that "if this more beneficial mode of working was known to him, when he took out his patent, the patent would be void." 2 Marshall's Rep. 211. So in *Turner v. Winter*, 1 Term. Rep. 602, Buller, J. says, "If he makes the article with *cheaper* materials than those he has enumerated, the patent would be void."

2dly. *That the specification contains more than is necessary.*

In *Turner v. Winter*, 1 Term. Rep. 602, Buller, J. says, that "if the patentee could only make the article proposed, with two or three of the ingredients specified, and he has inserted others which will not answer the purpose, that will avoid the patent." So in *King v. Arkwright*, Buller, J. says, "if these things are of no use, but thrown in merely to puzzle, the patent is void."

3. *To make out a defence upon either of these grounds, under the act of Congress, it must be made to appear, that there was an intention to deceive the public.* *Whittemore v. Cutter*, 1 Gallisson's Rep. 429.

It must be understood, that although the act of Congress enumerates certain defences that the defendant may make, yet he is not confined to these. Judge Story, in the case of *Whittemore v. Cutter*, 1 Gallisson's Rep. 429, says, "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."

THE JUDGMENT.

Although the patentee, in *England*, has been defeated in one action, he may maintain fresh suits against other persons; as was done by Mr. Arkwright, and by Mr. Watt.

In *Arkwright v. Nightingale*, Davis' Patent Cases 53, Lord Loughborough expresses himself as follows, "It has been said, that many

persons have acted upon an idea that Mr. Arkwright had no right, he having failed to establish it when this cause underwent an examination in another place, in which the event was unfavourable to him. If the question at present were, what damages Mr. Arkwright should have received for the invading that right, I would have allowed the parties to have gone into evidence to show, to what extent persons had acted upon the faith of the former verdict; but the question now is upon the *mere right*: and if the result of this cause is in favour of the plaintiff, the verdict will be with one shilling damages. A future invasion of this right would entitle Mr. Arkwright to an action for damages, but in the present case they are not asked."

In the United States, the law is different: by the 6th sec. of the act of Congress of 1793, which is the one enumerating certain defences, which a defendant may make to a suit on a patent, it is declared, that "in either of which cases judgment shall be rendered for the defendant with costs, *and the patent shall be declared void.*"

OF THE REMEDY, IN ENGLAND, BY A BILL IN CHANCERY.

Beside the remedy, by action at law, for the infringement of a patent right, the English law gives another, which must now be noticed.

The patentee may file a bill in Chancery to establish his letters patent, and for a perpetual injunction against any one who undertakes to use his invention without his license.

In order to obtain the injunction, the party applying, must swear as to his belief, that he is the *original inventor*. *Hill v. Thompson*, 3 Merivale's Rep. 622. The Lord Chancellor observed, that "although when he obtained the patent, he might very honestly have sworn as to his belief of such being the fact, yet circumstances may have subsequently intervened, or information been communicated, sufficient to convince him that it was not his own original invention, and that he was under a mistake when he made his previous declaration to that effect."

To this bill filed by the plaintiff, the defendant may file his answer, denying the plaintiff's exclusive privilege; upon which the Lord Chancellor will direct an issue at law, to try the right. *If the patentee has been long in the exclusive enjoyment of his patent, an injunction will be issued against the party invading it, until the right is tried at law.* This was decided in *Harmer v. Plane*, 14 Vezey 130. This was upon a motion to dissolve an injunction, which had been obtained by the patentee of a machine for manufacturing woollen cloths, against one who had used it; and the Lord Chancellor observed, "there has been sufficient possession under this patent, to make it fit that it should be tried; taking care that it shall be tried speedily. It may be put in the shape of a case, stating the specification and facts, sufficient to introduce the question."

The injunction will be issued although the Chancellor has doubts whether the patent is good.

For this rule we have the authority of the case last cited. The Lord Chancellor prefaced the remarks above quoted, by this observation, "I feel very doubtful whether that (the allegation upon which the plaintiff founded his right) can be made good."

The same principle will be found in 6 Vezey, 707. The Universities of Oxford, &c. *v.* Robertson.

If the patent be clearly bad, the injunction will not be granted.

This may be collected from the case of Grierson *v.* Eyre, 9 Vezey, 341. It was a bill by the king's printer, in Ireland, to establish his right to print the statutes of Ireland, against the king's printer in England, and the court being clearly of opinion with the defendant, dismissed the bill.

Formerly the practice was, that the party was sent to law to establish his right, and then went into Chancery again, for account; as will appear by an anonymous case in 1 Vernon's Rep. 120. Upon a motion for an injunction to stop the sale of certain Bibles, the Lord Chancellor said "Let there be a trial at law, and let the king's patentee be plaintiff, and the defendants admit that they have sold 12 Bibles; and when the trial is over, come back again."—

As the right under letters patent appears on record, it has been held unnecessary to establish the right at law, previously to filing the Bill.

An exception however, must be stated to the last rule, which is this, that the court will not grant the injunction, in the first instance, where the patent is recent.

This distinction is taken in Hill *v.* Thompson, &c. 3 Merivale's Rep. 622. It was a bill praying an injunction, to restrain the defendants from selling, &c. any iron smelted, or worked, by the plaintiff's improvement, and the Lord Chancellor said "Where a patent has been granted, and an exclusive possession of some duration under it, the court will interpose its injunction, without putting the party previously to establish the validity of his patent, by an action at law; but where the patent is but of yesterday, and upon an application being made for an injunction, it is endeavoured to be shown, in opposition to it, that there is no good specification; or otherwise, that the patent ought not to have been granted; the court will not, from its own notions respecting the matter in dispute, act upon the presumed validity, or invalidity, of the patent, without the right having been ascertained by a previous trial; but will send the patentee to law, and oblige him to establish the validity of his patent in a court of law, before it will grant him the benefit of an injunction."

The verdict of the jury between the parties at law, will be considered by the Chancery Court, as final and conclusive. Hill *v.* Thompson, 3 Merivale's Rep. 631. *But the Court of Chancery, will give an opportunity to move for a new trial, in the Court of Law.* 3 Merivale's Rep. 631.

During the pendency of the suit at law, the Court of Chancery will oblige the defendant, to keep an account of the profits. 3 Merivale's Rep. 6.

OF PROCEEDINGS IN EQUITY IN THE CIRCUIT COURT OF THE UNITED STATES.

The equity side of the Circuit Court of the United States, will take no cognizance of a suit in equity, relating to a patent, between citizens of the same state, as Congress have not expressly given them that power.

Livingston and Fulton, were the proprietors of steam boats on the Hudson, and claimed the exclusive right to navigate the waters of New York in that way, by virtue of two patents from the United States, and several laws of New York. Van Ingen, and others, built, and were using, on the same river, a steam boat for carrying passengers, and were building another. The former filed a bill on the equity side of the Circuit Court of the United States, praying to be quieted in the possession, and enjoyment, of these rights, and an injunction to restrain the defendants from constructing, and using, the boats. All the parties were citizens of the state of New York.

The defendants contended, that the Circuit Court of the United States, as a Court of Equity, between citizens of the same state, had no jurisdiction of the cause. Livingston, J. delivered the opinion of the court, confirming the plea of the defendants, that its jurisdiction did not extend to cases of this description.

Every patron of American genius, will join me in regretting, that the power of administering this *remedial* justice, does not reside in some court of the United States. The wisdom of the English law, in this particular, in giving authority to its courts to interpose their powerful arms, to restrain the piratical invader of a patent right, must, I think, be acknowledged by all. Nor can we withhold our approbation from the equal manner in which the Courts of Chancery dispense justice to the patentee and the public, as explained in the present essay. If the invasion is glaring, they stop the invader's progress immediately: if it is too doubtful, they order the defendant to keep an account of his profits, to answer the plaintiff in case his right shall eventually be made to appear: if the patentee's pretensions are unsupported, they refuse their aid. In all cases their final decisions depend upon the patentee's right as established at law; to try which, fairly, and speedily, they oblige each party to concede matters of form.

For want of such a power in the United States, we have, more than once, seen persons, in defiance of justice, openly invading the patent rights of their fellow citizens, and enriching themselves with the spoils, while the patentee is pursuing a long protracted action of damages. It is for Congress, in their wisdom to apply a remedy for this evil.

PROCEDURE IN CONTESTING A PATENT IN THE DISTRICT COURT.

Another method of contesting a patent, for the fourth reason enumerated in the sixth section, is pointed out in the tenth section, which provides that "within three years after issuing the patent, upon an oath or affirmation being made before the judge of the Dis-

strict Court, where the patentee, his executors, administrators, or assigns, reside, that the patent was obtained *surreptitiously* or upon *false suggestion*, the court, upon motion made, if the matter alleged appears to be sufficient, may grant a rule to show cause why process shall not issue to repeal the patent. And if sufficient cause be not shown, the rule is to be made absolute, and process is to issue against the patentee, or his executors, administrators, or assigns, with costs of suit. And if no cause is shown, or if it shall appear that the patentee is not the true inventor or discoverer, judgment to be rendered to repeal the patent. If the party complaining has judgment given against him, he is to pay all the costs."

The practice under this section is, for some person to make affidavit of the facts upon which the application is founded. Upon the presentation of this *ex parte* affidavit to the District Court of the United States where the patentee, his executors, administrators, or assigns, reside, a rule is granted to show cause, on some day therein mentioned, why process should not issue against him or them, to repeal the patent. Upon the day of the return of this rule, if sufficient cause is not shown, the process issues. This process is a writ of *scire facias* to repeal the patent. To this writ the party, defendant, may plead, or demur, as best suits his defence.

If the question turns upon a matter of fact, a jury are summoned, and impanelled, as in other cases in that court.

In England this proceeding assumes the form of a writ of *scire facias*, which issues out of the Court of Chancery, to repeal a patent.

This writ, out of chancery, lies, in the ordinary course of justice, in three cases.

1. When the king, by several letters patent, grants the same thing to several persons, the former patentees have a *sci. fac.* to repeal the second letters. 4 Inst. 88.

2. When the patent has been obtained upon *false suggestions*; the king *jure regio*, may have the *scire facias*. 4 Inst. 88.

3. When the king grants any thing which by law he cannot grant, he, *jure regio*, may have the *scire facias*. 4 Inst. 88.

It would appear from an examination of the cases to be found in the English Books, of writs of *scire facias* to repeal patents, that any cause may be shown which would be a good defence in an action for an invasion of the patent right.

In *King v. Arkwright*, Westminster, 1785, cited Bul. N. P. 77. Davies on Patents, 61, three valid issues were joined: 1. That the patent was not new. 2. That the patentee was not the inventor. 3. That the specification was insufficient.

When any facts are disputed, issues are formed, and the parties are sent into a court of law to try them. If the issues are found against the patentee, the judgment is that the said letters patent be revoked, and declared void, and the enrolment be revoked.

But in the United States, in order to justify a judgment against a patentee, by virtue of this tenth section of the act of Congress, he must have been guilty of some *deception* or *misconduct*; he must

have used some *false suggestion*, or been guilty of some *surreptitious proceeding*. This was decided by Judge Davis, in the case of the proceeding to cancel Odiorn's patent, in the District Court of the United States, for the Massachusetts District, in December term, 1811.—MS.

The same appears in the case of Jeremiah Bailey's patent. Upon the affidavit of Oliver Evans, "that Bailey had obtained his patent upon false suggestion, to wit, upon the suggestion that he is the original inventor thereof." A rule was granted by the District Court of the Pennsylvania District, to show cause why process should not issue against Bailey, to repeal his patent. This rule was made absolute by consent, and without prejudice, and an amicable scire facias was taken out, and filed, to which Bailey appeared, and pleaded not guilty. The cause came on to be tried before the court, and a jury for that purpose summoned and impaneled, on the 21st day of June, 1814.

It was contended, on behalf of the relator, that if Bailey had been the true inventor, and had taken out his patent erroneously, supposing that he was the original inventor, when, in truth, the invention had been previously made by another, that this amounted, in law, to *false pretences*.

Peters, Judge, charged the jury to the following effect;—that the subject lay within a narrow compass. The proceeding (he said) was of a summary nature, and it would have a very dangerous tendency to extend the enquiry to the length that had been contended for by the counsel for the plaintiff. The question was, whether Bailey's patent had been *surreptitiously* obtained. He said, that he understood the expression in the 10th section, "*false suggestions*," to be tantamount to *surreptitiously*; and that the sufficient cause which is to be shown, is, that the party had obtained his patent *surreptitiously*, or upon false suggestions. That the distinction taken between the *true* and the *original* inventor, was important only as regarded the mode of proceeding. If the patentee was not the *true* inventor, it would justify this summary proceeding. The utility of Bailey's patent was not, he thought, a proper subject of enquiry at that time.

ON SURRENDERING A PATENT.

It has been doubted whether a patent can be surrendered, but this was decided by Thompson, J., in *Huntingdon v. Morris*, MS. rep. C. C. U. S. N. York.

"I see no objection to entering a *vacatur* of the patent of record in the department of state, if taken out inadvertently, and by mistake: all the proceedings in that department, on the subject of patents, are *ex parte*, except in the case of interfering applications. The department act rather ministerially, than judicially, and upon the representation of the applicant, without entering into an explanation of the question of right: and I see no good reason, why, on a like *ex parte* application, the patent might not be surrendered, and cancelled of record, if no misconduct was imputable to the patentee in

taking it out. The only record evidence of the patent, is that in the department of state, and in the letters patent in the hands of the patentee; and, if the letters patent are surrendered, and cancelled of record, the invention would be open to public use, without hazard, so far as depended on such patent.*

FOR THE FRANKLIN JOURNAL.

Observations on the received Theory of Falling Bodies, and an attempt to prove that it is, in part, incorrect. By THOMAS W. BAKWELL, Esq.

I SUBMIT the following remarks, with some degree of reluctance; and my hesitation in so doing has no slight grounds, for the principles set forth, and endeavoured to be sustained, are at variance with opinions which have been held to be indisputable, ever since the adoption of the Newtonian doctrine. I have, however, the more confidence in them, from their being in strict accordance with all the fundamental principles established thereby.

I contend that, all bodies falling by the attraction of gravitation, approach each other with the same velocity, in equal times, howsoever great, or small, the gravitating force may be; or howsoever great, or small, may be the quantity of matter contained in the bodies (or either of them) so attracted; and that the *rate* at which matter obeys gravitation, pervades the material universe, as fully as the attraction of gravitation *itself*. I also contend, and in consequence of the above opinions, that a (detached) pendulum, of given length, will not alter the times of its vibrations, in different latitudes, by reason of the oblateness of the earth at the poles, *increasing*, or the centrifugal force at the equator, *decreasing*, the effect of the attraction of gravity: nor would any increase, or diminution of the gravitating force, however great, alter the times of the pendulum's vibrations.

In endeavouring to establish these two positions, we must suppose, (as in all theoretical reasoning on these subjects) an absence of friction, of resisting medium, and of imperfection in the materials. We must also, for the sake of brevity, deal in round numbers, and precise terms, as much as possible; waiving fractional parts, and minute accuracy, where the omission does not affect the argument.

The force of gravitation is not in the least diminished by a body yielding to its impulse: for with whatever velocity one body may be falling towards another, it is attracted as strongly, when under that velocity, as if withheld from obeying it.

Therefore, the fall of bodies would be *instantaneous*, from any distance, however great, but for the *inertia* of matter, which is in all cases in the direct ratio of the attraction, (or weight.)

If a ball weighing one pound, were let fall from a height of 16 feet, it would reach the earth in one second of time. If a ball weighing 100 pounds, were to fall from the same height, it would also fall in

* For the purpose of easy reference, a distinct index to these essays will be furnished, in a future number.