

rity,) and to the metallurgic process for obtaining pure silver. For both objects, it is a matter of no consequence if some chloride should have escaped the action of the alkali. This chloride is left undissolved by the nitric acid, and is separated by filtration; while, if the oxide (not quite free from chloride) be mixed with a little nitre, or carbonate of potash, and fused, the whole silver is obtained with the utmost facility.* In order to give an idea of the ease with which the whole is performed, I may mention that I dissolved a half-crown, and obtained the whole of the silver it contained, within a very trifling fraction, (chiefly decanted in the *first* washing of the chloride, *but not lost*,) by the above process, *within two hours*, in a fused state. The silver was quite pure. There is no doubt that to chemists, also, an easy method of obtaining quickly pure oxide of silver, in a form much less hygrometric than the usual one, will be acceptable.

It is particularly to be noticed, that, if the chloride have *ONCE BEEN DRIED*, it is with great difficulty decomposed, even by a long boiling with potash.

King's College, Aberdeen, Jan. 20, 1843.

Ibid.

The Hot Blast Patent.

In the House of Lords, on Monday, March 6th, before the Lord Chancellor, and Lords Brougham and Campbell, the case of the "Househill Coal and Mining Company *vs.* Neilson and others," came up for decision.

The appellants in this case were the defendants in an action tried before the Court of Session in Scotland, for an alleged infringement by them of the hot blast patent, when a verdict was found against them; and came now before the House of Lords on a bill of exceptions, tendered by them against the charge of the learned judge, (Lord Justice Clerk,) who presided at the trial.

The Lord Chancellor. My lords, the principal question in this case arises out of the eleventh exception. The learned judge (who presided on the trial) stated to the jury what he considered to be sufficient evidence to support prior use, so as to invalidate the patent. The learned judge expressed himself in these terms. He says: "You will observe that it is settled that the trials founded on as a proof of prior use, must have been public—must have been continued, not abandoned—must have continued to the time when the patent was granted—I do not say to the very exact period, but it must have been known and used as a useful thing at the time." (After some observations on the meaning of the word "trials" as used by the presiding judge in the jury court, the Lord Chancellor continued—I understand the proposition of the learned judge to be this—that if the machine had been made, and had been put in trial, unless those trials had gone

* In fact, this process, imperfectly performed, is an excellent preliminary step, when a large quantity of chloride is to be reduced. The impure oxide requires so little alkali to complete its decomposition, that the crucible runs no risk. A little borax may be added as a flux.

on, and the machines had been used, up to the time of the granting of the letters patent, it would not be evidence of prior use so as to invalidate the letters patent. Now, I am obliged to say, with all deference to the learned judge, and with all respect to the learned judges of the Court of Session, that I think in that respect they are mistaken, and that, if it is proved distinctly that a machine of the same kind was in existence, and was in public use; that is, if use, or if trials, had been made of it in the eye, and in the presence, of the public, it is not necessary that it should come down to the time when the patent was granted. If it was discontinued, still that is sufficient evidence in support of the prior use, so as to invalidate the letters patent. If it is discontinued, provided it has been once in public use, and the recollection of it has not been altogether lost—if it has been once publicly used, it will be sufficient to invalidate the letters patent, although the use may be discontinued at the time when the patent was granted. Now, my lords, I apprehend that that is the law, and the known law, upon the subject in this country. I never heard it before questioned that the notorious public use of the invention, before the granting of letters patent, though it may have been discontinued, is sufficient to invalidate the letters patent. Then, my lords, the remaining question for consideration is this, and it is an important one, whether, if the learned judge laid down the law incorrectly to the jury, this was calculated to mislead the jury? (His lordship then explains how it was calculated to mislead, and says)—Therefore, it is perfectly obvious, that, if the learned judge be incorrect in the manner in which he stated the law, in the particular in which I have stated, it was calculated to mislead the jury. Under these circumstances, my lords, I should recommend your lordships to allow the eleventh exception, and to disallow all the rest.

Lord Brougham. My lords, I entirely agree in the view taken, and for the reason so luminously expressed, by my noble and learned friend on the woolsack. If we are of opinion, first, that the law has been mistaken, and, under a misapprehension of it, it has been erroneously delivered by the judge to the jury; and if we are, secondly, of opinion that the misdirection in point of law, the mistake in point of law, committed by the learned judge, had a direct tendency, I may almost say an inevitable tendency, to mislead the jury in the conclusion to which they should come, and in the verdict which they should render; then, my lords, both of these questions being answered in the affirmative, that the law was mistaken, and that the mistake tended to mislead the jury in their verdict, we have no choice, but must allow the exception. Now, my lords, a more important mistake in point of law, your lordships will give me leave to say, could not possibly have been made by the learned judge, than that into which the learned judge fell upon the present occasion. And I will not allow it to be said for one moment, in dealing with this question, that there is anything doubtful, that there is anything speculative, that there is any new law to be laid down, or even any new topics in respect of the law about to be broached here, in dealing with the direction of the learned judge; for I speak with all possible respect for that learn-

ed judge's great ability and experience in his profession in Scotland, when I say that this law, which has been mistaken here by his lordship, is a matter of as perfect certainty, as thoroughly known, and as little drawn into doubt, in Westminster Hall, where the law is administered touching the construction of the statute of James, the Patent Act, as any one branch of the law most commonly known, and most frequently administered, by our courts. It is one of the greatest errors that can be committed, in point of law, to say that, with respect to such an invention as that, it signifies one rush whether it was completely abandoned, or whether it was continued to be used down to the very date of the test of the patent, provided it was invented and publicly used at the time, twenty or thirty, or as, in this case, forty, years ago, it is perfectly immaterial; there being, in my apprehension, no kind of doubt that the jury would say—"Why should we consider whether it was used at the Bradley Works, or not? Why should we consider whether it was a trial, or a completed invention? Be it so that it was used forty years ago—be it so that it was a complete invention; we hear the learned Lord Justice Clerk telling us that we need not trouble ourselves upon these facts, for it is enough for us if it was abandoned, and that takes the facts out of the case, and leads us to find a verdict the other way." Upon these grounds, my lords, we have no choice in this application, it being a bill of exceptions; we have no hesitation in saying that the law was misconceived, and misstated to the jury. The law is undeniable, it is a matter of no doubt or hesitation with any man in this country who has been accustomed to administer it, or, I will venture to say, with any practitioner whose opinion is entitled to any weight; and I am also of opinion that the law so laid down tended to mislead, and must necessarily have tended to mislead, the jury. Upon these grounds, I have no hesitation in supporting the proposition of my noble and learned friend, that the eleventh exception must be allowed.

Lord Campbell. The only question is this, whether this misdirection shall be considered as immaterial? When I look at the form of the issue, I cannot say that it was immaterial, because the issue is, "whether the invention, as described in the said letters patent and specification, is the original invention of the pursuer." Now, you cannot say that it was the original invention of the pursuer within the meaning of the issue, if it had been publicly known and practised by others before the patent was granted. It has been said that there was no evidence; but I think that is a mistake—what conclusion the jury have come to I know not—but at the Bradley Iron Works there was such a machine, as Mr. Rutherford acknowledged at the bar, as would have amounted to an infraction of the patent, if the use of it had been subsequent to the patent. Then, that being so, I know not what conclusion the jury may have arrived at. They might have thought that this was a perfect machine, that it was the same machine, and that it had been publicly used. If they had been of that opinion, although it had been abandoned, they ought to have found a verdict for the defendant. Under the circumstances, I regret exceedingly that I am obliged to concur in the opinion that has been

expressed by my noble and learned friends, that this eleventh exception must be allowed; and the consequence of that will be, that there must be a *venire facias de novo*, and that the case must be tried by another jury.

Lond. Mech. Mag.

On a Method of Registering the Force actually transmitted through a Driving Belt. By EDWARD SANG, Esq., F.R.S.S.A., Professor of Civil Engineering, College, Manchester.

It is a desideratum to have the means of ascertaining how much force is actually consumed in the working of a machine. Whenever the motion is communicated by the intervention of a belt, or band, this can be very easily accomplished.

When we see a belt passed over two pulleys, and look without any narrow examination at the motion, we regard the action as a very simple one; there is more in it, however, than appears at first sight. For the sake of clearness, let us call the driving pulley the drum, and the other the pulley. The belt passed over them, whether plain or crossed, has two free parts, one of which *draws*, and the other *follows*. If it were possible that no force were needed to turn the pulley, these two free parts would be in the same state of tension; but whenever any resistance is made to the motion of the pulley, the drawing part is distended more, and the following part less, than usual; and experiments show that, within all practical limits, *this change is exactly proportional to the pressure necessary for overcoming the resistance.*

As the movement proceeds, the distended part of the belt is lapped over the drum, and, so to speak, the contracted part is lapped over the pulley, so that the circumference of the drum moves more swiftly than that of the pulley; thus, if the distension be 1 in 100, for 100 inches of the drum there would only be 99 inches of the pulley passed over.

The difference between the velocity of the drum and that of the pulley, thus indicates the pressure needed to carry the drum round. Now, this pressure, combined with the distance through which it acts, gives the force used; and hence the simple difference between the distances passed over by the circumference of the drum, and by that of the pulley, is exactly proportional to the force; *and we have only to contrive some method of registering this difference, in order to have a record of the total force transmitted by the belt.*

There may easily be contrived a variety of arrangements for showing the difference between the motions of the drum and pulley. Thus a pair of indicators may be fitted, one to each shaft, so as to tell the total number of turns made by each; from this number, by help of the measured diameter, the distance passed over by each circumference can be found, and thus the element for knowing the force transmitted can be had.

Or, otherwise, and this, perhaps, is the most convenient arrangement, a light pulley, having its circumference one foot, may be