

PROTECTION FOR INVENTIONS.

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By F. J. BRAMWELL, C.E., F.R.S.

(Continued from page 6.)

But even if there were no objections to secret manufacture and it could be carried on without the demoralization and risks of discovery I have shown to be attendant upon the exercise of it, such a manufacture is applicable only to those cases of invention, where the improvement is in the means, or process, and not in the article produced. A textile fabric, similar in its structure and appearance to those already known, may be better because it is cheaper, having been produced in an improved loom, and dyed by dyes, the use of which was hitherto unsuspected. In such a case secret manufacture is to a certain extent practicable, because the mere appearance of the cloth does not reveal by what means it was so cheaply made. As regards the weaving, however, the difficulty of secrecy would be great, but with respect to the dyeing, concealment might be more easy if the improvement consisted in the application of an ingredient which could be added by the inventor himself, or by some one or two persons whom he might trust.

But in the large class of inventions, where the product is an improved one, and the very inspection of it reveals the improvement, secrecy is obviously impossible. Let me, as an illustration, refer you to the Giffard injector. This invention (to which I shall again have to allude) is one applicable to the supplying of steam boilers with their feed water, and replaces the steam donkey pumps formerly used for that purpose. The very first mechanical engineer to whose hands one of these injectors came would take it to pieces, and at once ascertain the nature of its construction. In such an instance as this there can be no reward by secret manufacture.

In the case I have assumed, where it may perhaps be possible for an inventor to carry on a secret manufacture, I have taken (in favour of the advocate of such a system) the instance of a man having made an invention in his own trade, and being possessed of every facility for bringing that invention to a commercial result, but I believe it is not among inventors and inventions such as these that we must look for great improvements; the fact is, that the bulk, one might almost say the whole, of real substantive inventions have been made by persons not engaged in the particular pursuit to which those inventions relate.

Take a few instances. Watt was not a maker of steam engines, the fine-engines of his day, but he was a mathematical instrument maker, Arkwright, the inventor of the "water twist," was a barber, Cartwright, the inventor of the power loom, was a parson, Neilson, the inventor of the hot blast, was wholly unconnected with smelting operations, he was the manager of a gas works, Wheatstone, who has done so much for electric telegraphs, was engaged in the manufacture of musical instruments, and Ronalds, the very originator of the electric telegraph, had nothing to do with the visual telegraphs in use in his time; Bessemer, who has so enormously increased the manufacture of steel within the last quarter of a century, was in no way connected with that industry. The fish-joint for railways, the greatest improvement in permanent way that has been made since railways were introduced, was the invention of a carriage builder. I trust I have given instances enough to establish my position, that the great substantive inventions are made by persons unconnected with the manufacture or art to which those inventions relate, and we can readily see why this should be.

The person who has been brought up to pursue any particular manufacture has even before he had sufficient knowledge to be able to appreciate the merits and the principles of the processes he was taught to follow, been trained in the belief that "certain ends are to be obtained by particular means."

Under such circumstances, it is difficult for even a powerful mind to break through the trammels which have been imposed upon it, and to approach the consideration of the subject of the particular art with the same broadness of view, and power of detecting and grasping the true principles upon which that art is based, as would be possessed by a mind devoting itself to the subject for the first time, and thus the man untaught and unprejudiced in the art is more likely to

make substantive invention than is one who has been trained in it from his youth.

Improvements of detail such a person may make, but there, in all probability, will be the limit of his inventions.

One can understand that a man who had been taught from his boyhood to make steel by the process of cementation, that is by packing bars of wrought iron into brick boxes containing charcoal, and exposing the whole for several days to considerable heat, and thus carbonising the iron and producing blistered steel, might, not unnaturally, devise some improvement by which this process could be expedited, though one can hardly imagine such a man breaking with the traditions of the industry, and casting away the whole process of cementation. But one bringing a totally fresh mind to the consideration of steel manufacture would, in all probability, study the question from the very beginning, and would say, "What is steel? What is wrought iron? What is cast iron?" and when he discovered that steel was something between cast iron and wrought, that is to say, it contained less carbon than the one, and more than the other, and when he found that cast iron was a cheaper article than wrought iron (wrought iron being commonly produced from cast by practically abstracting the whole of its carbon), would seek a means by which he might abstract from cast iron, not the whole of the carbon, to leave wrought iron, but so much of the carbon as would leave steel.

To one brought up in the steel trade, the very word "steel" would be associated with the addition of carbon, and it would be most unlikely that he should attempt the manufacture by a process which had for its object the taking away of carbon.

Once concede that the great inventions are made by "outsiders," then it appears to me that to continue this, the highest class of invention, protection is an absolute necessity. An inventor must nearly in every case make trials and experiments, and these, as a rule, can only be conveniently done in places where the manufacture is being exercised; but now we are assuming that the inventor is not engaged in the manufacture, he has, therefore, either to incur great expense to make his experiments, an expense in many cases prohibitory, or to forego the experiments altogether, or else he must seek the aid, and trust to the honour of, some manufacturer.

Imagine a country clergyman who has a knowledge of chemistry making an invention of an improvement in smelting iron ore. If he were a man of real ability, as I have supposed, he would appreciate the great complexity, and the many practical difficulties, of that process, and he would know that nothing short of a trial of this invention in the actual furnace could assure him that his method would not be frustrated by some such difficulty.

What, without a patent law, is that inventor to do? Forego the trial? Devote £5,000 of the large property which usually belongs to a country clergyman, to the erection of an experimental blast furnace, trust to the honour of a manufacturer, or give up the invention? I think the probability is, he would pursue the last course, and that thus the invention would be lost to the community.

But even supposing the preliminary difficulty of a practical trial not to exist. Assume for example that the invention be one such as that of the Giffard injector, already mentioned, one of the most substantive of the present day. This might have been tried in private by its inventor without insuperable difficulty, even although he were wholly unconnected with any of the mechanical arts, and he might have perfected his invention in every detail. But when he had done this, what would have been his chance of reward, how would he have set about reaping the pecuniary benefit which he would desire, and which would be his reasonable due? Would he make up his mind to forego all his usual habit of life and to become a manufacturer?

Say that he did so, and that in spite of the difficulties to which I shall have to revert, he succeeded in making a certain number of the injectors for sale, and that then, he knew enough of business to obtain purchasers for them, what would be the inevitable result? As I have already said, when taking the instance of this implement as one impossible to make the subject of a secret manufacture, the very first mechanical engineer (a steam pump-maker) into whose hands one of these injectors fell, would say, "Here is an implement that appears likely to compete seriously with the use of steam-pumps. Why should not I make it? At present I know it is being manufactured by the inventor only, a person who was not