

# Holtzapffel Documents

## Correspondence

ENGLISH MECHANIC AND WORLD OF SCIENCE: No. 882, FEB. 17, 1882. p. 566-7

### LATHES AND LATHE-MAKING

[19731.]—I have to thank you for the too-flattering note you have been good enough to append to my letter appearing in your last issue, and I must ask you to allow me to express my regret that I fear my general affairs will not leave me time for taking any considerable advantage of so courteously expressed an invitation.

Partially from this, but also from other reasons, I have not seen your admirably conducted paper for a rather long period; but a natural curiosity would have led me to desire to learn the precise gravamen of Dr. Edmunds' late complaint, had not that information been afforded me by several of your subscribers, coupled with the expression of a feeling that the matter required some further notice; and this, with your permission, I will undertake.

Turning to your correspondent's letter, No 19675, in reply to Dr. Edmunds' inquiries for the meaning attached to certain letters, as applied to screwthreads, I read as follows: "The above J, N, &c., and many others, are looked upon somewhat as private property, and, I believe, can only be had from myself or from Messrs. Holtzapffel who use the game threads as I do in such work."

The decision as to whether the modesty or the candour of this astounding statement is the more to be admired, I leave to others; venturing only to say that the series of threads in question in the possession of the gentleman who penned the above sentence, can only be his private property in the sense that he has acquired them by purchase, or by less direct means seldom adopted. On the other hand, that they are the private property of Holtzapffel and Co., may probably be considered just, in the sense that they are their set of original standard threads—a fact of which it is hard to believe your correspondent could have been unaware; while, in another sense, they are equally removed from the privacy under which he would shroud them, by virtue of their continuous publication for a long series of years through their constant manufacture and demand.

The reticence of the reply must, therefore, remain what Dr. Edmunds styles an enigma, unless the key is to be in the not improbable, though trifling, circumstance that Mr. Evans was in complete ignorance of the respective values and dimensions of the taps and dies upon which he was questioned. It is, at least, difficult to avoid arriving at this conclusion, if it be true, as I am informed, that your correspondent has more than once written such phrases as, "I cheerfully endeavour to write what I know, in the hope that it may help" and I venture to think that he would have lost nothing by candidly admitting one exception to his powers of imparting information.

Your very cordial invitation emboldens me to take this opportunity to fill a lacuna in my former letter, and then to offer a few words upon the article standing at the head of your last issue.

Dr. Edmunds and your readers are already in possession of the information he asked for by a line or two in my last; but a word or two more, together with a list of the diameters of the taps in question, may not be unacceptable, and will include all that requires saying on the subject, without, I hope, unduly overburdening your pages.

The taps A, B, and C, not previously mentioned, are of Nos. 1, 2, and 3 H. and Co.'s threads respectively, and the diameters of the whole series are as follows—viz.: A 1.0, B .875, C .75, D .56, E .50, F .45, G .41, H .36, I .33, J .29, K .25, L .24, M .21, N .20, O .19, P .18, Q .1625, R .15, S .135, T .12, U .10.

There is one other size between C and D which is .625 diameter and No. 4 thread. The foregoing series of taps are grouped in separate diestocks; the following being those the more used for the purposes mentioned in my last, viz., 16in. diestock, D, E, F, H; 12in., U, I, K, M; 9in. J, L, O, Q; and 6in. N, P, R, T. A 4-1/2in. diestock, cutting 50, 70, and 100 H. and Co.'s threads to the inch has also been added to the above. The necessity for gradually reducing size and weight in the diestocks needs no comment to your readers, and the above particulars are only given in anticipation of a possible question, the reply to which is, that a purely consecutive grouping of the diameters assigned to every diestock was avoided, to afford every set a greater difference in and a wider range over diameter; whence it results that one sized diestock will often serve the purpose of one individual, and the taps in any two diestocks overlap.

The angles of the deep and shallow threads have been already published, and the deep threads find by far the more extensive use, see Vols. II. and IV.

*Turning and Mechanical Manipulation.*—I venture now on a few words in criticism of your correspondent's paper on the Rose-cutting Frame. It might have been, perhaps, more graceful, had he named the original source of so comparatively late an addition to the apparatus for ornamental turning; and upon this I would only remark, that it would certainly have spared me the necessity of saying that the instrument described in your last number as made by Mr. Evans is, so far as it lies in his power, nothing more than a copy of that issued by H. and Co.

It is perfectly correct that the tool-slide of the Rose-cutting, frame was at first but half its present length. I think six of these instruments were so made, but the real improvement arising from doubling the length of the slide was so immediately manifest, that most of these were converted to the new pattern, which has acquired no subsequent modification. Your correspondent is perhaps rather obscure upon this double action, and he does not appear to be aware of one important, feature. When the tool is anywhere between the axis of its revolution and the micrometer head of the main-screw by which it is traversed,—when its positions may be distinguished as being on the other side of the centre—it reproduces the undulations on the rosette, whether they be concave or convex; but so soon as the tool occupies any position upon the other half of the main-slide—when it may be said to be past the centre—it produces the converse of any rosette employed, cutting concave undulations from convex curvatures upon the rosette, and convex from concave. This in effect doubles the results obtained from any series of rosettes—alone an important economic consideration; but it also has an incidental and scarcely less important value, which is, that in producing concave rose undulations on the work, by which is meant all those in which the points of meeting of component curvatures point outwards from the

general centre of the work, these points are far more acute and otherwise perfect when they are obtained from a convex rosette by means of the above-named reversal, than when obtained as direct copies of a concave rosette with the tool on the hither side of the centre.

The apparent advantages of the employment of a drill were by no means overlooked by the originator of the rose-cutting frame, but were considered open to question for the following reasons: The fixed tool has the peculiar property of accumulating all elasticity against the direction in which it is cutting, with the effect of producing a higher degree of polished finish in the lines of surface patterns, or upon the mouldings and fillets of more deeply-cut ornamentation than can be approached by other means. The latter class of ornament may be cut with a fixed tool to a quarter or three-eighths of an inch in depth, usually sufficient, with no very great expenditure of time, and for increased depths by preparing the work in steps and attacking each seriatim; and, lastly, all patterns cut with a fixed tool may be continued absolutely to the centre, in which respect the rose-cutting frame has the advantage over the rose-engine. The *drill*, on the other hand, possesses the advantage of comparative rapidity; but, in other respects, the previously-mentioned absorption of elasticity is considerably diminished, and notwithstanding the correct advocacy of using a winch-handle upon the square head of the tangent-screw that carries the driving-pulley, the originality of which improvement is willingly conceded as claimed, this circumstance deprives the ornament of its otherwise clean continuous-cutting and brilliant finish. The pattern can no longer be carried to the centre of the work, by reason of the necessary diameter of the revolving-drill; but that is of little importance. But this question of the diameter of the drill becomes of importance from another aspect—namely, that it obliterates all re-entering angles, which, with the fixed tool, are perfectly sharp, thus robbing the work of half its beauty. These drawbacks are greatly against the employment of the drill; while, so far as I can judge, the form that has taken under Mr. Evans' invention is not calculated to reduce them, this particular improvement being apparently mechanically faulty owing to its length and the smallness of its base. The real objection to the drill, however, does not lie in any particular construction, as that could be modified without difficulty, but is found in its cutting action, and is inherent to any.

John J. Holtzapffel

64, Charing-cross, S.W., Feb. 13th.