RULES FOR CONSTRUCTING A PINNACLE.

AS GIVEN BY MATHIAS RORICZER IN 1486.

It is highly probable that much valuable information may still remain unnoticed amongst ancient records, such more especially as the fabric rolls preserved with the muniments of cathedral or collegiate foundations, which would throw a new and important light on the technical practices of medieval architects, the rules and terms of art, or the mechanical contrivances by which their operations were facilitated. Much may be anticipated from the intelligent research which in recent times has been bestowed upon these subjects, more particularly in Germany. A valuable specimen of the evidences serving to illustrate the practice and rules of design, observed by architects in the middle ages, has recently been brought forward in that country, to which, as connected with the subject of Mr. Rickman's enquiries in the preceding paper, we would take this occasion to call the attention of our readers. It is a treatise on the construction of "Fialen," or pinnacles, written, about the year 1486, by Mathias Roriczer, an architect of Ratisbon, in the peculiar local dialect familiar to him, and recently reprinted in its original obsolete language, as also in the form of a modernized version[a].

This little essay is extremely interesting and valuable, from the period at which it was written and published, whilst Gothic Architecture was still flourishing, proving as it does the strictly geometrical principles on which the architects of that period constructed their working drawings; and as the traditions of the two previous centuries could scarcely then have been lost, we may fairly presume that the freemasons of an earlier age were equally well acquainted with geometry, both in theory and practice. So precise and minute are the instructions here given, from the first drawing of the simple square block through every stage of the process, till we have

[a] The original was reprinted by Carl Heideloff, in his work entitled, Die Bauhütte des Mittelalters in Deutschland, Nurnberg, 1844; and a translation into modern German appeared at Treves in 1845, with a preface by A. Reichensperger. The first page of the original is embellished with the episcopal insignia, the arms of the family of Reichenau and of the monastery impaled, with this motto:

WILHELMUS . EPISCOPUS . EUSTETENSIS .
EX . FAMILIA . REICHENAW . NATUS .
HEC . IMPRIMI . FECIT . ANNO . DNI .
MCCCCLXXXVI.

the finished pinnacle and canopy, that an accomplished modern architect, however good a mathematician he may be, could hardly give his pupil better practice or clearer directions than to copy the diagrams, and work out the problems here given. But as we cannot expect the readers of the Archæological Journal to be prepared to follow the minutiæ of a mathematical treatise, we must content ourselves with a few specimens, and present them with a reduced series of the diagrams which will be generally appreciated, while those mathematicians who wish to do so can without difficulty draw out the definitions for themselves.

The first part teaches how "To raise a pinnacle (Fiale) from its foundation, according to the mason's art, and the rules of geometry."

1. Make a square as annexed, with the letters *a b c d*. This is the size of the block out of which the pinnacle is to be cut.

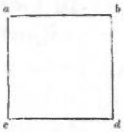


Fig 1.

2. Make a square the same size as the previous figure, divide the line *a b* into two equal parts, and place *e* on the division, do the same on the other sides, and join the letters *e h f g*.

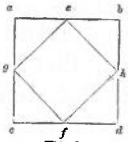


Fig. 2.

3. Make a figure the same as the last, divide *e h* at *k*, repeat this on the other sides, then rule the square *i k l m*.

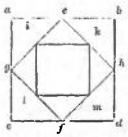


Fig. 3.

4. Then turn the square *e h g f*, as in the following figure. The outer square is the plinth, the next the shaft, and the inner one the thickness at the bottom of the panel.

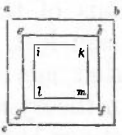


Fig. 4.

5. Draw again the figure as before, then carry the line *i l* till it cuts *e h* and *g f*, then place *n*, and do the same at the other corners of the figure.

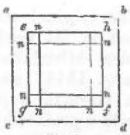


Fig. 5.

Fig. 9.

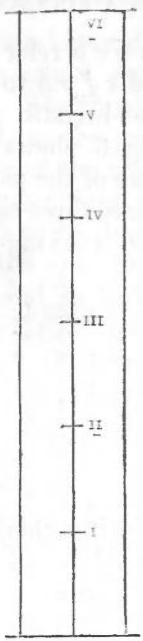


Fig. 10.

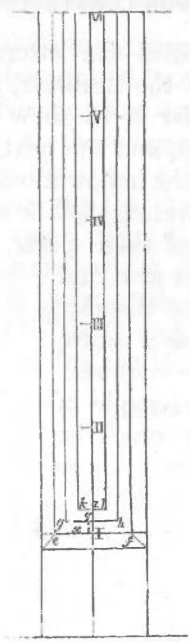


Fig. 11.

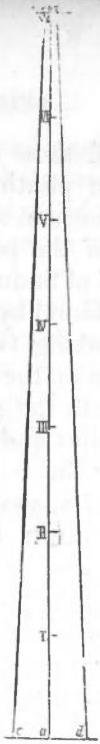


Fig. 12.

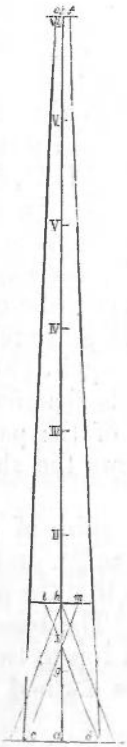


Fig. 13.

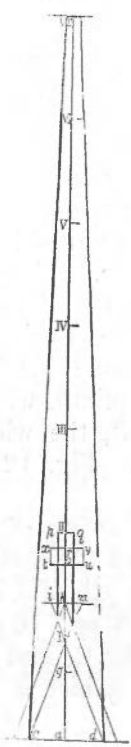


Fig. 14.

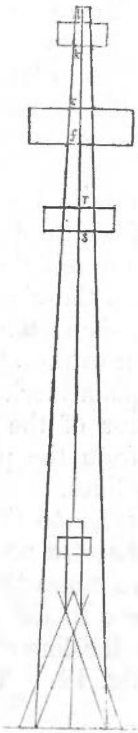


Fig. 15

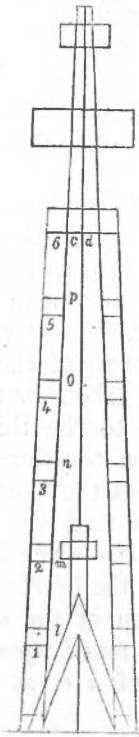


Fig. 16

In all these figures the letters *a b c d* refer to the square block or plinth of the pinnacle, and *e f g h* to the shaft, and the intention so far is to shew the breadth and depth of the panel, and the next, fig. 6, shews the method of finding the hollow moulding of the panel. This is found by dividing the line *n i* into three equal parts, taking two of these parts, and marking the distance on the line at *o*, and then with the same distance as a radius and *o* as a centre striking the curves required.

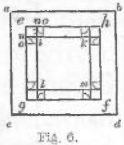


Fig. 6.

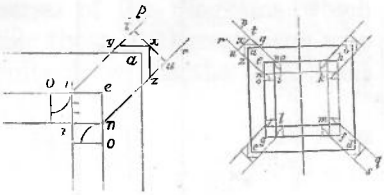


Fig. 7.

Fig. 7 shews the mode of laying down the crockets. This is done by drawing lines parallel to the diagonal of the square through *n n*—*n n*, and producing them as far as *p q r s*, then take double the width of *p r* and set it off from *n* towards *p*, and this gives the projection of the crocket.

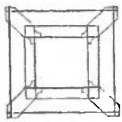


Fig 8.

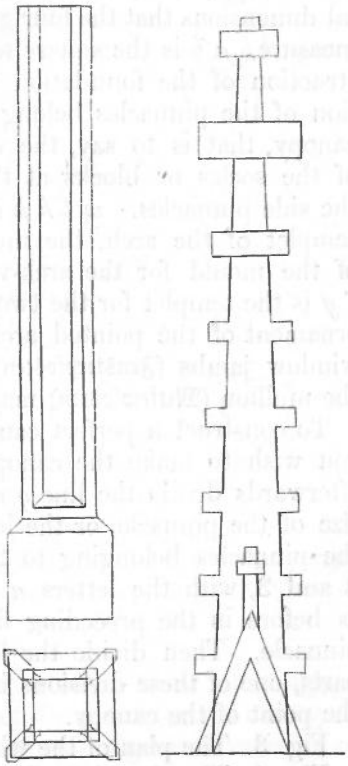
Fig. 8 shews this without the working lines.

The next figures refer to the elevation of the pinnacle, and we are directed to draw an upright line, which is called the middle ridge, and on this to lay out six times the distance *a b*, fig. 1, which gives the height of the pinnacle, so that the height of the pinnacle is six times the breadth of the square block or plinth. These divisions are to be marked I, II, &c. (fig. 9.) and form a scale for the remaining ones. In the next, fig. 10, the half width of the original block *a b*, is to be set out on each side the middle ridge. This gives the size of the stone out of which the shaft of the pinnacle is to be cut, and the next, fig. 11, shews the mode of transferring the measurements of the plan to the elevation: the first square (to I) being taken for the plain block or plinth, which is chamfered down to the thickness of the shaft, the width of the panel is then transferred from the plan. Fig. 12 shews the shaft without the working lines.

The next figures refer to the drawing of the spire of the pinnacle. We are directed to draw the middle ridge, and to make the height seven times the length of *a b*, so that the proportion of the spire is to the shaft as 7 to 6. The base is to be made equal to the line *e h*, fig. 6, and the top to twice that of *n o*, as in fig. 12. The gablet is then formed by

dividing the two lower divisions into three equal parts, two of which give its height, and the original line *a b* the width at its base, fig. 13. The third division gives the height of the finial which is fixed on the gable at the intersections of the inner and outer lines of the coping, fig. 14.

The remaining figures refer to the drawing of the finial. The last fig. is to be drawn again, fig. 15, and the length *a b* set off from the apex downward, which gives the top of the large foliage, and its width is to be made equal to *a b*. This width is to be divided into three parts, and one of these parts set off downward for the depth of the foliage. The upper foliage is found by taking the distance between the outer square and the next fig. 4; and setting it from the point downwards, marks the upper line of the foliage, which is to be made equal in width to the inner square of fig. 4, and its depth one-third of its width. The same distance and thickness must be set off *below* the large foliage for the neck-moulding, the width of which is to be equal to the second square in fig. 4.



The next, fig. 16, shews the method of laying off the crockets. The distance below the neck-moulding is to be divided into six parts, and on these the thickness and projection of crockets is set off from the plan, fig. 7. The next figures shew the plan, shaft, and spire of the pinnacle complete without the working lines, and the treatise concludes by directing the spire to be set on the shaft, and "it is then a perfect pinnacle carried up from the foundation."

The second part treats "of the construction of a canopy."

"To make the templets or moulds (Massbretter, Chablonen) for the single parts and for the flowers (or crockets) of a canopy."

"Begin and make the square of the pinnacle exactly as the foundation of the pinnacle in the preceding figures."

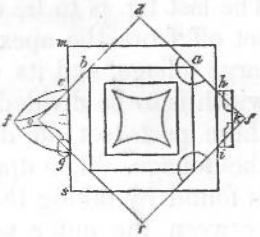


Fig. 1

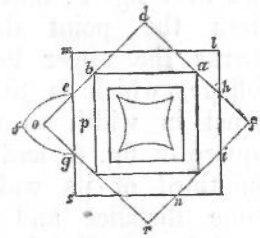


Fig. 2.

Fig. 1. On the square *a b* lay another larger one *d f r o*, on this another of the same size *m s*. So you have the right squares out of which the crockets (Blume) and mouldings (Massbretter) shall be made. *d f r o* is the large flower or finial on the gable point of the canopy, according to the horizontal dimensions that the four great leaves measure. *a b* is the square for the construction of the foundation and elevation of the pinnacles belonging to the canopy, that is to say, the dimensions of the socles or blocks at the base of the side pinnacles. *m l h k i n s* is the templet of the arch, the measurement of the mould for the arch-voussoirs, *e f g* is the templet for the two legs of the carved gable-formed ornament of the pointed arch, *h k i* is the mould for half of window jambs (Fensterpfosten) from which also the mould for the mullion (Mittelpfosten) may be found.

To construct a perfect canopy (Wimperge). Take the width you wish to make the canopy, set it on the line *q r* fig. 3, afterwards divide the line *q r* into six equal parts, one is the size of the pinnacle, or the length of one side of the plan of the pinnacles belonging to the canopy drawn in the figures 2 and 3, with the letters *a* and *b*, and divide the pinnacle as before in the preceding figures for the construction of a pinnacle. Then divide the length of the pinnacle into three parts, one of these divisions is the height of the finial above the point of the canopy.

Fig. 3. The plan of the whole canopy.

Fig. 4. The elevation of the canopy.

Fig. 5. The finial at large shewing the foliage.

Fig. 6. The plan of the finial.

The letters of reference on the elevations correspond with those on the plans.

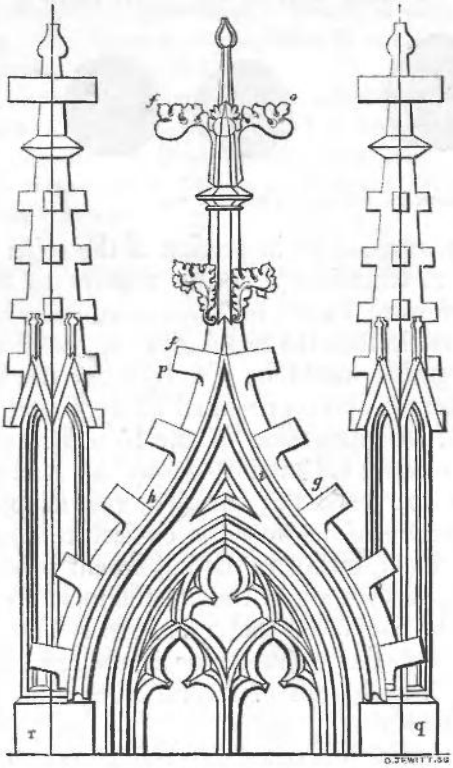


Fig. 4

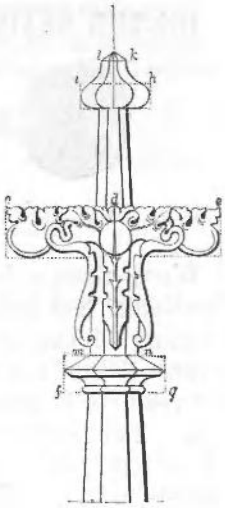


Fig. 5.

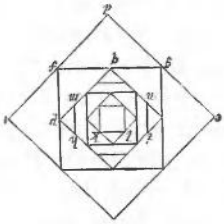


Fig. 6

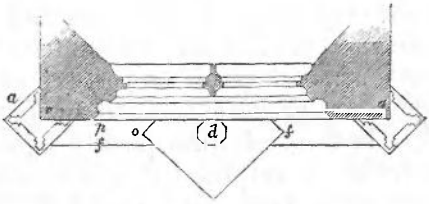


Fig. 3.

The strictly geometrical character of all these drawings is sufficiently evident, but figure 1 of the plans for the canopy is especially remarkable for the clever and ingenious manner in which all the varied parts are worked out on one diagram: this makes it look rather confused at first sight, but on a careful examination, the whole may be clearly made out. After this the others are all simple and easy to understand.