are frames, including the main and ſtern frames. Up­on ME deſcribe the equilateral triangle MSE, and draw lines from the vertex S to each point of diviſion ; then the line SM will be that anſwering to the main frame, and SE that correſponding to the poſt ; and the other lines will be thoſe anſwering to the intermediate frames in order.

Let fig. 23. be the projection of part of the ſtern on the plane of elevation, together with the eighth and ninth frames. From the points L, N, G, (fig. 21.) draw the lines LO, NP, GQ, perpendicular to the plane of the upper edge of the keel. Make AB (fig. 23.) equal to AF (fig. 21.), and draw the water line BCD. Draw the line BC (fig. 22.) ſo that it may be parallel to the baſe oſ the triangle, and equal to CD ( fig. 23.), which produce indefinitely towards H. Make BD equal to BC (fig. 23.), and draw the dotted line SD (fig. 22.) The ribband FC (fig. 21.) is to be ap­plied to the triangle, ſo that it may be parallel to the baſe, and contained between the line MS and the dot­ted line SD. Let *cf* repreſent this line ; then transfer the ſeveral diviſions from *cf* to the ribband CF (fig. 21.), and number them accordingly. Again, make EF (fig. 23.) equal to LO (fig. 21.), and draw the water line FGH ; make BF (fig. 22.) equal to FG (fig. 23.), and draw the dotted line SF ; apply the ſecond ribband LK to the triangle, ſo that the extremity K may be on the line SM, and the other extremity L on the dot­ted line SF, and making with SM an angle of about 624 degrees. Let kl be this line, and transfer the divi­ſions from it to the ribband KL. In like manner make IK (ſig. 23.) equal to NP (fig. 21.), and draw the wa­ter line KLM. Make BG (fig. 22.) equal to KL (fig. 23.), and draw the dotted line SG ; then the ribband MN is to be applied to the triangle in ſuch a manner that its extremities M and N may be upon the lines SM, SG reſpectively, and that it may make an angle of about 68 degrees with the line SM ; and the divi­ſions are to be transferred from it to the ribband MN. The ſame proceſs is to be followed to divide the other ribbands, obſerving to apply the fourth ribband to the triangle, ſo that it may make an angle of 86 degrees with the line SM ; the fifth ribband to make an angle of 65 degrees, and the ſixth an angle of 60 degrees with the line SM.

The quantities of theſe angles are, however, far from being preciſely fixed. Some conſtructors, in applying the ribbands to the triangle, make them all parallel to its baſe ; and others vary the meaſures of theſe angles according to fancy. It may alſo be remarked, that a different method of dividing the baſe of the triangle is uſed by ſome. It is certainly proper to try different methods ; and that is to be preferred which beſt anſwers the intended purpoſe.

Beſide the frames already mentioned, there are other two laid down by ſome conſtructors in the ſeveral plans, called *balance frames.* The after balance frame is placed at one fourth of the length of the ſhip before the ſtern­poſt ; and the other, commonly called the *looſ frame,* at one fourth oſ the ſhip’s length aft of a pernendicular to

the keel from the rabbet of the ſtem. Let the dotted line at X, between the fifth and ſixth frames, (fig. 23.) be the place of the after balance frame in the plane of elevation. Then, in order to lay down this frame in the plane of projection, its repreſentation muſt be previouſly drawn in the triangle. To accomplish this, draw the line SV (ſig. 22.) ſo that the interval 5V may have the ſame ratio to 5 6 (fig. 22.) that 5 X has to 5 6 (fig. 23.) @@(D). Then the ſeveral points in the ribbands in the plane of projection anſwering to this frame are to be found by means of the triangle in the ſame manner as before.

The loof frame is nearly of the ſame dimenſions as the after balance frame, or rather of a little greater ca­pacity, in order that the centre of gravity of that part of the ſhip may be nearly in the plane of the midſhip frame. Hence the loof frame may be eaſily drawn in the plane of projection, and hence alſo the other frames in the fore body may be readily deſcribed.

Prob. X. To deſcribe the frames in the fore body.

Draw the middle line of the ſtem AB (fig. 24.) ∙ make AC, BD each equal to half the thickneſs of the ſtem, and draw the line CD ; deſcribe alſo one half of the main frame CEFGHI. Let eE, fF,, gG, hH, be water lines at the heights of the ribbands on the main frame ; alſo let *a* be the termination of the floor ribband, and *b* that of the breadth ribband on the ſtem. Divide the interval a *b* into three equal parts in the points *c, d,* and draw the ribbands aE, cF, *dG,* and bH. Make ei, fk, gl, hm (fig. 24.) equal to *ei, f k, g l, hm*(fig. 21.) reſpectively, and draw the curve *Ciklm,* which will be the projection of the loof frame. Or ſince it is neceſſary that the capacity of the loof frame ſhould be a little greater than that of the after balance frame, each of the above lines may be increaſed by a propor­tional part of itſelf, as one-tenth or one-twentieth, as may be judged proper.

Conſtruct the triangle (fig. 25.) in the ſame manner as fig. 22. only obſerving, that as there are fewer frames in the fore than in the after body, its baſe will therefore be divided into fewer parts. Let there be eight frames in the fore body, then there will be eight diviſions in the baſe of the triangle beſide the extremes.

Let fig. 26. repreſent the ſtem and part of the fore- body in the plane of elevation, and let O be the place of the loof frame. Divide the interval 4, 5 (fig. 25.) ſo that 4, 5 may be to 4 Z as 4, 5 to 4, o (fig. 26.), and draw the dotted line SZ, which will be the line de­noting the loof frame in the triangle.

Draw the lines AB, CD, EF, GH (fig. 26.) paral­lel to the keel, and whoſe perpendicular diſtances there­from may be equal to *C a, Cc,* C *d, Cb,* (fig. 24.) the interſections of theſe lines with the rabbet of the ſtem, namely, the points I, K, L, M will be the points of termination of the ſeveral ribbands on the ſtem in the plane of elevation. Divide 8 A (fig. 25.) ſo that 8B,

8 C, 8 D, and 8 E, may be reſpectively equal to BI, DK, FL, and HM (fig. 26.), and draw the dotted lines SB, SC, SD, SE (fig. 25.) Apply the edge of a flip of card to the firſt ribband (fig. 24. ), and mark

@@@(d) It is evident, from the method uſed to di’vide the baſe of the triangle, that this proportion does not agree exactly with the conſtruction ; the difference, however, being ſmall, is therefore neglected in practice.