foreſide oſ the after bits be the aft part of the foremoſt magazine, drawing the bulkhead thereof, which will come to the aft side of the sixth beam ; therefore, from the sixth beam to the foremoſt end of the orlop, the plank and beams will be repreſented juſt in the ſame manner as before mentioned for the after part of the orlop : then the midſhip part of the deck will be re­preſented by letting the upper line be the upper side of the plank, and likewiſe the upper side of the beams ; and the lower line will repreſent the lower edge of the plank, only drawing it from beam to beam, and obſer­ving not to let it paſs through them.

The hatchways, &c. may now be repreſented on the orlop, letting the main, fore, and after hatchway, be exactly under thoſe of the gun-deck : there muſt be one over the fiſh room, and one over the spirit room. There muſt be two ſcuttles over the after magazine for the passage to the magazine and light room. There ſhould alſo be one afore the fourth beam from forward for the passage to the fore magazine, and one abaft the ſecond beam for the paſſage to the light room.

The bulkheads for the fore and after parts of the well may be drawn from the lower deck beams to the orlop, and from thence to the limber ſtrake in the hold. The ſhot lockers may alſo be repreſented, having one afore and one abaft the well : there ſhould alſo be one abaft the foremoſt magazine, the ends of which may be formed by the after bits. The ſteps of the masts may be drawn in by continuing their centres down to the limber ſtrake ; and likewiſe two crutches abaft the mizen ſtep divided equally between that and the after part of the cutting down : the breaſt hooks may alſo be drawn letting them be five in number below the lower deck hook, and all equally divided between that and the fore ſtep. Hence every part of the inboard is decribed as far as neceſtary.

Chap. V. *Of the Method of Whole-moulding.*

Having now finiſhed the methods of laying down the ſeveral plans of a ſhip, any farther addition on this ſubject might appear unnecessary. We cannot, however, with propriety, omit to deſcribe the method called *whole-moulding,* uſed by the ancients, and which still continues in uſe among thoſe unacquainted with the more proper methods already explained. This method will be illuſtrated by laying down the ſeveral plans of a longboat; the length of the keel being 29 feet, and breadth moulded nine ſeet.

Draw the ſtraight line PO (fig. 37.) equal to 29 feet, the extreme length oſ the boat, and alſo to repre­ſent the upper edge of the keel. Let ⊕ be the ſtation of the midſhip frame. From the points P, ⊕, and O, draw the lines PT, ⊕M, and OS, perpendicular to PO. Make ⊕M, ⊕N, equal to the upper and lower heights of breadth reſpectively at the main frame, PT the height of breadth at the tranſom, and OS the height at the ſtem. Deſcribe the curve TMS to repreſent the ſheer or extreme height of the side, which in a ſhip would be called the *upper height oſ breadth line,* or up­per edge of the wale. Through the point N draw a curve parallel to TMS, to repreſent the breadth of the upper ſtrake of a boat, or lower edge of the wale if in

a ſhip. The dotted line TNS may alſo be drawn to repreſent the lower height of breadth.

Set off the rake of the port from P to *p,* and draw the line *p t* to repreſent the aft side of the port ; then T *t* will repreſent the round up of the tranſom. Set off the breadth of the port from *p* to r, and from T to s, and draw the line *r* s to repreſent the foreside of the port, which may either be a curve or a ſtraight line at pleaſure. Set up the height of the tuck from *p* to *k.* Let *k* X be the thickneſs of the tranſom, and draw the line ZX to repreſent the foreside of the tranſom.

There is given the point S, the height of the ſheer on the foreside of the ſtem ; now that side of the ſtem is to be formed either by ſweeps or some other contri­vance. Set off the breadth of the ſtem, and form the aft side of it.

Set up the dead-rising from ⊕ to d, and form the rising line r i s. Draw the line KL parallel to PO to repreſent the lower edge of the keel, and another to re­preſent the thickneſs of the plank or the rabbet. The rabbet on the poſt and ſtem may also be repreſented ; and the ſtations of the timbers aſſigned, as⊗, ( 1 ), 1, 2, 3, 4, 5, 6, 7, 9 ; and⊕, (A), A, B, C, D, E, F,

G, H ; and the ſheer plan will be completed.

The half-breadth plan is to be formed next ; for this purpoſe the perpendiculars TP, 9, 8, &c. muſt be pro­duced. Upon M⊕ produced ſet off the half breadth from the line KL to R (fig. 38.) ; ſet off alſo the half breadth at the tranſom from K to *b,* and deſcribe the extreme half breadth line *b* RX, making the fore­part of the curve agreeable to the propoſed round of the tranſom.

We may next proceed to form the timbers in the body plan. Let AB (fig. 39.) be the breadth mould­ed at ⊕. Erect the perpendicular CD in the middle of the line AB ; draw the line *m n* diſtant there­from the half thickneſs of the poſt, and *x y* the half thickneſs of the ſtern. Then take off the ſeveral por­tions of the perpendiculars®, 1, 2, &c. intercepted between the upper edge of the keel and the rising line in the ſheer plan, and ſet them up from C upon the line CD ; through theſe points draw lines paral­lel to AC ; take off alſo the ſeveral lower heights of breadth at⊗ , 1, 2, &c. from the sheer plan ; and ſet them up from C upon the middle line in the body plan; and draw lines parallel to AC through theſe points : Then take off the ſeveral half breadths correſponding to each from the floor plan ; and ſet them off on their proper half-breadth lines from the middle line in the body plan.

Conſtruct the midſhip frame by Problem V. the form of which will in ſome meaſure determine the form of the rest. For if a mould be made on any side of the middle line to fit the curve part of it, and the rising line, or that marked *bend mould* (fig. 40.), and laid in ſuch a manner that the lower part it, which is ſtraight, may be ſet upon the ſeveral rising lines, and the upper part juſt touch the point of the half breadth in the breadth line correſponding to that rifing upon which the mould is placed, a curve may then be drawn by the mould to the rising line. In this manner we may proceed ſo far as the rising line is parallel to the lower height oſ the breadth line. Then a hollow mould muſt be made, the upper end of which is left ſtraight, as