

## LIFE RAFT.

We give illustrations of a life raft, which received the first prize at the recent Tynemouth Naval Exhibition. It consists as will be seen, of two similar hulls, or tubular chambers, connected by a horizontal platform P along their whole length, and joined at the ends, as shown in the plan, Fig. 1. Along the top and bottom of each chamber is a strip K, which serves either as a keel or gunwale, according to which half of the boat, which is reversible, is above water. The hulls are made of 13 B. W. G. steel plates, provided with water-tight bulkheads B, as shown. The deck is open, and for a ship's boat is made of rope network, so that it can be launched without davits, and in any position, it being a matter of indifference which side comes uppermost in the sea. For special purposes, such as the Transport Service, the boat can be made to open in half, along the horizontal axis of the hulls, so as to form rafts for artillery or troops. As a life-boat, it was demonstrated during the Tynemouth Exhibition to be extremely efficient, not only being safe in very heavy weather, but easily handled, and travelling fast through the water. The inventors are Mr. A. Timmis, of 17 Great George-street, Westminster, and Mr. J. N. Hodgson, 19 Linnet-street, Poplar.—*Eng.*

## SMALL TURNTABLE.

The illustration shows a neat and good design for a small, light turntable up to 15 feet diameter. The revolving top is cast iron, with steel bush centre, and rails rivetted on; there are six wheels turning on spindles on outer frame.

## MANUFACTURE OF PORCELAIN AT THE ROYAL WORKS, DRESDEN.

These works are at Meissen, near Dresden. The china for ornamental pressing is not used in a clay state, but as a liquid, slip-like, thick cream. This is poured into the orifice of the mould left for the purpose, and then allowed to stand for a short time; when sufficient slip has adhered to the mould, the remainder is poured back into the casting jug. The slip having remained in the mould for some minutes becomes sufficiently solid to enable the workman to handle it. He next proceeds to arrange all the pieces on a slab of plaster before him. He then trims the superfluous clay from each, and applies some liquid slip to the parts, and so makes a perfect joint, each part being fitted to its proper place, until the whole figure is built up as it was before it was moulded; as each joint is made, the superfluous slip is removed with a camel's hair pencil.

The object is next propped with various strips of clay having exactly the same shrinkage and is then ready for the oven. The shrinkage or contraction to which we have alluded is one of the most important changes, as well as one of the greatest difficulties encountered in the art of pottery. The change will be more or less, according to the materials used and the process employed in making. Thus earthenware will not contract so much as porcelain, and a pressed piece will not contract so much as a cast one. The contractions are sufficiently well known to the modeler, and he makes allowance in the model accordingly, the design being fashioned so much larger than is actually required; the shrinkage from the original model to the finished object being sometimes equal to 25 per cent.

The ware up to this point in all the stages of manufacture we have described is most tender, and can only be handled with the greatest care.

The manufactured objects being now ready for baking, are taken to the placing house of the biscuit oven, where may be seen some hundreds of seggars of all shapes and sizes. These seggars, which are made of fire clay and are very strong, are the cases in which the ware is to be burned. Common brown wares, when the fire is comparatively easy, may be burned without any protection, as the fire or smoke cannot injure them; but for porcelain or white earthenware these cases are necessary. The seggars are made of various shapes to suit the different wares. Flat round ones are used for plates, each china plate requiring its own seggar and its own bed in it, made of ground flint very carefully prepared, for the china plate will take the exact form made in the bed of flint. Cups and bowls are placed, a number of them together, in oval seggars, ranged on china rings to keep them straight. These rings must be properly covered with flint to prevent them adhering to the ware burned upon them.

The seggars when full are piled one over the other most carefully in the oven, so as to allow the pressure to be equalized as much as possible; this is absolutely necessary, as when the oven is heated to a white heat (calculated as equal to about 25,000° Fah.) the least irregularity of bearing might cause a pile to topple on one side, and possibly affect the firing of the whole oven, causing a great amount of loss. Calcined flint is used for the purpose of making beds for the ware, because being pure silica it has no melting properties, and will not adhere to the china.

The form of oven seems to have been much the same in all ages, viz., that of a cone or a large beehive. A china oven is generally about 14 feet in diameter inside. It is built of fire-bricks, and is incased several times round with bands of iron to prevent too great expansion from the heat inside. There are generally eight fireplaces around the oven, with flues which lead directly into the oven in different directions. A china oven takes about forty hours to fire; it is then left to cool for about forty-eight hours. In order to test the burning, the fireman draws small test cups through holes in different parts of the oven made for the purpose. These tests show, both by contraction and the various degrees of translucency, the progress of the fire. The test holes are carefully stopped with bricks, so that cold air cannot be drawn into the oven.

The porcelain having been burnt is now in the state called biscuit; it is translucent and perfectly vitreous. Having had the flint rubbed off the surface and been carefully examined, it is sent into the dipping room.

The dipping room is supplied with large tubs of various glazes, suitable to the different kinds of ware. The glaze is really a kind of glass, which is chemically prepared of borax, lead, flint, etc., that when burned will adhere to the porcelains and will not craze or crackle on the surface. This glaze is ground very fine (being on the mill for about ten days) until it assumes the consistency of cream. The process of glazing is simple, but requires a practical hand, so that every piece may be equally glazed and the glaze itself equally distributed over the surface.

From the dipping room the ware is brought into the drying stove, where the glaze is dried on the ware. It is then taken by women into the trimming room, where any superfluous glaze is taken off, and defective places are made good. From this room it is taken to the glost oven placing house, where the greatest care and cleanliness are required, as should any dust or foreign substance get on the glaze it will adhere in the fire, and very likely spoil the piece.

The glost oven is of the same construction as the biscuit. It takes sixteen hours to fire, and the tests are made in the same manner as in the biscuit oven. The average heat is equal to about 11,000° Fah. In about thirty-six hours the oven will be sufficiently cool for the ware to be removed. It is then sent into the white warehouse, where it is sorted and given out to the painters and gilders, to be decorated according to the orders on the books.

Visitors generally look forward with pleasure to the mysteries of the decorating department. It is interesting to watch the painters, some on landscapes, others on birds or flowers or butterflies. All are interested in their work, which to the uninitiated may appear at first sight to be very unpromising, the colors being dull, and the drawing unfinished. As the work advances, it will be better understood. After the first "wash in" has been burned, and the painter has worked upon it for the second fire, the forms and finish, both in style and color, begin to appear.

The colors used are all made from metallic oxides; thus copper gives green and black; cobalt, blue; gold, purple; iron, red, etc.

The painters are trained from about fourteen years of age under special instructors; they thus acquire a facility of drawing and general manipulation of the colors which is found almost impossible to attain at a later period of life.

The gilding process is carried on in rooms adjacent to the painting. The elaborate and finely executed patterns in gold are all traced by the hand. The workmen require special training for this department also, correct drawing and clean finish being absolutely necessary. For the purpose of getting correct circles and speedy finish on circular pieces, a simple mechanical contrivance is used. A small table or stand with a revolving head receives the plate or saucer or cup, which is carefully centered so as to run truly. The time required for enamel kiln firing is about six hours.—*Pottery Gazette.*