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### Preparation of Lactic Acid.

Kiliani uses inverted sugar for making lactic acid. His method is as follows: 500 grammes of cane or beet sugar are dissolved in 250 grammes of water and 10 c. c. of dilute sulphuric acid added, and the sugar inverted by heating it to 50° C. (122° Fahr.) for three hours; neutralized with 400 c. c. soda solution (1 solid caustic soda to 1 water) added in portions of 50 c. c. each and cooled; warmed for a long time to 60° or 70° C. (140° to 158° Fahr.), until Fehling's solution is turned to faint green. Sulphuric acid (3 acid to 4 water) is run into the mixture when cold. After it cools again, a few crystals of Glauber salt are thrown in to make it crystallize. After 24 hours 33 p.c alcohol is poured over it, and the liquor exhausted with a filter pump. The alcoholic solution is put on a water bath and neutralized with carbonate of zinc, and after filtering is added to the other half. The lactate of zinc crystallizes out rapidly, and is purified by pressing or sucking out and recrystallizing. The yield is 37 or 40 per cent. of the weight of the sugar used. —*Chem. Zeit.*

### LIFE-SAVING APPARATUS AT THE RECENT NAVAL AND SUBMARINE EXHIBITION.

We give engravings (for which we are indebted to the *Engineer*) of a variety of life-saving apparatus, shown at the recent Naval and Submarine Exhibition, London, England. Figure 1 shows a "bridge life-boat," by John White, Me-

dina Dock, Cowes. This life-boat is held on the bridge athwart ship, which consists of a launching way pivoting horizontally at the center, so that either end can be tipped down to the gunwale on either side when the dog shores being struck, the lifeboat shoots into the water. Any water shipped is discharged through valves, and the boat is easily launched. The *Orontes* has long been fitted with this boat bridge, which has been so highly approved of that the system has been now adopted for the *Tamar* and *Himalaya*. This boat carries from 150 to 200 men. Filled with water she would support 100.

Fig. 2 is Roper's life raft, forming a captain's bridge. Its weight is given as 5¼ tons, floating power 80 tons. It is intended to be self-launching on its fastenings being released. Mr. Roper has also self-floating raft decks for river boats. These simply rest by their weight in their place. If a vessel settled down in smooth water they are designed to float off with the passengers. A model of the ill-fated *Princess Alice* is fitted with decks which are calculated to support  
(Continued on page 332.)

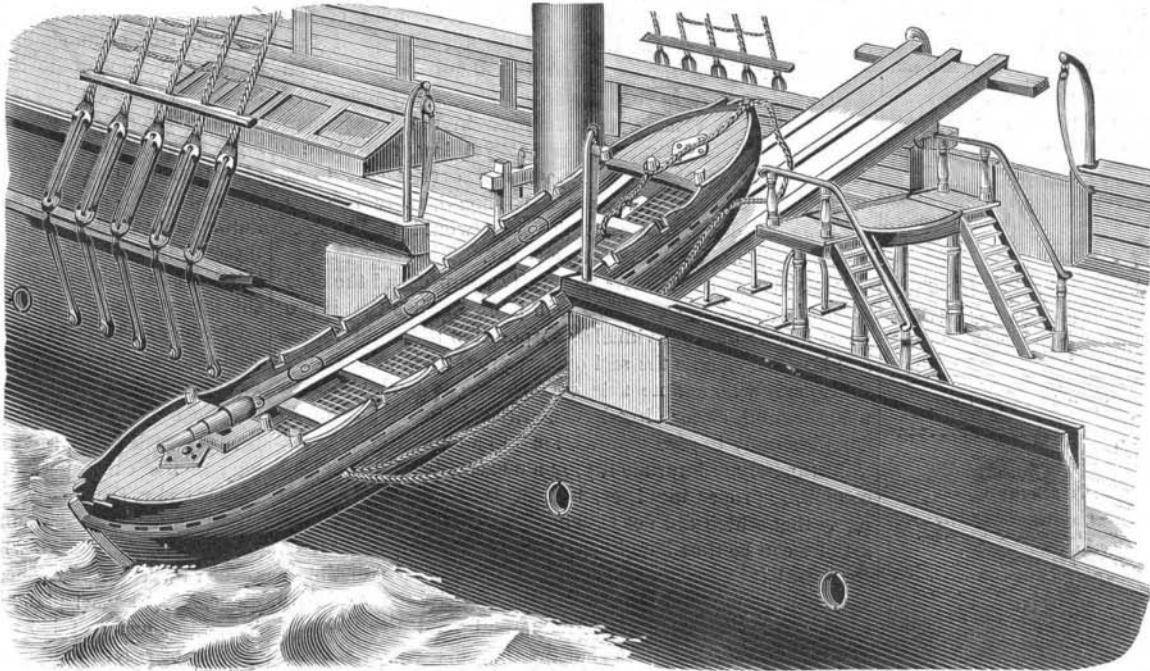
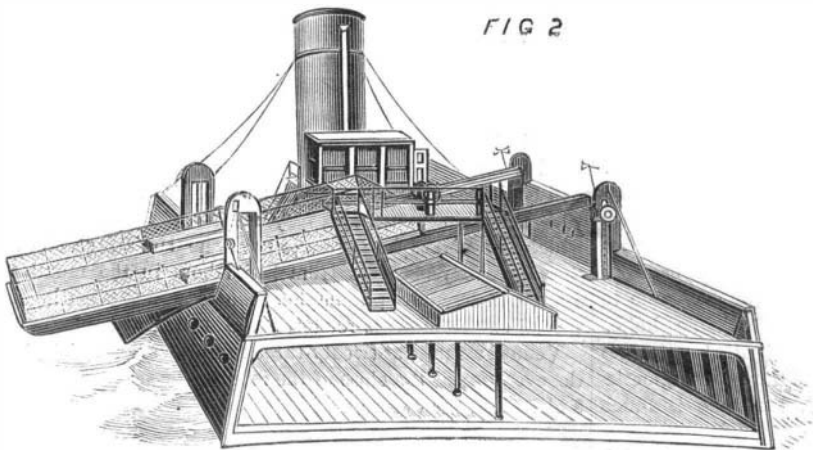
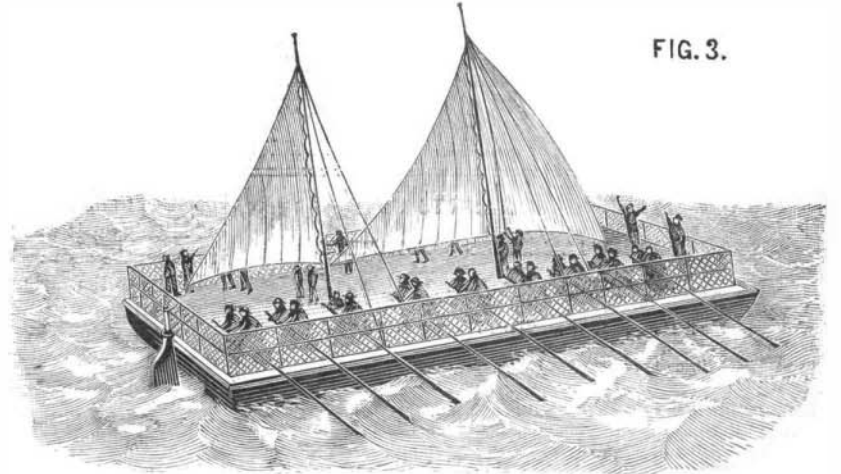


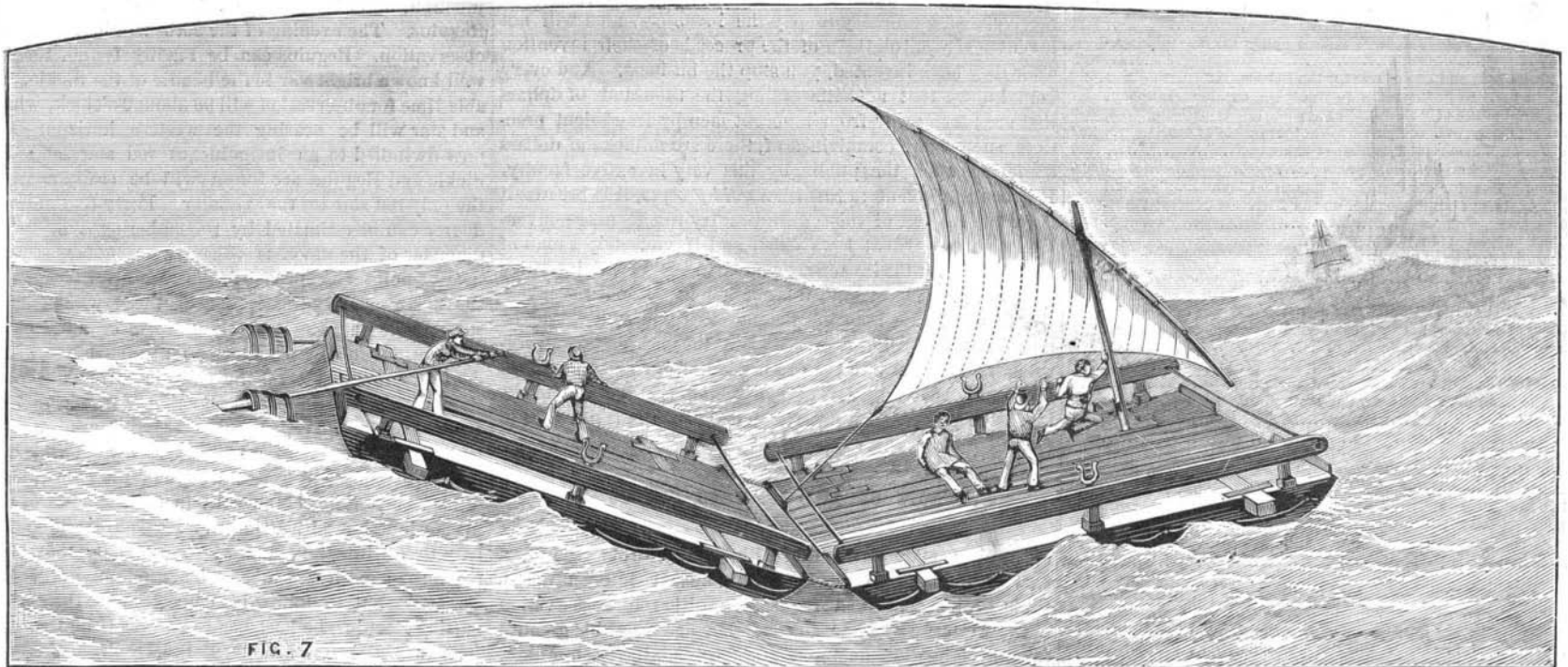
Fig. 1.—WHITE'S BRIDGE LIFE BOAT.



ROPER'S LIFE RAFT.



ROSE'S LIFE BUOY SEAT.



COPEMAN'S SEAT RAFT.

LIFE-SAVING APPLIANCES AT THE NAVAL AND SUBMARINE EXHIBITION, LONDON.