fitted with Diesel motors of 360 H.P. More recently the “ Emanuel Nobel ” and “ Karl Hagelin have been built for the same firm; they are fitted with Diesel motors of 1200 H.P., are 380 ft. long,

46 ft. beam, 16½ ft. draught and carry 4600 tons of kerosene oil. The large motor-driven vessels are arranged somewhat similarly to the steam-driven oil-tank vessels, but with the machinery fitted in a comparatively shorter space, no boiler room being then required.

Table X. gives the dimensions, carrying capacity and other leading particulars of four cargo steamers of different types,

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| --- | --- | --- | --- | --- | --- |
| Table X.—*Types of Cargo Carrying-Steamers.* | | | | | |
| When built . . . | A.  Builtin 1881. | B.  Built in 1894. | C.  Built in 1897. | D.  Built in 1909. | E.  Built in 1909. |
| Type of Vessel j | Well-  decked. | With Top-gallant Forecastle, Bridge House and Poop. | Awning-decked. | Shelter-decked. | American Lake Steamer. |
| Length  Breadth  Depth (moulded) í  Draught (without keel)  Weight of steel or iron in hull  „ wood, outfit, &c  „ propelling machinery ....  Total light displacement x  "Load displacement . . Λ'  „ block coefficient  Ratio of light to load displacement  Dead-weight carried . . .  Ratio of dead-weight carried to load displacement Cargo capacity in cubic feet..... Tonnage under deck ......  „ gross  „ net .  Water-ballast capacity | 263' 6\*  35?:  20' 6\*  19' 3\* 820 tons  166 „  184 „  1170 „ 3740 „  -72 '313  2570 tons •687  115,000  1436  1816  1167  357 tons | 300' 0\*  40' or  23z6\*  19' 2\*  1620 tons  5530 „  •80  •293  3910 tons •707  170,000  2150  2385  15∞  500 tons | 47°; °\*  50' 0\*  34z  27 5  3676 tons  509 „  615 ..  4800 „  16,710 „  •81  •287  11,91o tons •713  680,ooo  7038  7296  4770  3346 tons | 535' 0\*  63’0\*  38' 0\*  28' 0\*  1 7650 tons j  2200 tons 9850 ,∣  18,350 „  •68  •537  8500 tons •463  8480  12,100  6780 | 580' 0\*  58' 0\*  32' 0\*  19' or  4145 tons  3∞ »  350 „  4795 μ 15,795 «  •886  •304  1 1,000 tons •696  650,000  7100  7268  5484  9464 tons |

and one steamer carrying mails and passengers as well as a large cargo. A is a well-decked vessel (fig. 13, Plate II.), having a top- gallant forecastle with a long raised quarter-deck and bridge-house

combined, and is fitted with one deck, but has two tiers of beams. B (fig. 14, Plate II.) is a vessel with a top-gallant forecastle, bridge- house and poop, and a single deck. C is an awning-decked vessel

with two decks, but three tiers of beams. D is a shelter-decked vessel of the highest class fitted with three decks and four tiers of beams and having machinery of high pοwer. E is an American lake steamer in which the draught was limited to 20 ft., similar in many respects to the smaller vessels shown in fig. 15 (Plate II.) and in fig. 16 below. Besides the principal dimensions and light and load displacements,

the block “ coefficients ” corresponding to the load conditions are given in Table IV., in order to show the fullness of form commonly adopted in these vessels. The *block coefficient* is the ratio of the