

Fig. 3. A close-up view of the bows and the bridge superstructure.

liquids. In the tanker represented by the model the accommodation for officers and crew is above the engine room, and the whole length of the hull forward of these compartments is available for oil-carrying purposes, with the exception of a hold for dry cargo in the bows. The captain, radio operators and deck officers are housed in the bridge superstructure. The cargo oil carrying section of the hull is divided into rows of tanks, with cofferdams separating them from the dry cargo hold and from the fuel oil tanks at the stern.

As usual in Meccano ship design, this month's model is a waterline model, that is one in which only the section of the hull normally visible above the water is reproduced. For constructional purposes

the model can be divided into three convenient units, comprising the hull, the bridge superstructure and the stern superstructure. The sides of the hull and the deck are built up of Strip and Flexible Plates, braced on the inside by Angle Girders and Strips. A catwalk is fitted between the stern and the bridge superstructure, and deck fittings of various kinds, including derricks and oil pipes, are represented.

Full constructional details for building this fine model, and a list of the parts required, can be obtained by writing to the Editor, enclosing a 2d. stamp for postage. To avoid disappointment, and to help us in the distribution of the instructions, please write for your copy as soon as possible. A special supply will be reserved for Overseas readers.

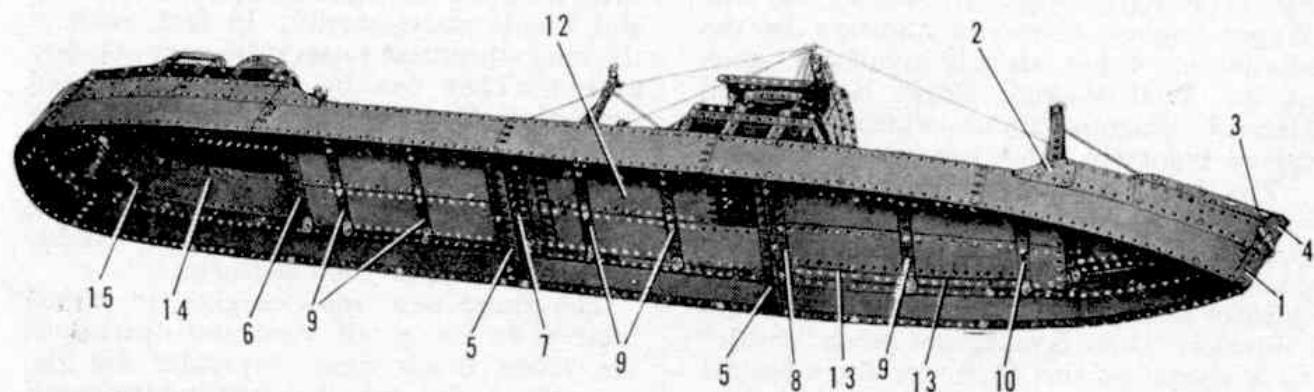


Fig. 4. The Oil Tanker seen from underneath. The general arrangement of the deck plates and the bracing members can be seen in this picture.

OIL TANKER

Illustrated in the December 1956 issue of the "Meccano Magazine"

Construction of the Hull

Each side of the hull is made by bolting together four  $12\frac{1}{2}$ " x  $2\frac{1}{2}$ " Strip Plates and a  $9\frac{1}{2}$ " x  $2\frac{1}{2}$ " Strip Plate as shown in Fig. 1. Two of the joins between these Plates are made by overlapping the Plates by two holes, and for the remaining two joins the Plates are overlapped three holes. The sides are connected at the bow by a  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flexible Plate 1 curved to U-shape, and at the stern by two curved  $4\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flexible Plates.

At the bow each side is extended upward by two  $5\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flexible Plates overlapped six holes, and by a  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Triangular Flexible Plate 2. These Plates are extended by a  $3\frac{1}{2}$ " x 2" Triangular Flexible Plate 3, a  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flexible Plate and a  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Triangular Flexible Plate. The Plates 3 are connected by a  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flexible Plate 4 curved to U-shape. At the stern the sides are extended upward by two  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Triangular Flexible Plates, and six  $5\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flexible Plates, two of which are curved to the shape of the rounded stern.

The lower edge of each side of the hull is strengthened by five  $12\frac{1}{2}$ " Strips, and the lower edges of the stern Plates are braced by curved  $4\frac{1}{2}$ " Strips. The upper edge of each side is strengthened by three  $12\frac{1}{2}$ " Strips.

The sides are connected by two  $7\frac{1}{2}$ " Angle Girders 5 attached by  $1$ " x  $\frac{1}{2}$ " Angle Brackets, and by three similar Girders 6, 7 and 8 bolted to  $\frac{1}{2}$ " x  $\frac{1}{2}$ " Angle Brackets. In addition a series of  $7\frac{1}{2}$ " Strips 9 is fixed to Angle Brackets bolted to the upper edges of the hull, and a made-up strip 10 is attached similarly. Strip 10 consists of two  $4\frac{1}{2}$ " Strips overlapped five holes.

The Decks and Deck Fittings

The foredeck consists of a number of Plates bolted between a triangle of made-up strips. The two longer sides of this triangle are each formed by a 3" and two  $3\frac{1}{2}$ " Strips and the shorter side is made from two  $4\frac{1}{2}$ " Strips overlapped five holes. The space between the Strips is plated by a  $5\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flat Plate, two  $5\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flexible Plates and two  $3\frac{1}{2}$ " x  $1\frac{1}{2}$ " Triangular Flexible Plates. The assembly is connected to the sides of the hull by Angle Brackets. Two 3" Flat Girders 11 are attached to the rear edge of the foredeck by Angle Brackets. A winch on this deck is represented by  $\frac{1}{2}$ " Pinions on a  $2\frac{1}{2}$ " Rod supported in a  $1\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip, which is spaced from the deck by Washers on  $\frac{5}{8}$ " Bolts. A hatch cover is formed by a 1 11/16" radius Curved Plate edged by  $2\frac{1}{2}$ " Strips and Formed Slotted Strips, and this also is spaced from the deck by Washers on long Bolts.

A  $3\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip is bolted to the Flat Girders 11 and to each lug of the Double Angle Strip two face to face  $5\frac{1}{2}$ " Strips are fixed, with a  $5\frac{1}{2}$ " Curved Strip between them. These Strips are connected at their upper ends by a further  $3\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip that supports two  $4\frac{1}{2}$ " Angle Girders. To each pair of Strips a Rod and Strip Connector is attached, and  $3\frac{1}{2}$ " Rods in these represent the derricks.

The main deck is plated by eight  $12\frac{1}{2}$ " x  $2\frac{1}{2}$ " Strip Plates and

a  $9\frac{1}{2}$ " x  $2\frac{1}{2}$ " Strip Plate 12, bolted to the Angle Girders 6, 7 and 8 and to the Strips 9 and 10. Two  $5\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flexible Plates 13 are arranged on each side towards the bow.

The deck at the stern consists of a  $9\frac{1}{2}$ " x  $2\frac{1}{2}$ " Strip Plate 14 on each side and a 6" Circular Plate. The Strip Plates are supported by a  $7\frac{1}{2}$ " Angle Girder bolted to the Girder 6, and by two 1" x  $\frac{1}{2}$ " Angle Brackets, one of which is indicated at 15. The Circular Plate is bolted to the Strip Plates and is clamped between them and the lugs of the Angle Brackets.

Nine  $6\frac{1}{2}$ " Rods are attached across the deck as shown by two Right Angle Rod and Strip Connectors each. The Rods 16 and 17 also are held at each end in pairs of Right Angle Rod and Strip Connectors. These are attached to the deck by  $\frac{1}{2}$ " Bolts, but are spaced from the deck and from each other by Washers on the Bolts. Rods 16 are  $6\frac{1}{2}$ " long and Rods 17 are made from  $11\frac{1}{2}$ " and  $1\frac{1}{2}$ " Rods joined by Rod Connectors.

The derrick supports 18 are pairs of  $5\frac{1}{2}$ " Strips and a  $5\frac{1}{2}$ " Curved Strip, and each is attached to the deck by a 1" x 1" Angle Bracket. The derricks are made from Rod and Strip Connectors and  $3\frac{1}{2}$ " Rods as described previously.

#### Assembly of the Bridge Structure

The complete bridge structure should be built as a unit and attached to the hull when completed. The lower part of each side is a  $5\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flat Plate, and this is extended upward by a  $4\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flat Plate 19. A  $4\frac{1}{2}$ " Angle Girder 20 is attached to Plate 19 by a Fishplate and is bolted to the upper end of a  $2\frac{1}{2}$ " Angle Girder 21. A  $4\frac{1}{2}$ " Strip is fixed between the Girder 20 and a 1" Corner Bracket 22. The sides are connected at the rear by a  $4\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flat Plate bolted to  $2\frac{1}{2}$ " Angle Girders, and at the front by two  $4\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flexible Plates arranged vertically and attached to the sides by Angle Brackets. A  $4\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flat Plate 23 is bolted to the Girders 21 and its upper edge is fitted with a  $4\frac{1}{2}$ " Angle Girder. The roof of the bridge is formed by two  $4\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flat Plates bolted to this Girder and to the Girders 20. A  $4\frac{1}{2}$ " Flat Girder 24 is attached to Angle Brackets.

The rounded front of the bridge is made by bolting two vertical  $5\frac{1}{2}$ " Strips to Angle Brackets fixed to the Corner Brackets 22. These Strips support a  $9\frac{1}{2}$ " Strip 25 and a  $7\frac{1}{2}$ " Strip 26, and four  $4\frac{1}{2}$ " Strips are bolted between the vertical  $5\frac{1}{2}$ " Strips as shown. A vertical  $5\frac{1}{2}$ " Strip 27, a  $2\frac{1}{2}$ " Flat Girder, two  $1\frac{1}{2}$ " Strips, two  $2\frac{1}{2}$ " Strips 28 and two  $2\frac{1}{2}$ " Stepped Curved Strips complete the front of the bridge. Two  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Triangular Flexible Plates attached to the upper end of Strip 27 by an Angle Bracket fill in the front of the roof of the bridge.

A platform 29 on each side is formed by a  $5\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flexible Plate bolted to a  $1\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip 30. The Flexible Plate is edged by a  $5\frac{1}{2}$ " Strip, and three  $2\frac{1}{2}$ " Strips 31 and a  $2\frac{1}{2}$ " Curved Strip are attached to it, two 1" x  $\frac{1}{2}$ " Angle Brackets and the outer lug of Double Angle Strip 30 being used for this purpose. Strips 31 support a  $5\frac{1}{2}$ " Strip and this is connected to Strips 26 by a 1" x  $\frac{1}{2}$ " Angle Bracket. A  $5\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flexible Plate is attached to the  $5\frac{1}{2}$ " Strip by Angle Brackets. Each lifeboat is made from two  $2\frac{1}{2}$ " Strips and a  $2\frac{1}{2}$ " Curved Strip, and it is attached by Angle Brackets to  $1\frac{1}{2}$ " Strips, which are fixed to Angle Brackets bolted to the platform 29.

A platform 32 is made from a  $4\frac{1}{2}$ " Flat Girder supported by a 1" Reversed Angle Bracket and by a  $2\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip 33. A  $4\frac{1}{2}$ " Strip is attached to the edge of the platform by an Angle Bracket and the lug of the Reversed Angle Bracket, and a 1" x  $\frac{1}{2}$ " Angle Bracket is fixed to the outer lug of the Double Angle Strip 33.

The mast is a  $6\frac{1}{2}$ " Rod fixed in a Double Arm Crank bolted to the roof of the bridge. Two  $3\frac{1}{2}$ " x  $1\frac{1}{2}$ " Triangular Flexible Plates are curved as shown and are fixed by bolts screwed into two Collars on the mast.

The complete structure is attached to the hull by bolting in place the Strips 31.

### The Stern Superstructure

This section also can be built as a unit and fitted in place when completed. The sides of the central structure are each formed by two  $5\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flexible Plates edged at the top by a  $9\frac{1}{2}$ " Angle Girder and at the bottom by a  $9\frac{1}{2}$ " Strip. The sides are connected at each end by a  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flanged Plate. Each side of the boat deck consists of a  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Triangular Flexible Plate 34, a  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flexible Plate, a  $4\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flexible Plate, a  $2\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flexible Plate and a  $4\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flexible Plate 35. These Plates are fixed to the  $9\frac{1}{2}$ " Angle Girder and they are edged on the outside by a  $2\frac{1}{2}$ " and two  $4\frac{1}{2}$ " Strips. Six  $1\frac{1}{2}$ " Strips and a  $2\frac{1}{2}$ " Curved Strip are attached to the outer edges of the Plates by Angle Brackets. The rear ends of the Plates 35 are connected by a  $5\frac{1}{2}$ " Strip and a  $5\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flexible Plate, and these support a  $2\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flexible Plate 36.

Two  $9\frac{1}{2}$ " Flat Girders are connected at the front by a  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Double Angle Strip and a similar Double Angle Strip 37 is attached to  $1\frac{1}{2}$ " Strips bolted vertically to the Flat Girders. A  $4\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flexible Plate is bolted to a  $2\frac{1}{2}$ " Angle Girder fixed to Double Angle Strip 37, and to a  $5\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flat Plate 38 attached to  $7\frac{1}{2}$ " Angle Girders bolted to the  $9\frac{1}{2}$ " Flat Girders. A  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Double Angle Strip 39 is fixed between the rear ends of the  $9\frac{1}{2}$ " Flat Girders and is used to attach them to the boat deck. The lifeboats are made in the same way as those described previously.

Two vertical  $3\frac{1}{2}$ " Strips 40 are bolted to Double Angle Strip 37 and to them are fixed three  $7\frac{1}{2}$ " Strips indicated at 41. Two of these Strips are fitted with  $1$ " x  $1\frac{1}{2}$ " Angle Brackets, and these are bolted to the sides of the hull and to  $1$ " Corner Brackets fixed to the sides. The  $1\frac{1}{2}$ " Strips connected to the boat deck also are attached to the hull and serve to fix the stern superstructure in place.

The funnel is made from two curved  $3\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flexible Plates, a  $1\frac{11}{16}$ " radius Curved Plate and two  $3\frac{1}{2}$ " x  $1\frac{1}{2}$ " Triangular Flexible Plates. It is attached to Flat Plate 38 by Angle Brackets. The ventilators are Collars fixed on Threaded Pins.

The catwalk between the bridge and the stern superstructure consists of two  $18\frac{1}{2}$ " Angle Girders connected by four  $5\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flexible Plates. It is connected to the bridge and to one of the Strips 41 by  $1\frac{1}{2}$ " Angle Girders. A  $2\frac{1}{2}$ " Angle Girder bolted to the catwalk supports a Girder Bracket 42 on each side.

The model is completed by adding Cord for rigging, and anchors made from  $1$ " Rods and  $\frac{3}{8}$ " Bolts held in the "spiders" from Swivel Bearings. The "spiders" are screwed on to bolts passed through the sides of the hull.

Parts Required: 16 of No. 1; 3 of No. 1a; 11 of No. 1b; 18 of No. 2; 29 of No. 2a; 8 of No. 3; 2 of No. 4; 23 of No. 5; 24 of No. 6a; 2 of No. 7a; 2 of No. 8a; 8 of No. 8b; 5 of No. 9a; 6 of No. 9d; 2 of No. 9f; 2 of No. 10; 52 of No. 12; 2 of No. 12a; 30 of No. 12b; 4 of No. 13; 14 of No. 13a; 6 of No. 16; 1 of No. 16a; 2 of No. 26; 496 of No. 37a; 475 of No. 37b; 78 of No. 38; 1 of No. 40; 3 of No. 48; 6 of No. 48a; 2 of No. 48b; 2 of No. 51; 6 of No. 53a; 8 of No. 59; 1 of No. 62b; 4 of No. 7D; 4 of No. 89; 8 of No. 90; 2 of No. 90a; 2 of No. 103a; 3 of No. 103d; 2 of No. 103e; 1 of No. 103f; 8 of No. 111a; 10 of No. 111c; 6 of No. 115; 2 of No. 124; 4 of No. 125; 4 of No. 133a; 1 of No. 146; 2 of No. 161; 2 of No. 165; 12 of No. 176; 6 of No. 188; 25 of No. 189; 3 of No. 190; 2 of No. 190a; 9 of No. 191; 5 of No. 196; 16 of No. 197; 2 of No. 200; 6 of No. 212; 34 of No. 212a; 4 of No. 215; 8 of No. 221; 6 of No. 224; 2 of No. 225.