MECCANO
Cargo Ship

(MODEL No. 10.4)

SPECIAL FEATURES

This fine model reproduces the main external features of a typical high-capacity cargo vessel. It has a raked stem, streamlined funnel, and three cargo holds. The ship is over 7 ft. in length and has a beam of 13 in. approximately.

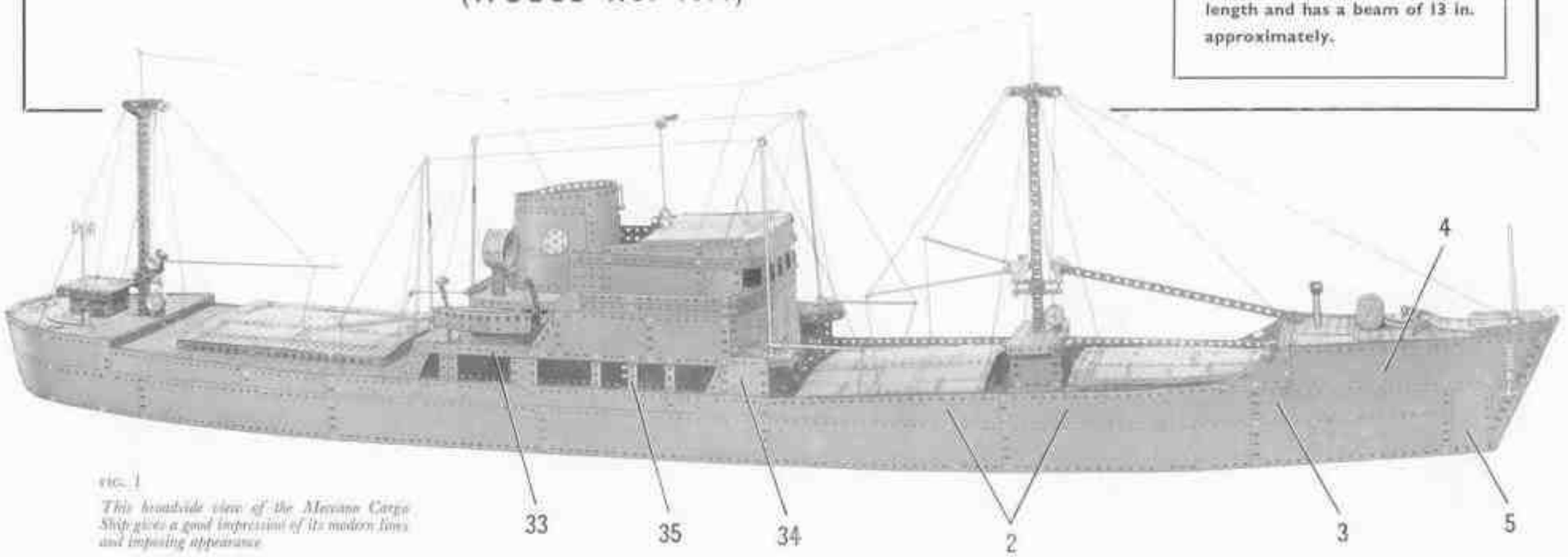


FIG. 1

This broadside view of the Meccano Cargo Ship gives a good impression of its modern lines and imposing appearance

The attractive cargo ship illustrated and described in this Leaflet contains many features of interest for ship-lovers, and its construction presents no difficulties even to an inexperienced model-builder. When completed the ship has a most realistic and imposing appearance as it is nearly 7 ft. 6 in. long and has a beam of 13 in.

Constructional Details: The Hull (Figs. 1, 3, 4 and 5)

The lower section of the plating on each side of the hull consists of a 9½" × 2½" Strip Plate and six 12½" × 2½" Strip Plates bolted together. These Plates are strengthened along their lower edges by 12½" Strips at the bow and the stern, and by a 24½" Angle Girder (1) (Fig. 5) amidships. The Strip Plates amidships are extended upward by six 3½" × 1½" Flexible Plates, and towards the bow two 12½" × 2½" Strip Plates (2) are fixed at a slight angle (Fig. 1), and are extended forward by a 9½" × 2½" Strip Plate (3). A further 12½" × 2½" Strip Plate (4) and a 3½" × 2" Triangular Flexible Plate are fixed to the Plates 2 and 3 as shown. A 5½" × 2½" Flexible Plate (5) is bolted vertically to the front ends of the 9½" × 2½" Strip Plates.

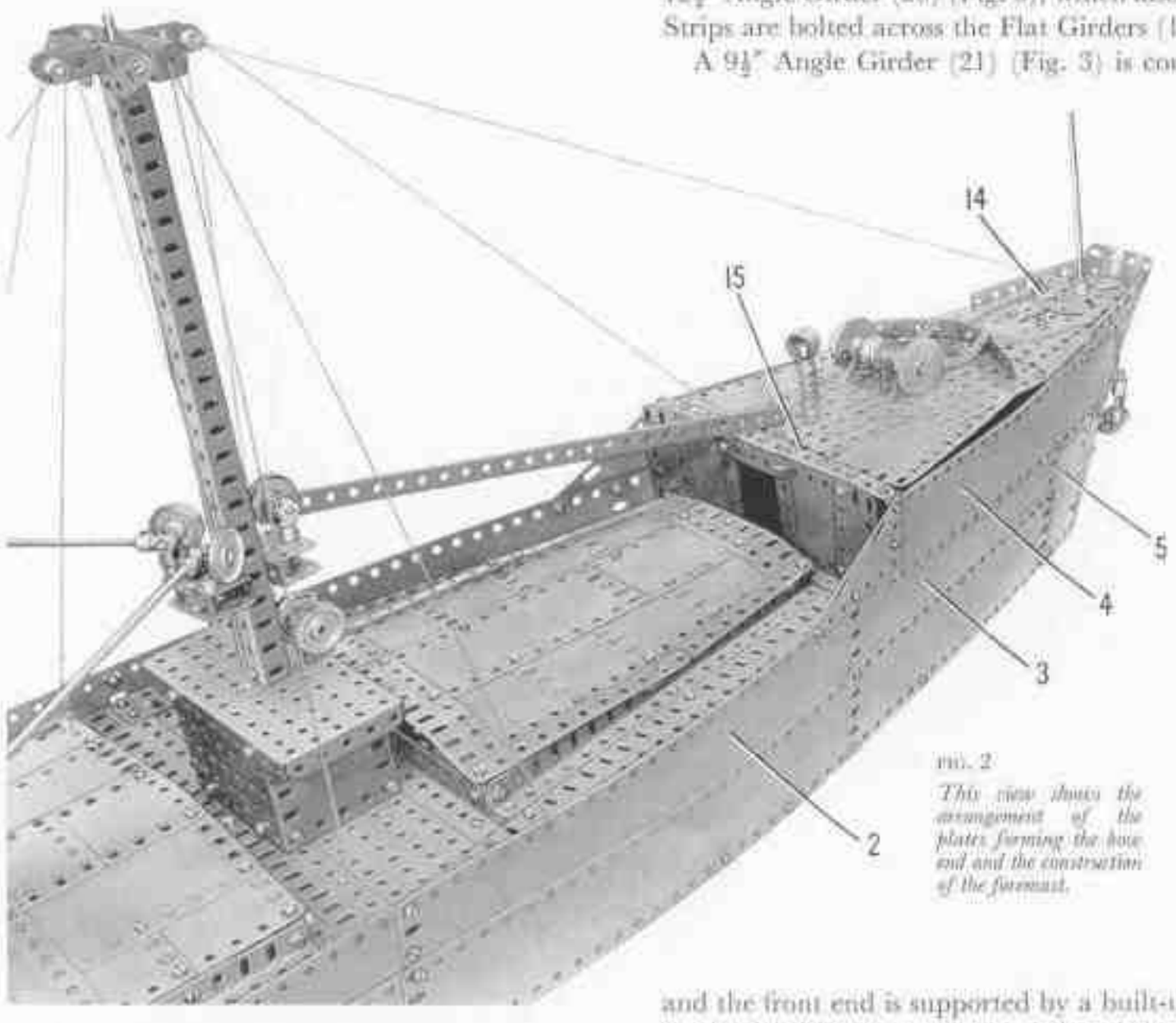
The Strip Plates at the stern are curved, and are connected by a 3½" × 2½" Flexible Plate, whose lower edge is strengthened on the inside by a Formed Slotted Strip. The stern Plates are extended upward by a 12½" × 2½" Strip Plate (6) (Fig. 7) and two 5½" × 2½" Flexible Plates on each side, and a further 5½" × 2½" Flexible Plate is bolted in position above the 3½" × 2½" Flexible Plate.

The sides of the hull are connected by two 12½" Angle Girders (7) and (8) (Fig. 5) and by similar Girders (9) and (10) bolted to the ends of 18½" Angle Girders (11). Two 18½" Angle Girders fixed to the Girders (1) and (8) are supported at their rear ends by a 9½" Angle Girder (12), which is attached to the sides of the hull by Angle Brackets. Two 24½" Angle Girders are bolted to the Girders (1) and (7), and to a 9½" Angle Girder (13) that is connected to the hull by Angle Brackets.

The prow is formed by three U-section Curved Plates and a curved 2½" × 1½" Flexible Plate bolted to the Plates forming the sides of the hull. The gaps between the U-section Curved Plates and the Plates (5) are filled in by 3½" × 1½" Triangular Flexible Plates.

Assembly of the Decks

The foredeck consists of a Face Plate (14) (Fig. 2) at the bows bolted to two Flanged Sector Plates. Behind the Flanged Sector Plates are two 5½" × 3½" Flat Plates, with a 3½" × 2½" Flexible Plate on each side arranged at an angle. The aft ends of these Plates are supported by a made-up strip (15), consisting of a 5½" and a 3½" Strip, which is attached to the top lugs of 2½" × ½" Double Angle Strips bolted to the sides. The lower lugs of these Double Angle Strips support a strip (16) (Fig. 3) made from a 5½" and a 2½" Strip. A 2½" × 2½" and a 2½" × 1½" Flexible Plate on each side are bolted together and are connected vertically to the strips (15) and (16) by Angle Brackets. They are bolted also to 2½" × ½" Double Angle Strips fixed between these strips.



No. 2
This view shows the arrangement of the plates forming the bow end and the construction of the foremast.

A 7½" Strip (17), with a 5½" Angle Girder bolted centrally to it, is attached to the strip (16) by two Fishplates. A 12½" Flat Girder (18) on each side is supported by the Strip (17), and its rear end is joined by a 2" Flat Girder to a further 12½" Flat Girder (19). The front end of the latter part is connected to the side of the hull by an Angle Bracket, and the rear end is supported by a 12½" Angle Girder (20) (Fig. 5), which also is fixed to Angle Brackets. Two 12½" Strips are bolted across the Flat Girders (19) in front of the Angle Girder (20).

A 9½" Angle Girder (21) (Fig. 3) is connected to each Flat Girder (18) by three Fishplates, and 3½" × ½" Double Angle Strips are bolted between these Flat Girders and the Angle Girder (13).

A 9½" Flat Girder (22), extended by a 2½" Flat Girder, is fixed to the Flat Girders (19), and two 5½" Strips (23) joined together are also attached to the Flat Girders (19). A 9½" Flat Girder (24) is connected to the Flat Girders (18) by a 1½" Strip at each end. Two 4½" × 2½" Flat Plates are placed between the Flat Girders (22) and (24) as shown in Fig. 3.

The deck at the stern consists of two 5½" × 2½" Flat Plates (25) (Fig. 7), a 6" Circular Plate and a 4" Circular Plate bolted to a 9½" Strip (26) (Fig. 4). A 3½" × 2½" Flanged Plate and a 4½" × 2½" Flexible Plate are fixed at each side, and the deck is edged by Curved Strips as shown. The rear end of Strip (26) is connected to the stern by an Angle Bracket, and the front end is supported by a built-up girder made from a 7½" and a 4½" Angle Girder bolted together. This girder is connected to the sides of the hull by 1" × 1" Angle Brackets, and two 18½" Angle Girders (27) (Fig. 4) are attached to it by Double Brackets. The front ends of the Girders (27) are joined to the Girder (10) by 1½" Strips. Two 12½" Strips are fixed to the Girders (27) behind the Girder (10). A 12½" Strip (28) on each side, extended by a 5½" Strip, is supported by one of the first-mentioned 12½" Strips and is connected to the

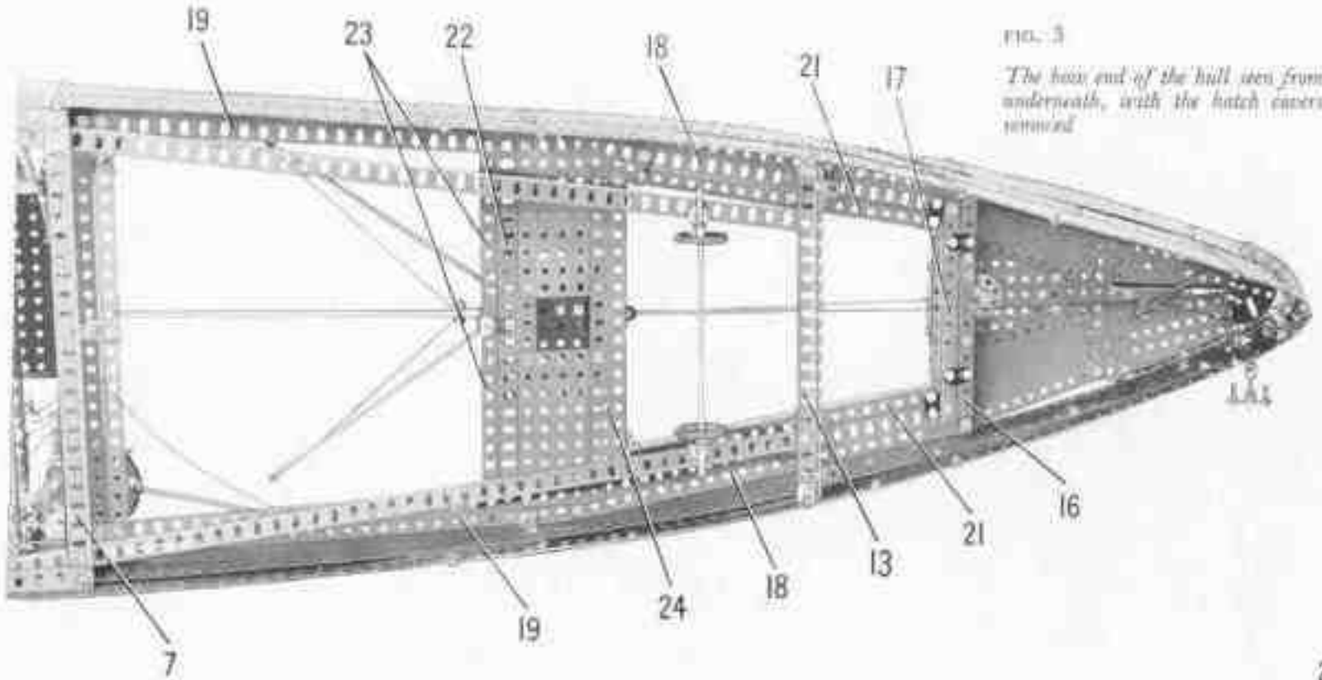


FIG. 3

The bow end of the hull seen from underneath, with the hatch covers removed

Girder (27) by Fishplates. A strip (29) on each side, made from a $5\frac{1}{2}$" and a $4\frac{1}{2}$" Strip, is bolted to a $5\frac{1}{2}$" Angle Girder that is fixed to the side of the hull by bolts (30) (Fig. 7).

Two $5\frac{1}{2}$" × $3\frac{1}{2}$" Flat Plates, edged by a girder 31 (Fig. 4), are fixed to the rear ends of the Girders (27). The girder (31) is made from a $5\frac{1}{2}$" and a $4\frac{1}{2}$" Angle Girder, and it is connected to a $12\frac{1}{2}$" Angle Girder on each side by a 1" × 1" Angle Bracket. The $12\frac{1}{2}$" Angle Girders are fixed to the Girders (27), and they are joined by 1" × 1" Angle Brackets at their front ends to a built-up girder (32), which is made in the same way as the girder (31).

The Superstructure

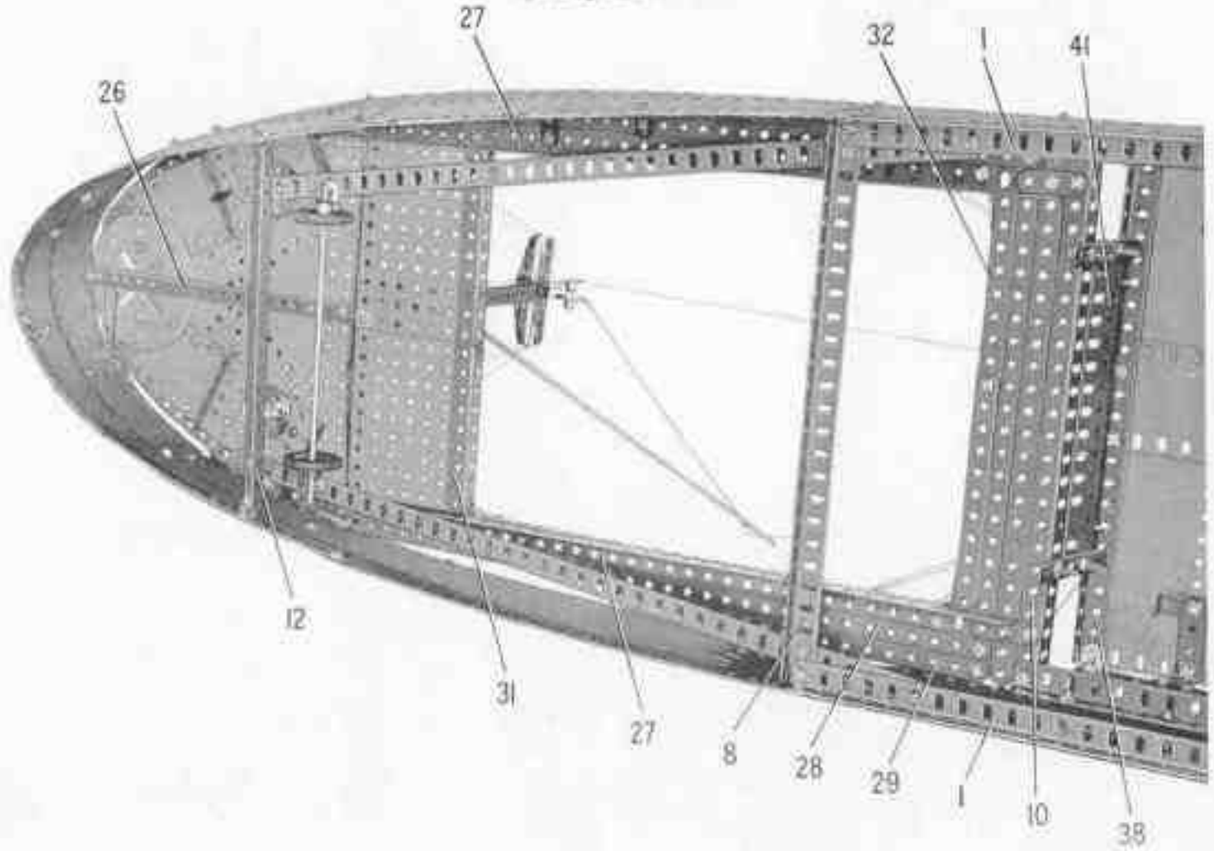
A strip (33) (Fig. 1) on each side is made up from a $12\frac{1}{2}$" and a $7\frac{1}{2}$" Strip. It is then bolted to a $2\frac{1}{2}$" × $2\frac{1}{2}$" Flexible Plate (34), edged at the front by a 3" Strip and at the rear by a $2\frac{1}{2}$" × $1\frac{1}{2}$" Triangular Flexible Plate. It is also bolted to two $2\frac{1}{2}$" Strips and a $5\frac{1}{2}$" Strip (35), to a $2\frac{1}{2}$" × $1\frac{1}{2}$" Flexible Plate, to two $2\frac{1}{2}$" Strips placed together and to two 3" Strips arranged at a slight angle (Fig. 1).

A $4\frac{1}{2}$" × $2\frac{1}{2}$" Flexible Plate, a $5\frac{1}{2}$" × $2\frac{1}{2}$" Flexible Plate, and a $2\frac{1}{2}$" × 2" Triangular Flexible Plate are fixed to each of the strips (33).

The top edges of these Plates are strengthened by two $5\frac{1}{2}$" Strips, and the front edge of the $4\frac{1}{2}$" × $2\frac{1}{2}$" Flexible Plate is braced by a vertical $7\frac{1}{2}$" Strip (36) (Fig. 5). A $5\frac{1}{2}$" × $2\frac{1}{2}$" and a $4\frac{1}{2}$" × $2\frac{1}{2}$" Flat Plate on each side are attached by Angle Brackets to the strips (33). The Flat Plates are connected across by two $9\frac{1}{2}$" Strips, two $4\frac{1}{2}$" × $2\frac{1}{2}$" Flexible Plates, and a built-up girder (37) made from a $7\frac{1}{2}$" and a $5\frac{1}{2}$" Angle Girder overlapped two holes. The rails on each side are $5\frac{1}{2}$" and $3\frac{1}{2}$" Strips bolted to the top ends of the Strips (35) and (36) and to a Semi-Circular Plate at the rear.

FIG. 4

An underneath view showing details of the plates that form the rounded end of the aft deck



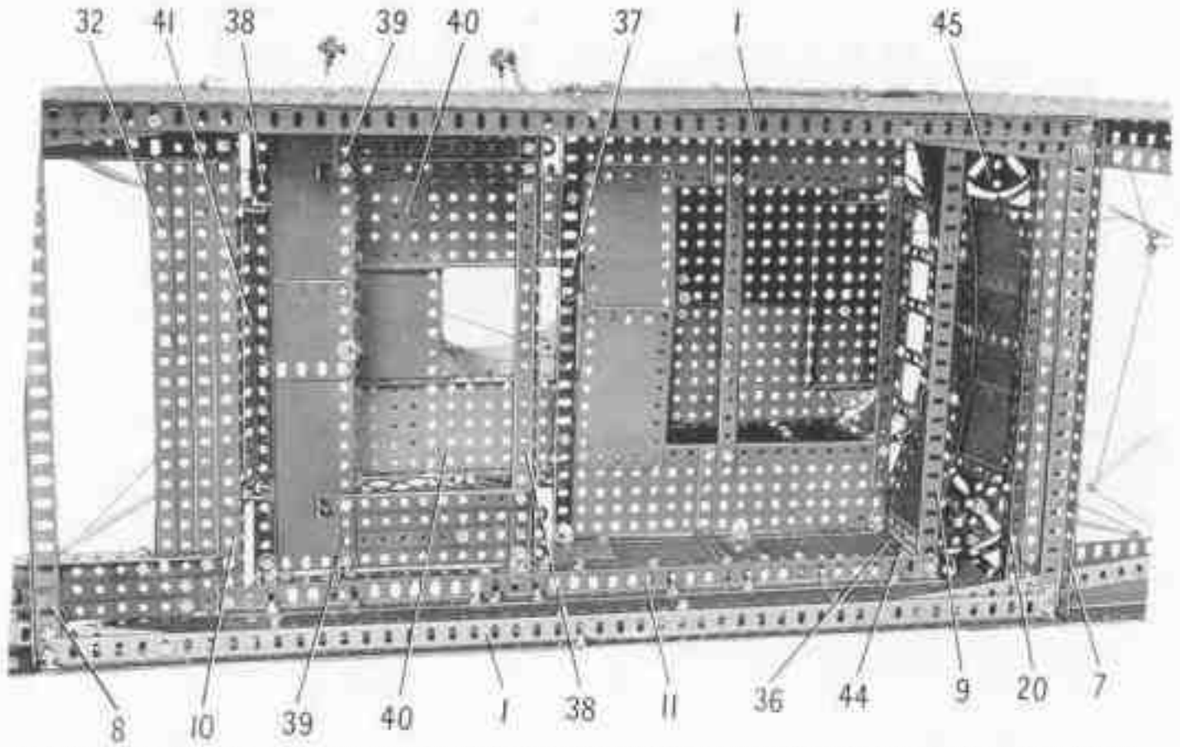


FIG. 5 *This view shows the superstructure as seen from inside the hull, and the bracing girders that strengthen the hull amidships*

Two built-up girders (38), each made from a $7\frac{1}{2}$" and a $5\frac{1}{2}$" Angle Girder, are attached to the strips (33) by Angle Brackets. Two $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates separated by a $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate are bolted to the rear girder (38), and the $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate on each side is connected to the front girder (38) by two $5\frac{1}{2}"$ Strips, a $5\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip and a built-up $5\frac{1}{2}"$ strip. The built-up strip is made from a $3\frac{1}{2}"$ and a 2" Strip, and the rear ends of the Strips are supported by a 2" Strip (39) that is connected to the strip (33) by a Corner Angle Bracket.

A $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate (40) on each side is bolted to the girder (37) and these are connected at their rear ends by *one half of a Hinged Flat Plate* (Fig. 5). A $5\frac{1}{2}"$ Braced Girder is fixed to the outer flange of each Flanged Plate, and two $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates overlapped two holes are bolted to the rear flanges. The lower edges of the Flexible Plates are strengthened by two $4\frac{1}{2}"$ Strips. A $7\frac{1}{2}"$ Flat Girder (41) is bolted to two $2\frac{1}{2}"$ Strips that are fixed to the Angle Girder (10).

The front of the superstructure is filled in by two vertical $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates at the centre, and a $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate (42) and a $3\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate (43) on each side (Fig. 8). A $5\frac{1}{2}"$ Strip (44) is bolted to the outer edge of each of the Plates (42), and a $3\frac{1}{2}"$ Strip is fixed to the outer edge of each Plate (43). The Plates are edged at the front by two $12\frac{1}{2}"$ Strips as seen in Fig. 8, and on the inside by a $12\frac{1}{2}"$ Strip placed one hole below the lower edges of the Plates (42) and bolted to the Strips (44).

The Strips (44) are connected to the Strips (36) by Obtuse Angle Brackets, and the Plates (43) are attached to the Girder (20) by an Angle Bracket at the centre and a Fishplate at each end. A Face Plate (45), fitted with a $1\frac{1}{2}"$ Corner Bracket, is connected by an Angle Bracket to each of the Plates (34), and Formed Slotted Strips attached to the Face Plate by Angle Brackets are connected to the Plates (43) by $1" \times \frac{1}{2}"$ Angle Brackets.

Details of the Bridge

The front of the bridge consists of two $3" \times 1\frac{1}{2}"$ Flat Plates bolted to a $5\frac{1}{2}"$ Strip that is attached to window frames formed by four 2" Strips and a $5\frac{1}{2}"$ Strip. Each rounded corner is formed by two Formed Slotted Strips and a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate. Each side consists of two $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates, two $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates, and a $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flat Plate, which are bolted together so that the upper edge slopes aft slightly. The sides are connected by Angle Brackets to the girder (37), and a $5\frac{1}{2}"$ Angle Girder is fixed to the top edge of each side. The roof consists of two $5\frac{1}{2}" \times 3\frac{1}{2}"$

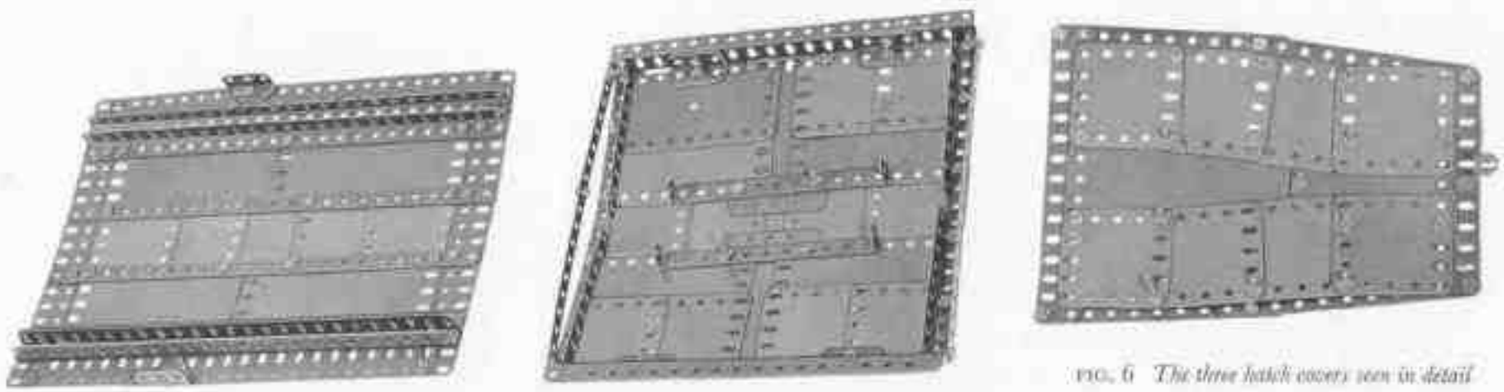


FIG. 6 *The three hatch covers seen in detail*

Flat Plates, a 5½" ×2½" Flanged Plate (46) (Fig. 8), and two Wheel Discs. The back is filled in by a 3½" ×2½" Flanged Plate bolted to each side and connected at the centre by a 2½" ×2½" Flexible Plate. A 7½" Flat Girder is attached to the roof and to the back by Obtuse Angle Brackets.

The direction-finding aerial is a loop of Spring Cord in a Handrail Support fixed to the roof. The radar aerial is formed by six 3" Stepped Curved Strips spaced by Washers on ⅜" Bolts and clamped between Collars on a 6½" Rod. This Rod is fitted with a ½" Pulley and a Socket Coupling, and is fixed in a Double Arm Crank bolted underneath the roof of the bridge.

The Masts and Funnel

Two 3½" × 2½" Flanged Plates are connected at their ends by 2½" ×2½" Flexible Plates and are bolted to a 5½" ×2½" Flanged Plate (47) (Fig. 8). This structure is attached to the deck by Angle Brackets. The foremast is formed by two 12½" Angle Girders bolted to Angle Brackets fixed to the Flanged Plate (47). The top ends of the Girders are bolted to the lugs of a large Fork Piece, which is placed with its boss downward, and supports a 6½" Rod. To each Angle Girder is fixed a Channel Bearing (48). Two 3½" Strips and four 1½" Strips connected by Double Brackets are fixed to the top of the Angle Girders, and a Stepped Bent Strip (49) and a Single Bent Strip (50) are attached to them (Fig. 8).

The front of the funnel consists of two vertical 5½" ×2½" Flexible Plates, and each side is formed by two horizontal 5½" ×2½" Flexible Plates. Two 1 11/16" radius Curved Plates are used for the rear end. The sloping upper edges consist of two 3½" ×2½" Triangular Flexible Plates and three 2½" ×1½" Flexible Plates. The funnel is attached to the Flanged Plates (40) by Angle Brackets.

The aft mast (Fig. 7), is generally similar to the foremast, but varies in slight details that can be seen in the illustration. Two Trunnions (51) and a 1½" Angle Girder are bolted to the mast.

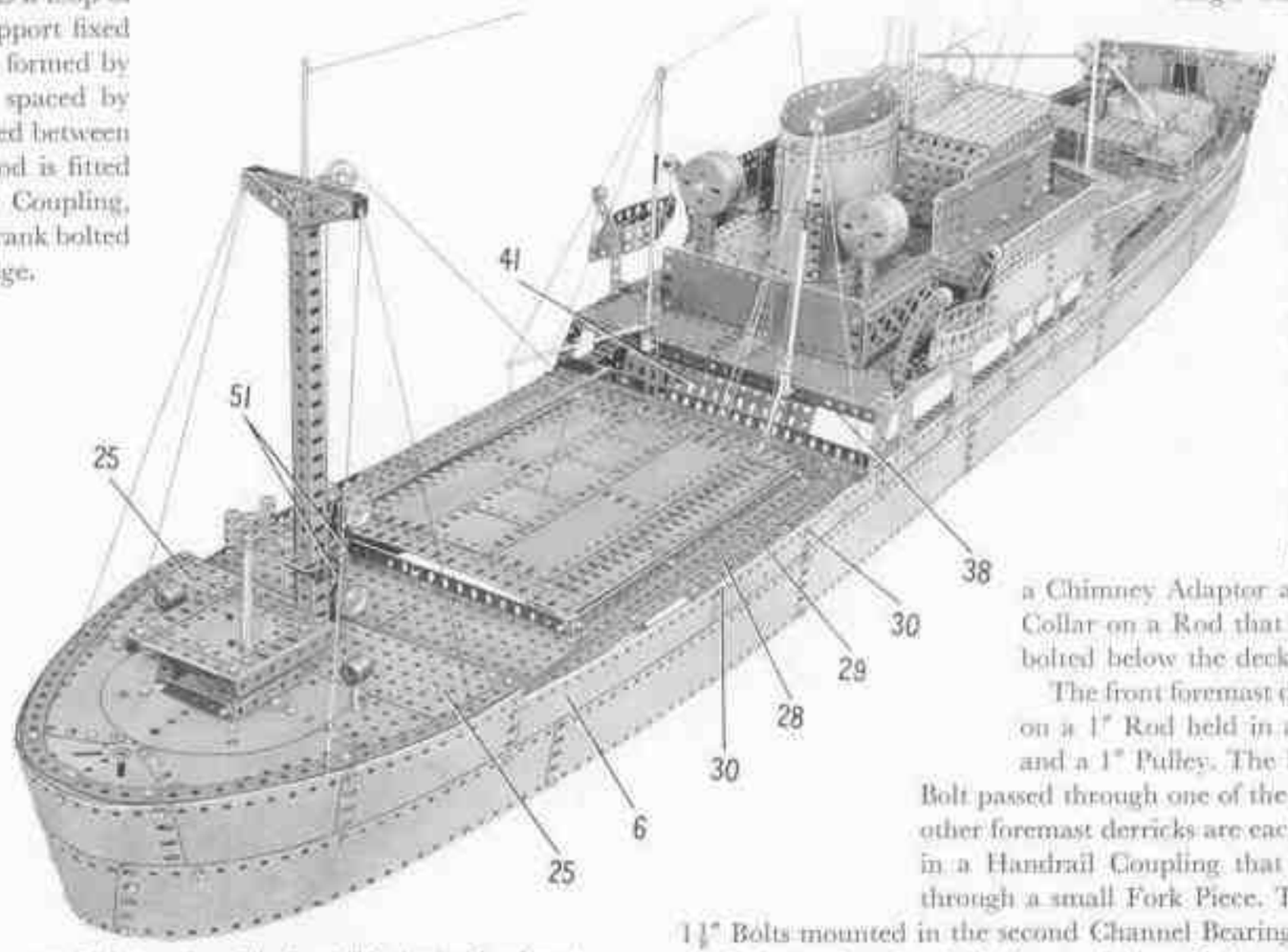


FIG. 7 *A stern view of the Cargo Ship showing the aft mast and details of the superstructure*

Deck Fittings and Derricks

The winch at the bows consists of a Ratchet Wheel, a 1½" Flanged Wheel, two ¾" Flanged Wheels, a ½" Pinion and a 50-tooth Gear, on a Rod mounted in Trunnions. The anchors are Double Arm Cranks fitted with Threaded Pins, and they are fixed on 1¼" Bolts passed through Threaded Bosses. The ventilator behind this winch is formed by a Chimney Adaptor and two Couplings held by a Collar on a Rod that is fastened in a Bush Wheel bolted below the deck.

The front foremast derrick is a 12½" Strip pivoted on a 1" Rod held in an End Bearing by a Collar and a 1" Pulley. The End Bearing is fixed on a ¾" Bolt passed through one of the Channel Bearings (48). The other foremast derricks are each formed by an 8" Rod fixed in a Handrail Coupling that pivots on a ¾" Bolt passed through a small Fork Piece. The Fork Pieces are fixed on 1½" Bolts mounted in the second Channel Bearing (48). The winch below the derricks consists of a ½" Pulley, a 1" loose Pulley and a 1" Gear on a Rod held in a Stepped Bent Strip.

The two port and starboard derricks in front of the bridge are each made by fixing a 5" Rod in a Swivel Bearing held by a Collar on an 11½" Rod that is gripped in the Face Plate 45.

The derricks aft of the funnel are each made by fixing a 6½" and a 3½" Rod joined by a Rod Connector, in a Handrail Support attached to the girder (38). The 6½" Rod is passed through the spider and one fork piece of a Universal Coupling, and the other fork piece supports a 5" Rod.

The aft mast derrick is made by screwing an 1½" Screwed Rod into the boss of a ½" Bevel Gear, which is fixed on a 1½" Rod mounted in a Single Bent Strip. A second Bevel Gear and a 1" loose Pulley are fitted on the Rod. The winch below the derrick consists of a 1" Gear, a 1" loose Pulley and a Pinion on a 1½" Rod supported in a Single Bent Strip.

Each of the ventilators on the bridge deck is formed by two Boiler Ends connected by a ¾" Bolt. The rear Boiler End is fixed by a nut on a Screwed Rod that is passed through a Sleeve Piece and the deck and is held in place by another nut.

The lifeboats are suspended by Cord passed round ½" loose Pulleys mounted on Pivot Bolts, which are fixed to 4" Stepped Curved Strips. The Curved Strips are bolted to Double Brackets attached to the deck. One side of each lifeboat is a 5½" Flat Girder; the other side is made from short Flat Girders joined together.

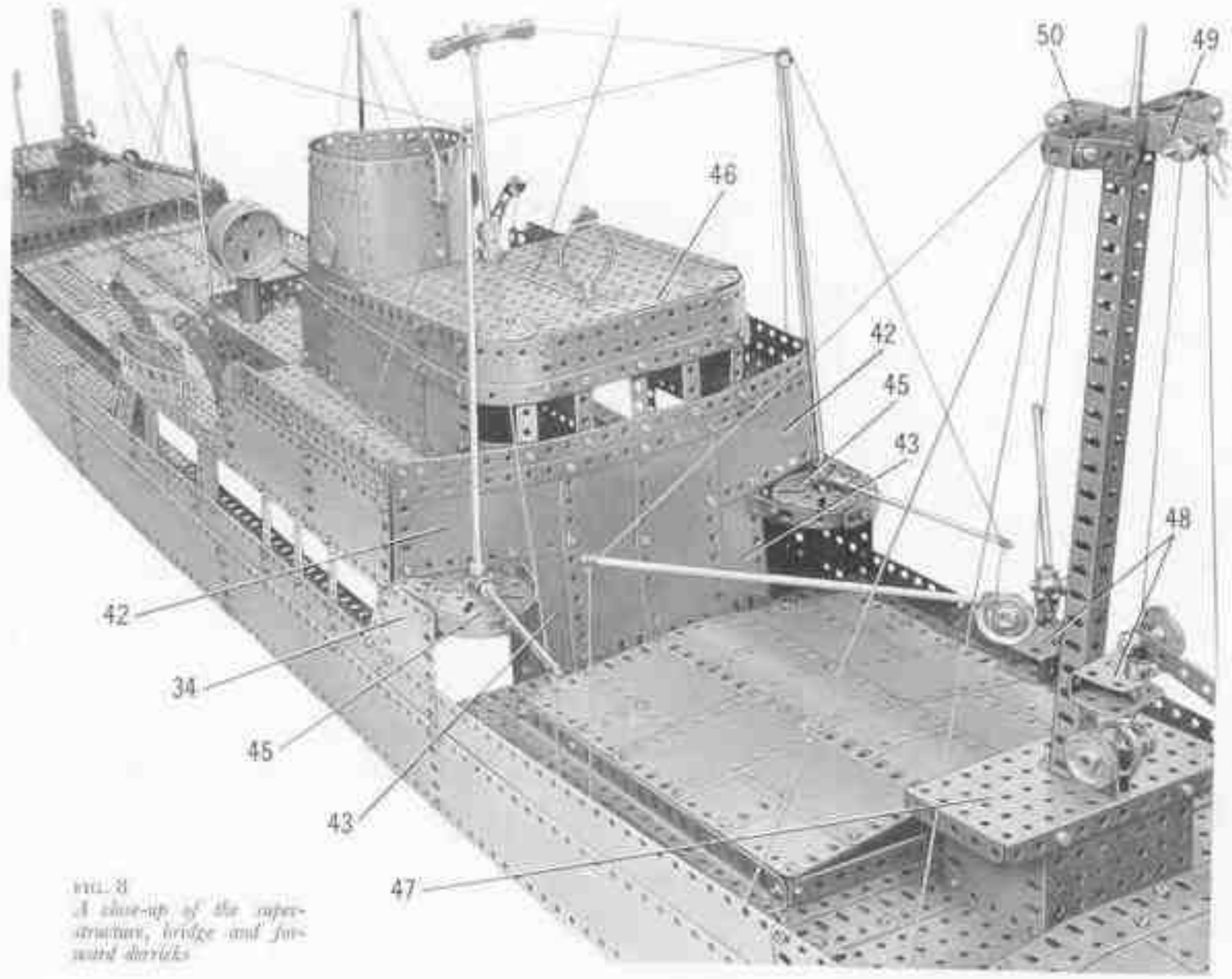


FIG. 8
A close-up of the superstructure, bridge and foremast derricks

The deck-house in the stern consists of two 2½" × 1½" Flanged Plates connected at their ends by 2½" Strips. Two 2½" × ½" Double Angle Strips are bolted between the Flanged Plates, and each of these supports a 3½" Strip to which the roof is fixed. The frame of the roof is formed by two 3½" × ½" Double Angle Strips and two 3½" Angle Girders, and it is filled in by two 2½" × 2½" Triangular Flexible Plates. The Flanged Plates are bolted to Double Bent Strips fixed to the deck.

The hatch covers can be seen clearly in Fig. 6.

The model is completed by adding wheels as shown in Figs. 3 and 4, and by arranging Cord to represent the rigging and the derrick ropes.

Parts Required to Build the Meccano Model Cargo Ship

24 of No.	1	9 of No.	9													1 of No.	154b	30 of No.	192
6 " "	1a	8 " "	9a	3 of No.	16	1 of No.	25	4 of No.	48d	2 of No.	73	2 of No.	103c	2 of No.	116a	2 " "	160	4 " "	196
6 " "	1b	2 " "	9b	4 " "	16a	1 " "	26	2 " "	51	1 " "	78	2 " "	103d	2 " "	124	1 " "	162	20 " "	197
36 " "	2	5 " "	9f	4 " "	18a	1 " "	27	4 " "	52	2 " "	81	2 " "	103e	6 " "	126	2 " "	162a	1 " "	198
7 " "	2a	20 " "	10	4 " "	18b	2 " "	30	6 " "	52a	2 " "	82	4 " "	103f	2 " "	133	2 " "	163	12 " "	199
17 " "	3	10 " "	11	1 " "	20	2 " "	31	6 " "	53	4 " "	89	2 " "	103g	4 " "	136	3 " "	164	12 " "	200
5 " "	4	50 " "	12	2 " "	20b	730 " "	37a	4 " "	53a	6 " "	89a	3 " "	103h	2 " "	136a	2 " "	165	2 " "	213
24 " "	5	8 " "	12a	2 " "	21	680 " "	37b	2 " "	54	4 " "	89b	4 " "	103k	2 " "	140	1 " "	166	2 " "	214
10 " "	6	7 " "	12b	6 " "	22	33 " "	38	1 " "	58	2 " "	90	3 " "	109	4 " "	142e	1 " "	171	9 " "	215
9 " "	6a	10 " "	12c	3 " "	22a	3 " "	40	24 " "	59	1 " "	94	10 " "	111	1 " "	144	4 " "	176	4 " "	221
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15 " "	8	4 " "	14	1 " "	24	1 " "	48	2 " "	64	4 " "	103	4 " "	111d	4 " "	147b	16 " "	190	2 " "	224
6 " "	8a	5 " "	15	2 " "	24a	6 " "	48a	4 " "	70	4 " "	103a	4 " "	115	1 " "	148	4 " "	190a	2 " "	225
4 " "	8b	1 " "	15b	2 " "	24c	4 " "	48b	2 " "	72	4 " "	103b	2 " "	116	1 " "	154a	16 " "	191	2 " "	226

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