

THIS MODEL CAN BE BUILT WITH MECCANO OUTFIT No. 10

Leaflet No. 1

MECCANO

Railway Service Crane

(MODEL No. 10.1)

SPECIAL FEATURES

The hoisting, lowering and luffing movements of the model are all driven by a Meccano E15R Motor through gearing, and the crane will lift considerable loads. The crane truck is strongly built and is mounted on eight wheels carried in swivelling bogies. Other details include outriggers and sliding doors in the cab.

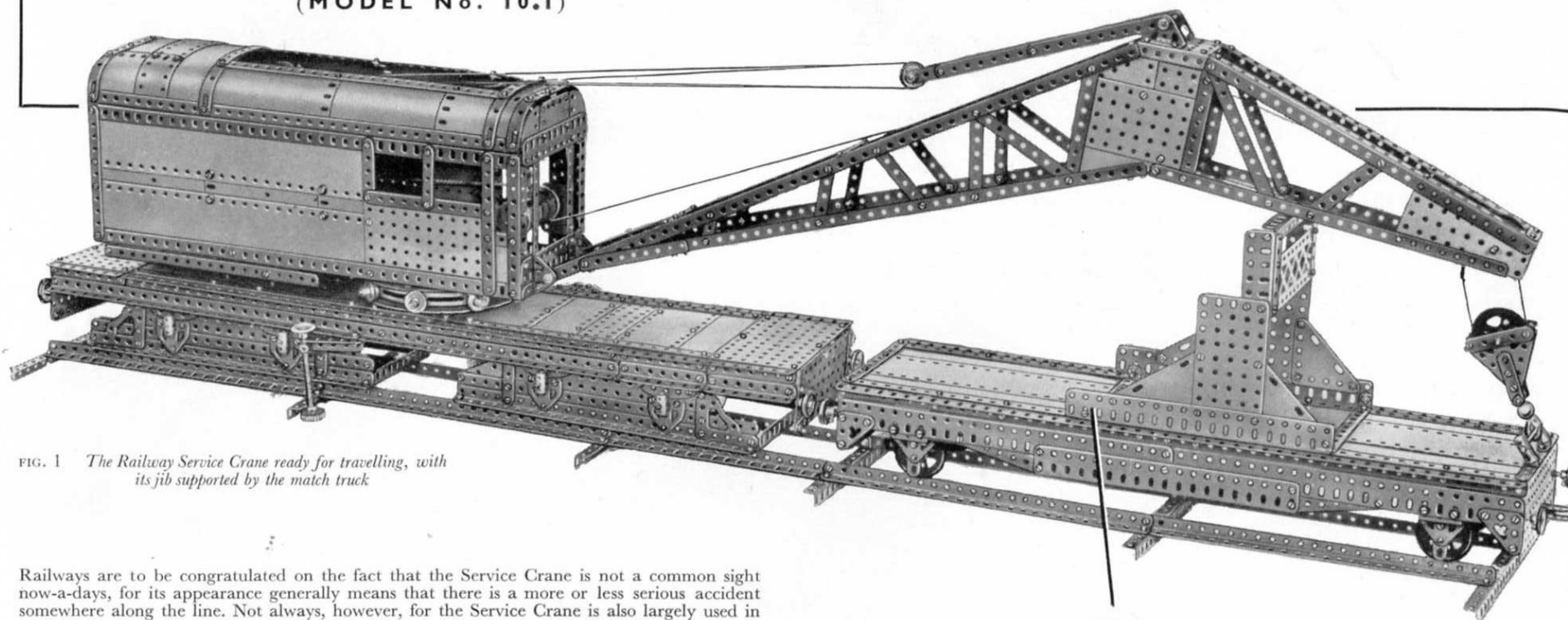


FIG. 1 The Railway Service Crane ready for travelling, with its jib supported by the match truck

Railways are to be congratulated on the fact that the Service Crane is not a common sight now-a-days, for its appearance generally means that there is a more or less serious accident somewhere along the line. Not always, however, for the Service Crane is also largely used in track laying operations and other constructional or maintenance work on the railways.

The Service train is usually made up of several vehicles in addition to the locomotive. These comprise vans containing tools, first-aid appliances, and accommodation for the train staff, and — most important from the Meccano boy's point of view — the crane itself. The latter is usually provided with a 'match truck', on which the jib rests when it is in the lowered position for travelling.

The Meccano model described in this leaflet is a faithful representation of a typical modern Service Crane. It reproduces the principal movements of its prototype and is fitted with outriggers and swivelling bogies. The crane is driven by a Meccano E15R Electric Motor and will lift considerable loads. The crane truck is about 30" in overall length and the match truck is approximately 24" long.

Crane Truck Underframe (Fig. 3)

Each side-member of the underframe consists of two built-up girders. One of these is a $24\frac{1}{2}$ " Angle Girder extended at each end by a $3\frac{1}{2}$ " Angle Girder and the other consists of a $24\frac{1}{2}$ " Angle Girder lengthened at one end by two $3\frac{1}{2}$ " Angle Girders. The built-up girders are connected together at the centre by a $2\frac{1}{2}$ " Flat Girder, and at each end by Fishplates.

The side-members are connected by two $5\frac{1}{2}$ " Angle Girders (1) and at each end a $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flat Plate is attached to the side-members by Angle Brackets. The Flat Plates are edged by $2\frac{1}{2}$ " and $5\frac{1}{2}$ " Strips, with a Stepped Bent Strip bolted to one of them to form a coupling between the crane truck and the match truck.

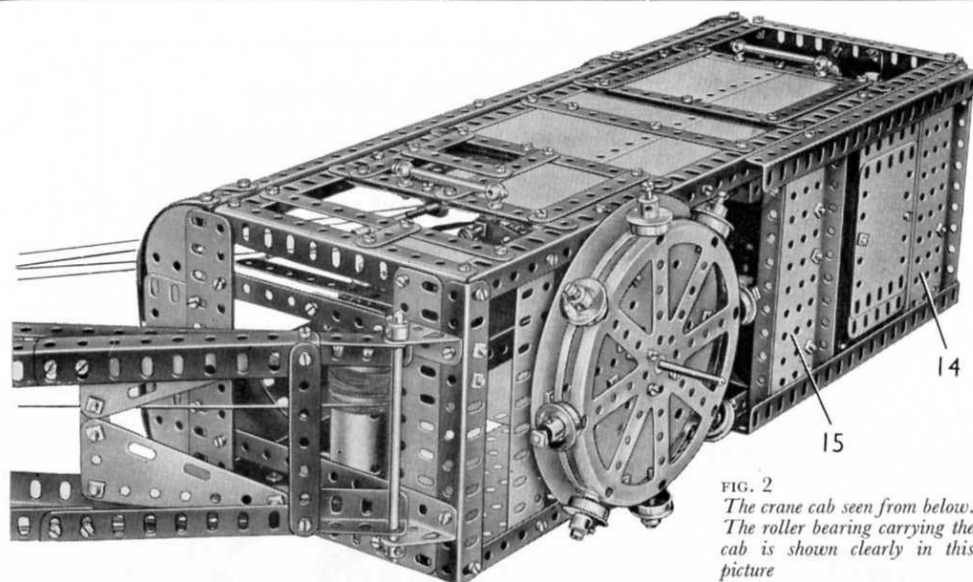


FIG. 2
The crane cab seen from below.
The roller bearing carrying the
cab is shown clearly in this
picture

Two $12\frac{1}{2}$ " Angle Girders (2) are fixed to each side-member and to these are bolted the Plates that fill in the top of the underframe. The top is formed by a $5\frac{1}{2}$ " \times $3\frac{1}{2}$ " Flat Plate at each end, two $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flat Plates (3), ten $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates, and another $5\frac{1}{2}$ " \times $3\frac{1}{2}$ " Flat Plate bolted to the centre of the underframe. A 4" Circular Plate (4) is fixed to this Flat Plate. The Plates that fill in the top are connected along their outer edges by two $12\frac{1}{2}$ " Strips on each side. Two $5\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strips (5) are fixed across the underframe as shown (Fig. 3).

The buffers at each end are 1" Pulleys, and they are held in place by $\frac{1}{2}$ " Bolts. The outrigger jacks are formed by Screwed Rods in Threaded Bosses, which are fixed to $2\frac{1}{2}$ " Angle Girders lock-nutted, so as to swivel, to the underframe.

The Crane Truck Bogies (Fig. 4)

In general design the two bogies are similar. Each consists of two $12\frac{1}{2}$ " Angle Girders (6) connected at their ends by $5\frac{1}{2}$ " Strips, to each of which a $4\frac{1}{2}$ " Angle Girder is fixed. To each of the Girders (6) are bolted a Corner Gusset and a vertical 2" Strip, and these support a $12\frac{1}{2}$ " Strip and a $7\frac{1}{2}$ " Flat Girder extended by a $1\frac{1}{2}$ " Flat Girder. A $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Triangular Flexible Plate is bolted to the Strip and the Flat Girder, at the opposite end to the Corner Gusset.

Two $4\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strips are bolted between the Flat Girders on each side, and to them is fixed a 3" Pulley (7). The springs and axle boxes are represented by $2\frac{1}{2}$ " Curved Strips and Flat Trunnions arranged as shown, with Couplings held in position by $\frac{1}{2}$ " and $\frac{3}{4}$ " Bolts. The wheels of one bogie are $1\frac{1}{2}$ " Flanged Wheels fixed on 5" Rods, but those of the other are made from Wheel Flanges bolted to Face Plates. The 5" Rods are held in position by Collars.

A $3\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flanged Plate is fixed to each of the Flat Plates (3) and two $3\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strips are bolted between the flanges of each Flanged Plate. A 3" Pulley (8) is attached to the Double Angle Strips, and a $2\frac{1}{2}$ " Rod held in the boss of this Pulley is passed through the Pulley (7) of one of the bogies. A $1\frac{1}{2}$ " Pulley on the Rod is used to keep the bogie in position.

Details of the Cab

The side seen in Fig. 10 is built up on a framework formed by two $18\frac{1}{2}$ " Angle Girders (9) joined at each end by a $5\frac{1}{2}$ " Angle Girder. The side is partly filled in by four $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates and two $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plates attached to three $5\frac{1}{2}$ " Strips, which are bolted to the Girders (9). The Plates are spaced from the Strips by Washers however, so that the sliding doors can pass freely in front of the Plates. At the front end of this side a $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate is bolted to the $5\frac{1}{2}$ " Angle Girder, and it is edged by a $1\frac{1}{2}$ " and a $5\frac{1}{2}$ " Strip.

The sliding door at the front end is made by bolting a $3\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate and three $3\frac{1}{2}$ " Strips between two $5\frac{1}{2}$ " Strips (10) (Fig. 8.) A $2\frac{1}{2}$ " Strip and a 3" Strip are attached to each Strip (10), but are spaced from it by a nut on each bolt. The ends of the Strips (10) are arranged in front of the Girders (9), and the 3" and $2\frac{1}{2}$ " Strips are placed behind the Girders to form guides for the door.

The rear door consists of two $4\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates and two $4\frac{1}{2}$ " Strips bolted to two $5\frac{1}{2}$ " Strips (11). A $5\frac{1}{2}$ " Strip is fixed behind each of the Strips (11), but the Strips are spaced apart by a nut on each bolt. These Strips form guides in the same way as those for the door at the front end.

The framework of the side seen in Fig. 1 is made in the same way as the one for the side already described. It is filled in with two $12\frac{1}{2}$ " \times $2\frac{1}{2}$ " Strip Plates, two $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plates, two $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plates and a $5\frac{1}{2}$ " \times $3\frac{1}{2}$ " Flat Plate. The window is edged by Strips as shown.

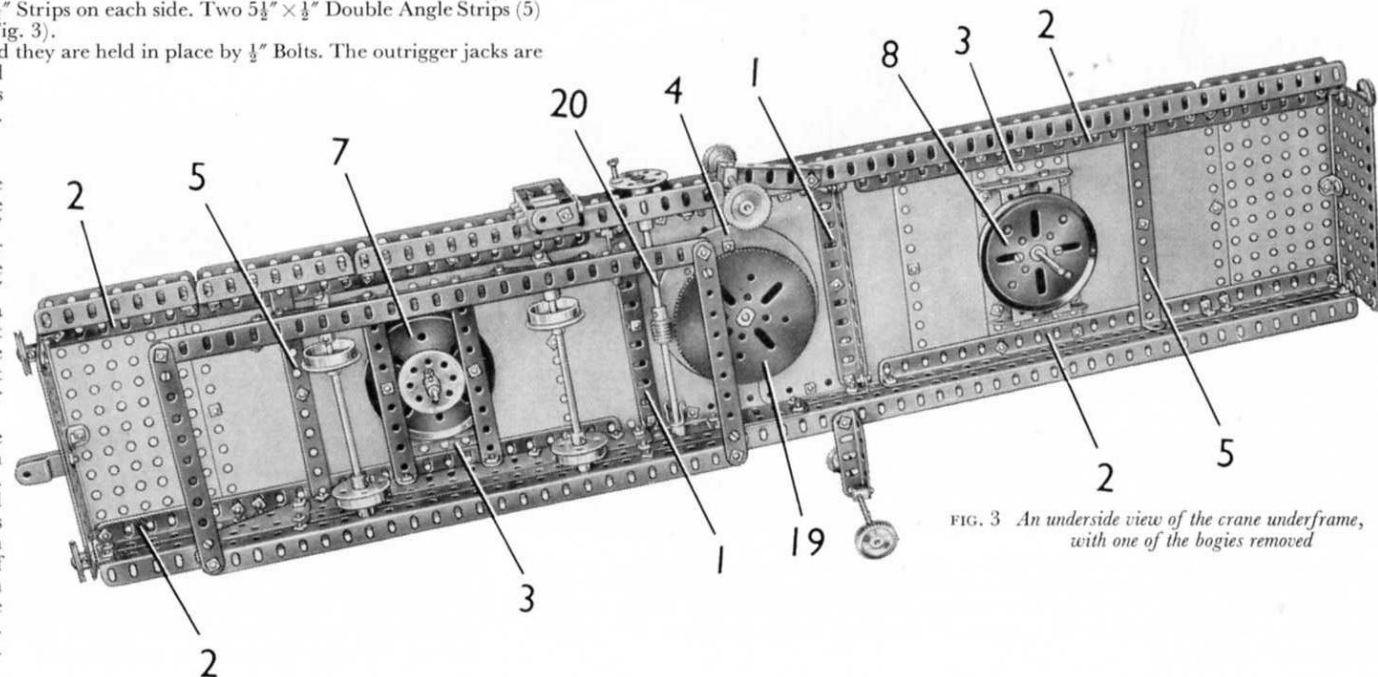


FIG. 3 An underside view of the crane underframe,
with one of the bogies removed

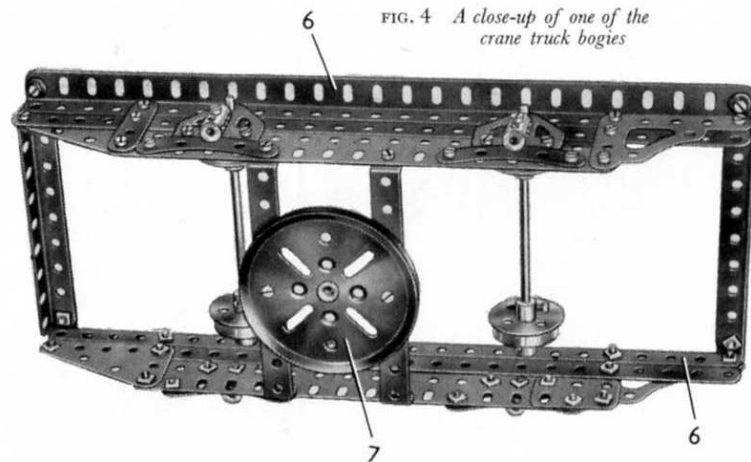


FIG. 4 A close-up of one of the crane truck bogies

The sides are connected at front and back by two $5\frac{1}{2}$ " Angle Girders bolted to the ends of the Girders (9). A $5\frac{1}{2}$ " Flat Girder is fixed to the top $5\frac{1}{2}$ " Angle Girder at each end, and to this are bolted a $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate and two Semi-Circular Plates. Another $5\frac{1}{2}$ " Flat Girder is fixed to the lower part of the front of the cab and two $5\frac{1}{2}$ " Strips (13) are bolted in position (Fig. 10). The back of the cab is filled in by a $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate and two $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates.

Two $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flanged Plates (14) and (15) (Fig. 2) are fixed to the base of the cab and between them are a $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " and a $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate. Two $9\frac{1}{2}$ " Angle Girders are attached to the flanges of the Flanged Plates. Seven $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates, fourteen $4\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates and three $3\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates are fixed to the floor between the Flanged Plates and act as a balance weight at the rear of the cab.

The Roller Bearing

A 6" Circular Plate is bolted to the lower one of the Girders (9) and to the corresponding Girder of the other side, but it is spaced from them by a nut on each bolt. The Circular Plate is supported also by a $5\frac{1}{2}$ " Angle Girder (16) and a $5\frac{1}{2}$ " Flat Girder (17) strengthened by a $5\frac{1}{2}$ " Strip. It is spaced from these parts by two nuts on each of the $\frac{3}{8}$ " Bolts that joins them together. A Bush Wheel (eight holes) is bolted to the centre of the Circular Plate, and two 1" Reversed Angle Brackets fixed to the Plate support four $2\frac{1}{2}$ " Strips (18) (Fig. 5).

The rollers are eight $\frac{3}{4}$ " Flanged Wheels. Six of these are freely mounted on $1\frac{1}{2}$ " Bolts, each of which is held by two nuts in a Hub Disc. The other two Wheels are retained by lock-nuts on 2" Screwed Rods, which are each fixed by two nuts in the Hub Disc.

A 6" Circular Plate is attached to the centre of the underframe by four $\frac{3}{8}$ " Bolts, but is spaced from it by four Washers on each Bolt.

A $3\frac{1}{2}$ " Rod is passed through the Strips (18) and is fixed in the boss of the Bush Wheel that is bolted to the Circular Plate attached to the cab. The Rod is passed freely through the Bush Wheel fixed to the Hub Disc, and through the centre of the 6" Circular Plate attached to the underframe. A $3\frac{1}{2}$ " Gear (19) (Fig. 3) is fixed to the Rod, but is spaced from the underframe by four $\frac{3}{4}$ " Washers and a Collar.

The cab can be rotated on the roller bearing by turning a Bush Wheel on a $6\frac{1}{2}$ " Rod (20) (Fig. 3). This Rod is held in place by a Collar and a small Fork Piece, and it carries a Worm that engages the $3\frac{1}{2}$ " Gear (19).

The Power Unit and Gear-Box

The housing for the gear-box is made by bolting three $3\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flanged Plates, one of them numbered (21) and the other two indicated at (22), to the Flanged Plate (15) (Fig. 5). The top flanges of the Flanged Plates are connected by a $3\frac{1}{2}$ " Flat Girder, to which is bolted a $3"$ \times $1\frac{1}{2}"$ Double Angle Strip. Two $3\frac{1}{2}"$ \times $\frac{1}{2}"$ Double Angle Strips are bolted to the Flanged Plate (21) and to one of the Flanged Plates (22). One of these Double Angle Strips is indicated at (23) and the other is attached in corresponding holes at the rear edges of the Flanged Plates (21) and (22).

An E15R Electric Motor is bolted to the Flanged Plate (14) (Fig. 2). A 50-tooth Gear on the armature shaft engages a $\frac{3}{4}"$ Pinion on an $11\frac{1}{2}"$ Rod. This Rod is mounted in the Motor side-plates and in the Double Angle Strips (23), and it carries a Worm that drives a 57-tooth Gear on a 4" Rod supported in the Flanged Plates (21) and (22). A $\frac{3}{4}"$ Pinion (24) is fixed on this Rod. Two 3" Rods (one of them is seen at (25) Fig. 5), are mounted in the Flanged Plates, and each of them is fitted with a 50-tooth Gear that can be engaged with the Pinion (24) by sliding the Rod. Rod (25) is fitted with a $\frac{3}{4}"$ Sprocket (26), and the other 3" Rod carries a $\frac{3}{4}"$ Sprocket 27.

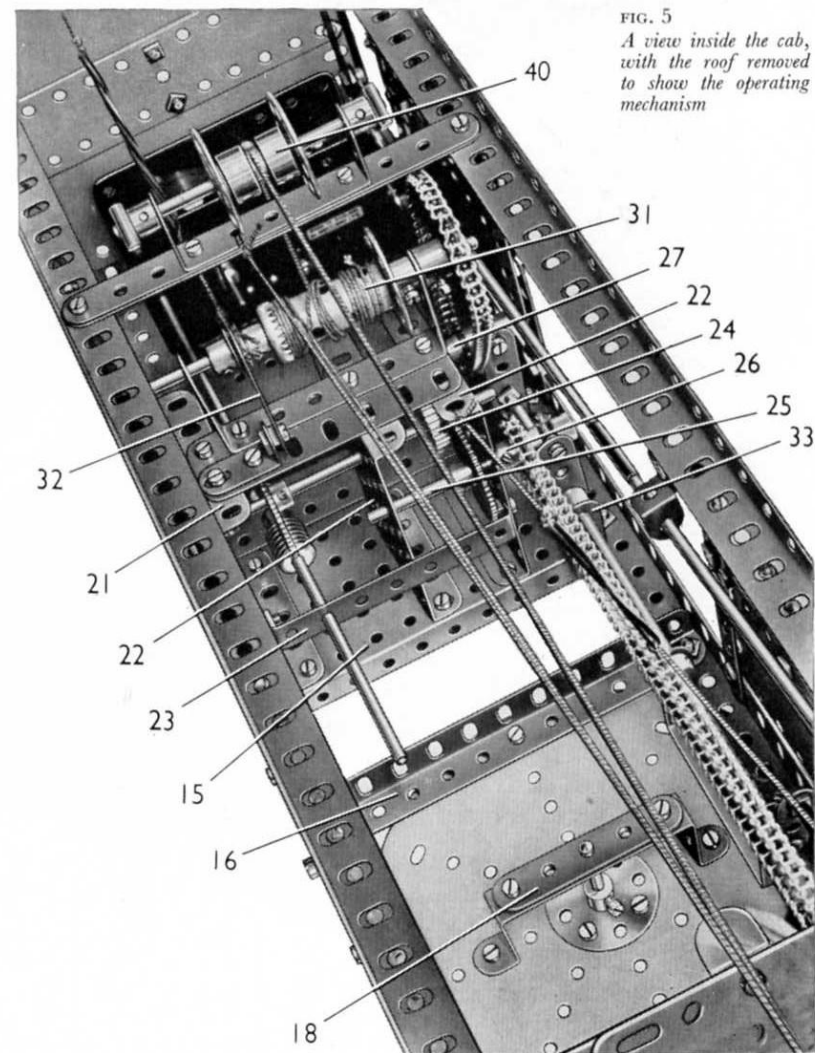


FIG. 5 A view inside the cab, with the roof removed to show the operating mechanism

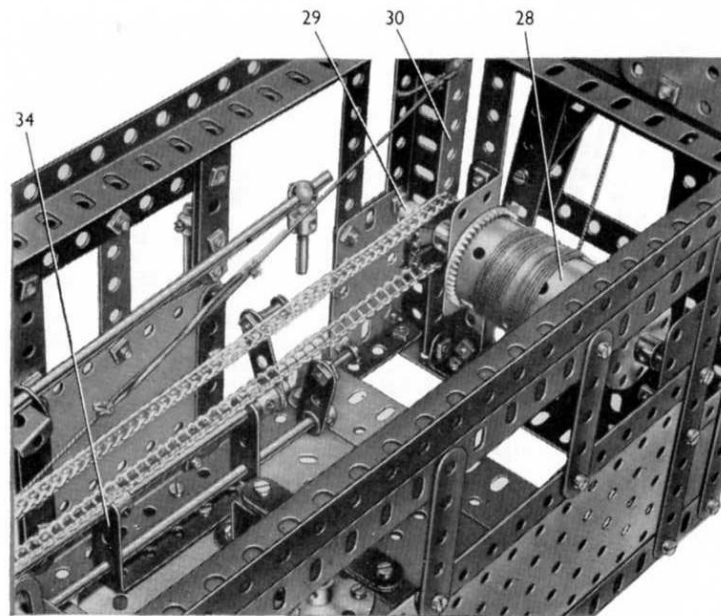


FIG. 6 The mechanism control levers and one of the winding drums are seen in this view

Sprocket (26) is connected by Chain to a 1" Sprocket on a $4\frac{1}{2}$ " Rod. This Rod is mounted in Girder Brackets bolted to the front of the cab, and it carries a winding drum (28) made from a Cylinder clamped between two $1\frac{1}{2}$ " Contrates. A $\frac{1}{2}$ " Pulley (29) is fixed on one end of the Rod and a $5\frac{1}{2}$ " Strip (30) engages in its groove (Fig. 6). The Strip is *lock-nutted* to a $1" \times \frac{1}{2}"$ Angle Bracket bolted to the base of the cab as shown. A length of Cord is tied to the top end of this Strip and to a Driving Band, which is stretched slightly and is connected by a length of Cord to one of the Flanged Plates (22). This arrangement provides a constant braking action on the winding drum.

The Sprocket (27) is connected by Chain to a 2" Sprocket on a 4" Rod, which is supported in the $3" \times 1\frac{1}{2}"$ Double Angle Strip. This Rod carries a winding drum (31) made from a Sleeve Piece held between a $\frac{3}{4}"$ Contrate and a Bush Wheel. A 2" Slotted Strip (32) engages in the groove of a $\frac{1}{2}"$ Pulley on the 4" Rod. The Slotted Strip is *lock-nutted* to a $1" \times \frac{1}{2}"$ Angle Bracket bolted to the Flat Girder that connects the Flanged Plates (21) and (22). A short piece of Cord is tied to the top end of the Slotted Strip and to a Driving Band, which is stretched slightly and is connected to Cord fastened to the back of the cab.

A $3" \times 1\frac{1}{2}"$ Double Angle Strip (33) is bolted to the Flanged Plate (15) (Fig. 5), and a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Double Angle Strip (34) (Fig. 6), is spaced from the 6" Circular Plate by a nut on the bolt that holds it in place. These Double Angle Strips support an 8" Rod (35) and an $11\frac{1}{2}"$ Rod (36). Each of these Rods carries at its front end a Crank fitted with a Pivot Bolt that forms a control handle. A Crank (Fig. 8) is fixed on Rod (35), and a $\frac{3}{8}"$ Bolt fixed in the Crank engages between two Collars on the end of rod (25). A Crank (37), extended upward by a 2" Strip fitted with a $\frac{3}{8}"$ Bolt, is fixed on the Rod (36). The $\frac{3}{8}"$ Bolt engages between two Collars on the Rod that carries the Sprocket (27).

A $3\frac{1}{2}"$ Strip (38) (Fig. 8) is *lock-nutted* at its upper end to an Angle Bracket bolted to the upper one of the Girders (9). The lower end of Strip (38) is *lock-nutted* to an arm of the E15R Electric Motor switch. A Rod and Strip Connector is *lock-nutted* to the Strip (38), and is fitted with an 8" Rod joined to a $6\frac{1}{2}"$ Rod by a Rod Connector. The $6\frac{1}{2}"$ Rod is supported by a Corner Angle Bracket bolted to the side of the cab, and it carries a handle (39) formed by a 1" Rod held in a Handrail Coupling.

Two $5\frac{1}{2}"$ Strips placed face to face are bolted across the top of the cab and to them is fixed a $2\frac{1}{2}" \times 1"$ Double Angle Strip. A $3\frac{1}{2}"$ Rod held in the Double Angle Strip by Slide Pieces, carries a built-up pulley (40), which is made from a Socket Coupling and two Bush Wheels.

Assembly of the Cab Roof

Two $18\frac{1}{2}"$ Angle Girders are fixed to the Girders of the upper edges of the cab sides, and these support the Flexible Plates that form the roof. The general arrangement of these Plates can be seen in Figs. 1, 7 and 10.

Details of the Jib (Fig. 10)

The upper side members of the inner section of the jib each consist of a $24\frac{1}{2}"$ Angle Girder (41) (Fig. 10)—the lower members of this section are built-up girders (42) and are each made from an $18\frac{1}{2}"$ Angle Girder and a $4\frac{1}{2}"$ Angle Girder overlapped two holes. These parts are bolted together at their lower ends, and are connected at their upper ends by a $4\frac{1}{2}"$ Strip (43). A $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flat Plate, a $3" \times 1\frac{1}{2}"$ Flat Plate, a $2\frac{1}{2}" \times 2"$ Triangular Flexible Plate (44) and a $3\frac{1}{2}" \times 2"$ Triangular Flexible Plate (45) are bolted together and are fixed to the Strip (43).

A $2\frac{1}{2}"$ Angle Girder (46) is connected to the Girder (41) by an Obtuse Angle Bracket, and is similarly connected to a $12\frac{1}{2}"$ Angle Girder (47). The Girder (47) is bolted to the top end of a $4\frac{1}{2}"$ Strip that is bolted to the Flat Plates, and another $12\frac{1}{2}"$ Angle Girder (48) is fixed to the lower end of the same Strip. The Girders (47) and (48) are connected at their front ends by a Flanged Sector Plate.

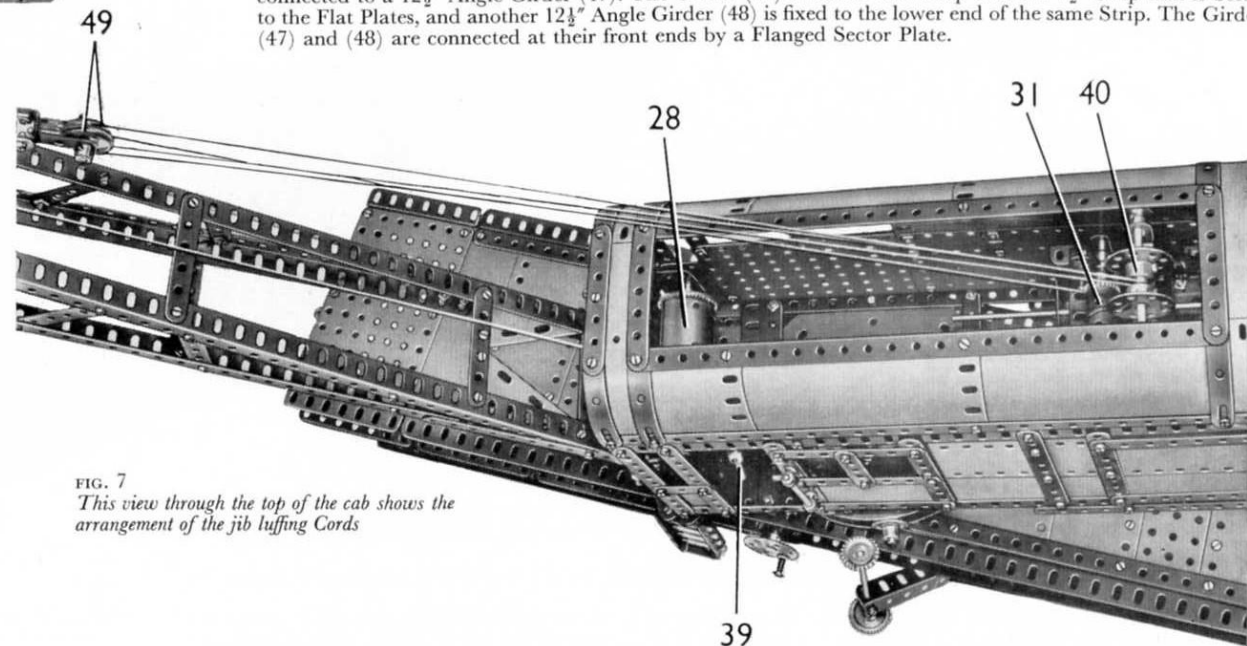


FIG. 7 This view through the top of the cab shows the arrangement of the jib luffing Cords

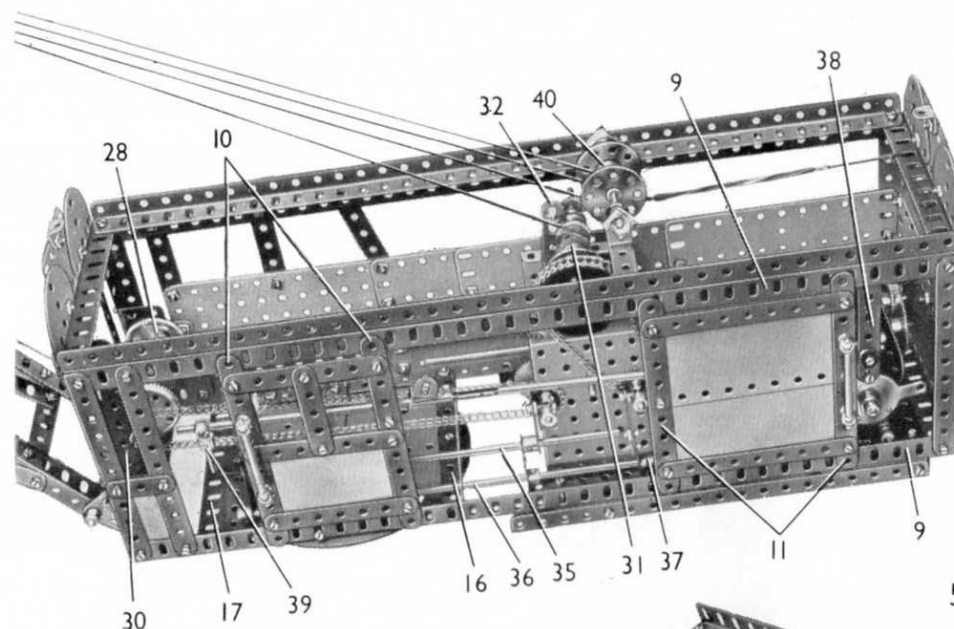


FIG. 8 The sliding doors, and the position of the E15R Electric Motor, can be seen in this view of the cab

The side-members of the jib are connected by $3\frac{1}{2}$ " and 3" Strips bolted between the Girders (41) and the built-up girders (42) of each side. A $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flat Plate is fixed between the Girders (46), and at the jib head the Girders (47) are connected by a $1\frac{1}{2}$ " Strip. The Girders (48) are joined by a $1\frac{1}{2}$ " Angle Girder.

Two Trunnions are fixed to the $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flat Plate bolted to the Girders (46), and these support a 2" Rod on which two built-up strips are held by Rod Sockets. Each of these strips is made from two $5\frac{1}{2}$ " Strips overlapped four holes. A Single Bent Strip is bolted to a Double Bracket fixed to the lower ends of the built-up strips, and a 1" Rod held by Collars in the Single Bent Strip carries two 1" loose Pulleys (49).

A 3" Pulley is fixed on a $3\frac{1}{2}$ " Rod (50), and a 2" Pulley at the jib head is held on a $2\frac{1}{2}$ " Rod (51).

The jib pivots on a $4\frac{1}{2}$ " Rod, which is supported in Trunnions bolted to the front of the cab.

Arrangement of the Jib Luffing and Load Hoisting Cords (Figs. 8 and 10)

The luffing Cord is fastened to the drum (31), then taken round one of the 1" Pulleys (49) and round the built-up pulley (40). The Cord is then taken round the second of the Pulleys (49), and is tied to the $5\frac{1}{2}$ " Strips that support the mounting for the pulley (40).

The hoisting Cord is tied to the drum (28), taken over the Pulleys on Rods (50) and (51), round a 2" Pulley in the pulley block and is tied finally to the jib head.

The pulley block consists of two $2\frac{1}{2}$ " Triangular Plates connected by three Double Brackets, and the 2" Pulley is mounted on a $1\frac{1}{2}$ " Rod. A large Loaded Hook is held by a $\frac{3}{4}$ " Bolt supported by two 2" Strips, each of which is bolted to one of the Triangular Plates.

The Match Truck (Fig. 9)

The top of the match truck is made by connecting two $24\frac{1}{2}$ " Angle Girders at their ends by $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flanged Plates (52). The top is filled in by two $12\frac{1}{2}$ " \times $2\frac{1}{2}$ " Strip Plates along the centre and two $9\frac{1}{2}$ " \times $2\frac{1}{2}$ " Strip Plates at each side. At the middle two $5\frac{1}{2}$ " \times $3\frac{1}{2}$ " Flat Plates are bolted to the ends of the Strip Plates (Fig. 9), and are connected to the sides by $2\frac{1}{2}$ " Angle Girders. The $9\frac{1}{2}$ " \times $2\frac{1}{2}$ " Strip Plates are supported by 3" and $4\frac{1}{2}$ " Angle Girders bolted to the $24\frac{1}{2}$ " Angle Girders.

Each side of the match truck is extended downward by two $12\frac{1}{2}$ " Flat Girders. These are bolted to the Flanged Plates (52) and are braced by $1\frac{1}{2}$ " Corner Brackets, and at the centre are connected by a Fishplate to the $24\frac{1}{2}$ " Angle Girder. A $9\frac{1}{2}$ " Flat Girder (53) is bolted to each side as shown.

The wheels are 2" Pulleys, each of which is free to turn on a 5" Rod fixed in Double Arm Cranks bolted to Trunnions. The Trunnions are supported by $1\frac{1}{2}$ " Angle Girders fixed to the Flat Girders (Fig. 9). Each wheel is spaced from the Double Arm Crank by a $\frac{1}{2}$ " loose Pulley, and is held in position by a $\frac{1}{4}$ " Pinion.

The buffers are 1" Pulleys locked on Threaded Pins fixed in the Flanged Plates (52).

A $9\frac{1}{2}$ " Flat Girder (54) on each side is bolted at one end to the lug of a $5\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip fixed across the match truck, and at its other end the Flat Girder is attached to an Angle Bracket. A $4"$ \times $2\frac{1}{2}"$ Flat Plate is bolted to each of the Flat Girders (54) and is extended upward by a 3" Flat Girder and a 3" Angle Girder. The 3" Angle Girders are connected by a $5\frac{1}{2}"$ Braced Girder and a $5\frac{1}{2}"$ Angle Girder. The Flat Plates are braced by $3\frac{1}{2}"$ \times $2\frac{1}{2}"$ Triangular Flexible Plates and $2\frac{1}{2}"$ \times $2\frac{1}{2}"$ Triangular Flexible Plates bolted to the Flat Girders (54).

In the travelling position the crane hook is anchored on a $3\frac{1}{2}"$ Rod (55), which is fixed in two Strip Couplings. These pivot on $\frac{3}{8}"$ Bolts passed through the lugs of a $2\frac{1}{2}"$ \times $\frac{1}{2}"$ Double Angle Strip bolted to the top of the truck.

Note: Some of the Collars used in this model are obtained by removing the 'spiders' from Swivel Bearings and Universal Couplings

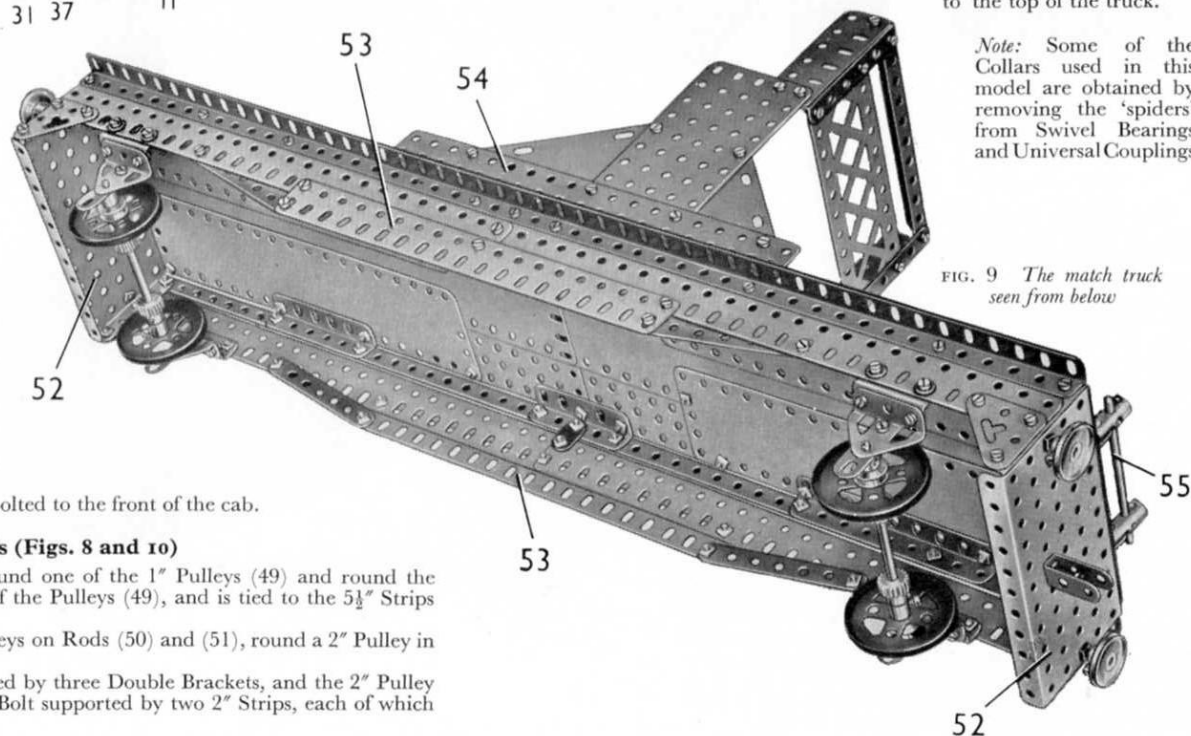


FIG. 9 The match truck seen from below

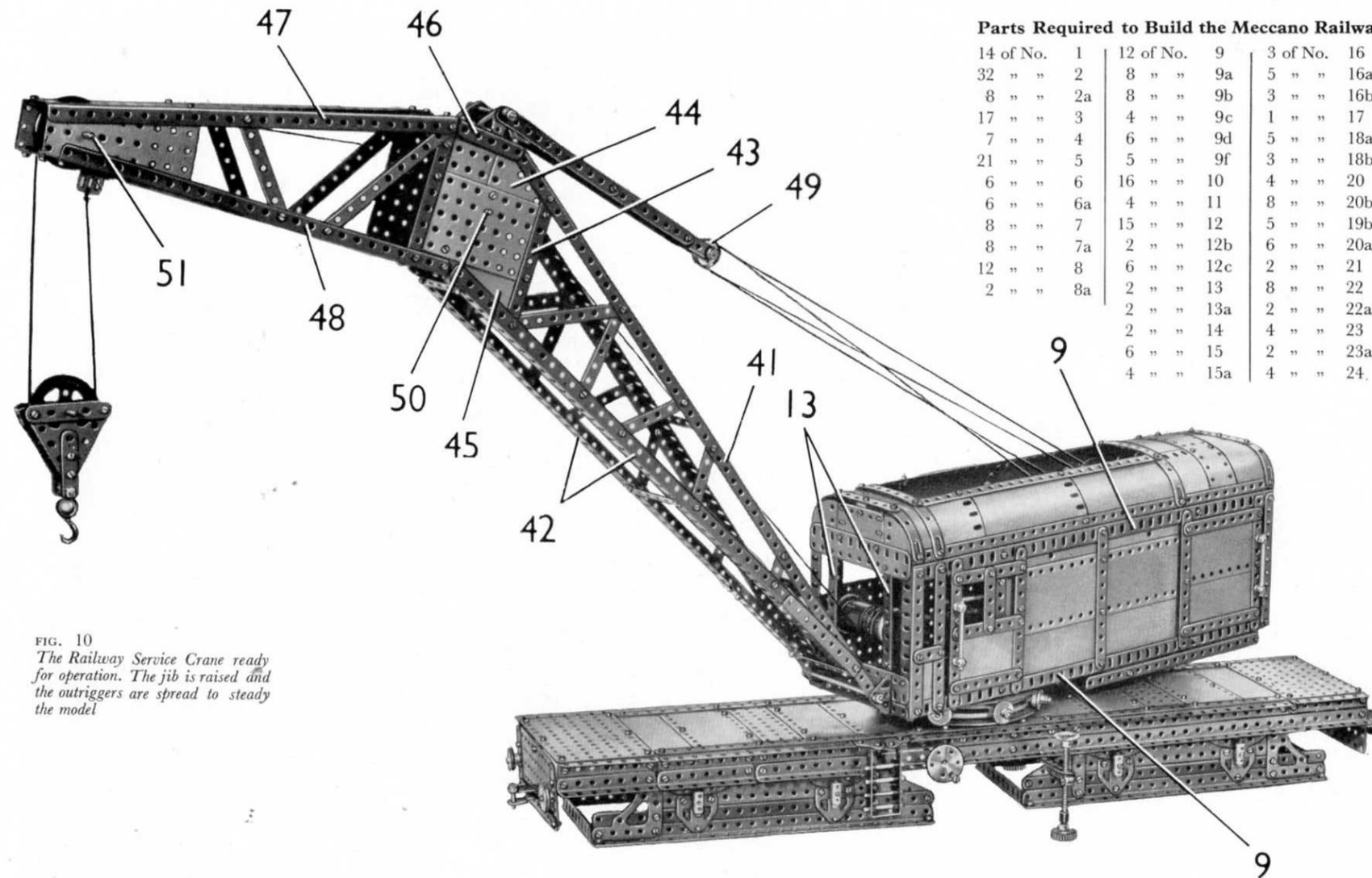


FIG. 10
The Railway Service Crane ready
for operation. The jib is raised and
the outriggers are spread to steady
the model

Parts Required to Build the Meccano Railway Service Crane

14 of No. 1	12 of No. 9	3 of No. 16	2 of No. 24b
32 " " 2	8 " " 9a	5 " " 16a	2 " " 25
8 " " 2a	8 " " 9b	3 " " 16b	4 " " 26
17 " " 3	4 " " 9c	1 " " 17	3 " " 27
7 " " 4	6 " " 9d	5 " " 18a	1 " " 27a
21 " " 5	5 " " 9f	3 " " 18b	1 " " 27b
6 " " 6	16 " " 10	4 " " 20	2 " " 28
6 " " 6a	4 " " 11	8 " " 20b	1 " " 29
8 " " 7	15 " " 12	5 " " 19b	2 " " 30
8 " " 7a	2 " " 12b	6 " " 20a	2 " " 31
12 " " 8	6 " " 12c	2 " " 21	2 " " 32
2 " " 8a	2 " " 13	8 " " 22	8 " " 35
	2 " " 13a	2 " " 22a	723 " " 37a
	2 " " 14	4 " " 23	634 " " 37b
	6 " " 15	2 " " 23a	82 " " 38
	4 " " 15a	4 " " 24	4 " " 38d
			2 " " 40
			2 " " 44
			3 " " 46
			1 " " 47
			2 " " 47a
			1 " " 48a
			6 " " 48b
			4 " " 48c
			4 " " 48d
			2 " " 50

4 of No. 52	4 of No. 62b	1 of No. 80c	2 of No. 102	4 of No. 108	2 of No. 124	2 of No. 146	4 of No. 221
6 " " 52a	8 " " 63	2 " " 81	4 " " 103	4 " " 109	8 " " 126	1 " " 146a	2 " " 222
5 " " 53	2 " " 63b	1 " " 82	4 " " 103a	5 " " 111	8 " " 126a	2 of No. 179	2 " " 223
4 " " 53a	2 " " 64	8 " " 90	4 " " 103b	12 " " 111a	4 " " 133	3 " " 186	2 " " 224
2 " " 54	4 " " 70	1 " " 94	1 " " 103d	15 " " 111c	2 " " 133a	1 " " 186a	2 " " 225
2 " " 55a	1 " " 72	1 " " 95	2 " " 103e	6 " " 111d	4 " " 136	7 " " 188	2 " " 226
1 " " 57b	2 " " 73	1 " " 96	2 " " 103f	4 " " 115	1 " " 136a	9 " " 189	1 E15R
24 " " 59	2 " " 76	2 " " 96a	4 " " 103h	1 " " 116a	4 " " 137	4 " " 190a	Electric Motor
4 " " 62	1 " " 80a	1 " " 100	4 " " 103k	1 " " 118	1 " " 144	1 " " 171	(not included
						1 " " 173a	in Outfit)
						16 " " 191	
						30 " " 192	
							4 of No. 196
							4 " " 197
							4 " " 200
							1 " " 212
							1 " " 213
							4 " " 214
							8 " " 215
							1 " " 216