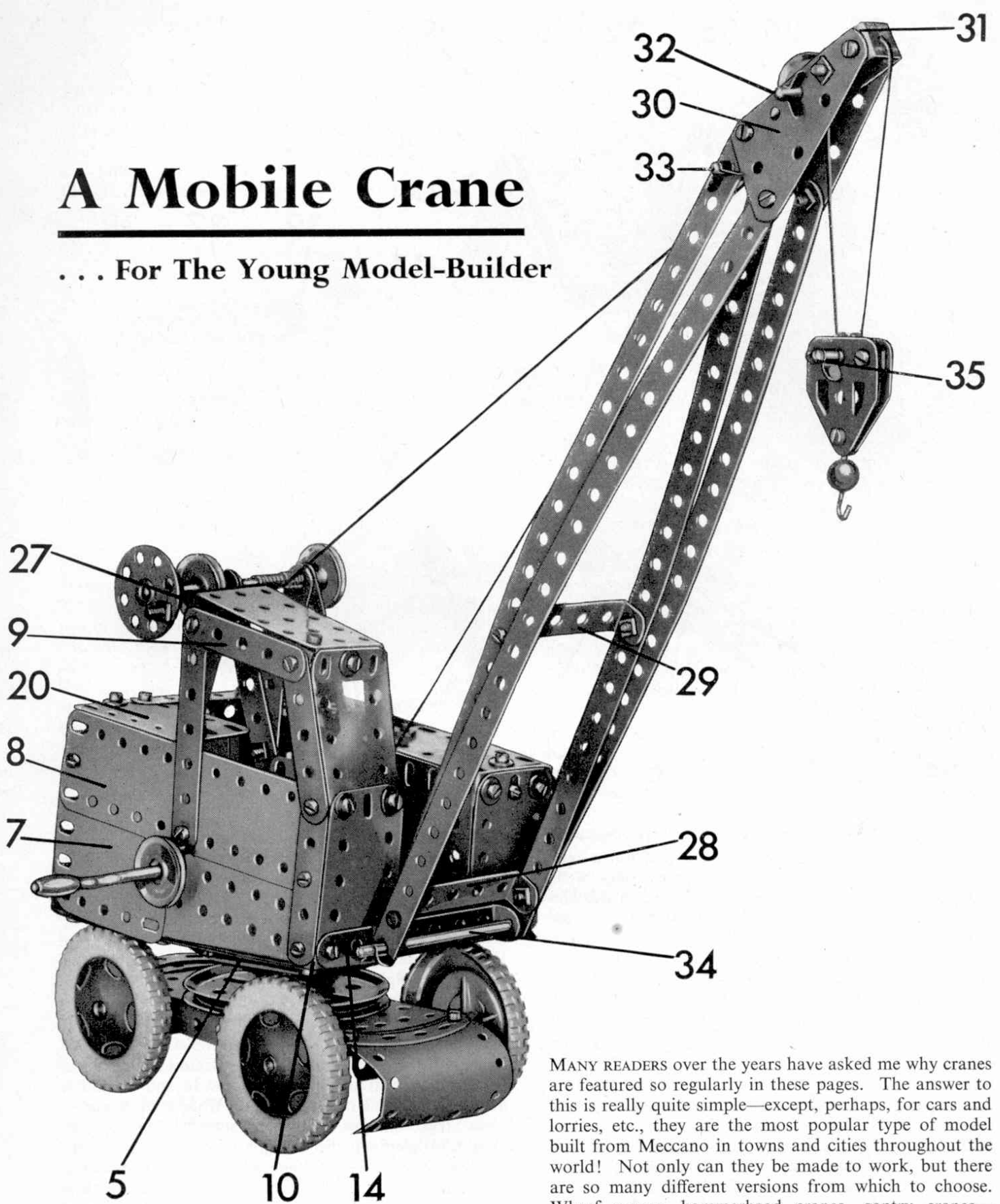


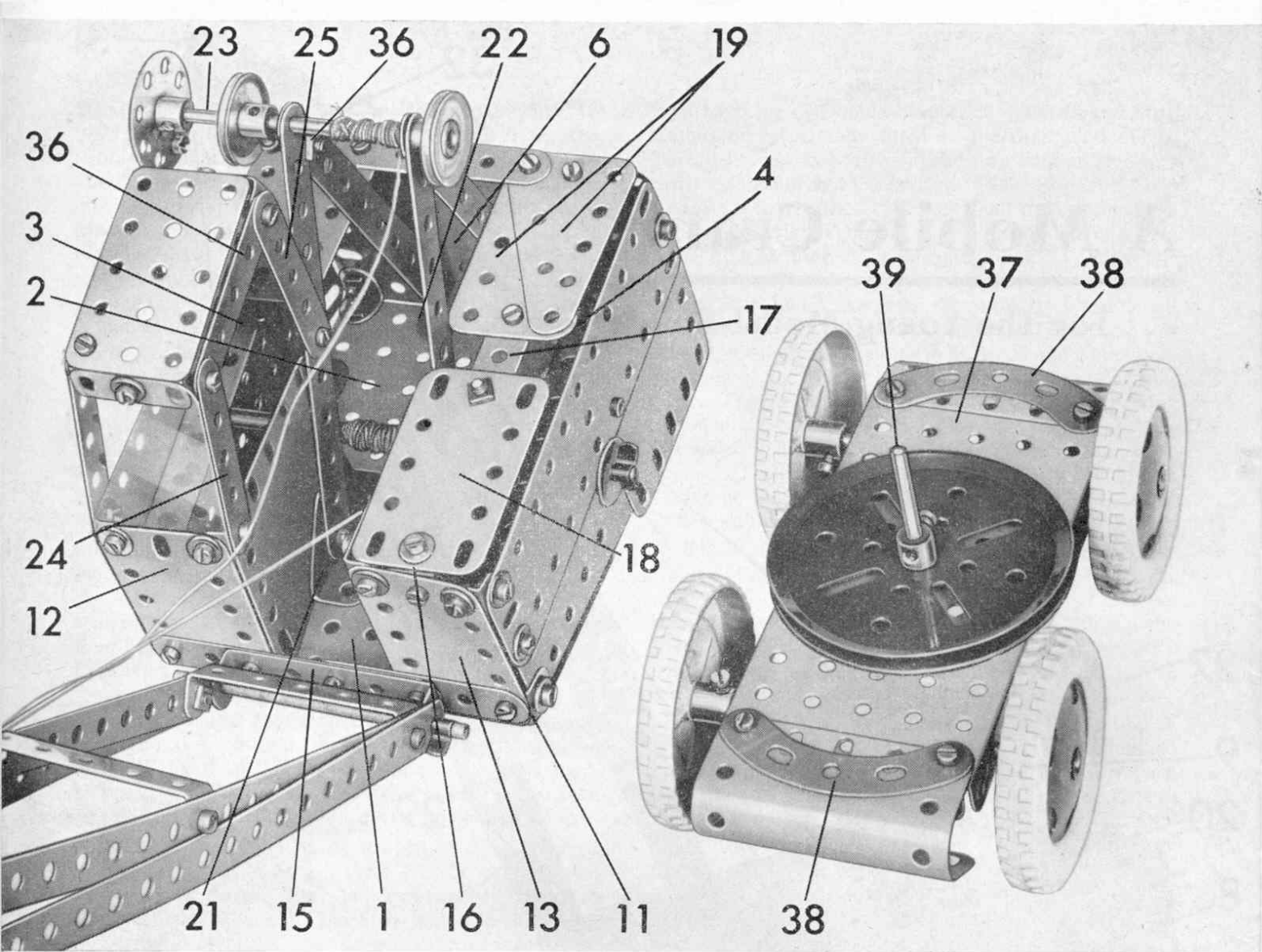
# A Mobile Crane

... For The Young Model-BUILDER



MANY READERS over the years have asked me why cranes are featured so regularly in these pages. The answer to this is really quite simple—except, perhaps, for cars and lorries, etc., they are the most popular type of model built from Meccano in towns and cities throughout the world! Not only can they be made to work, but there are so many different versions from which to choose. Wharf cranes, hammerhead cranes, gantry cranes—these are just a few of the many varieties which can be seen in any port from London to Leningrad, and all of them, at one time or another, have been accurately reproduced in Meccano.

Of the numerous types of load-moving machines in existence today, one of the biggest model-building



successes is the Mobile crane. The model described here is based on such a structure, although it is not a very complicated example, but it does operate very well. The jib can be raised and lowered at will, as can the hook, and the whole superstructure swivels on a free-running, wheeled base. As can be seen, the jib makes use of four  $12\frac{1}{2}$  in Strips. These can be replaced by built-up strips, using smaller Perforated Strips, if you do not possess any, or all, of the largest size. The base itself can be enlarged to give greater stability to the model but, in this event, remember to move the pivot-point accordingly.

Basic construction is as follows: two  $4\frac{1}{2}$  in by  $2\frac{1}{2}$  in Flat Plates 1 and 2 are bolted to the lower flanges of two Flanged Sector Plates 3 and 4, the same bolts also holding two  $5\frac{1}{2}$  in Strips against the underside of the Plates, one at each side. Note, however, that the Plates 1 and 2 are fixed to the Sector Plates with one hole of the flanges separating them, which results in a gap of about half-an-inch between the two. A 3 in Pulley 5 is fixed below the Flat Plates by a  $\frac{1}{2}$  in and  $\frac{3}{8}$  in Bolts, with its boss protruding upwards through this gap. The Pulley is spaced from the Plate at the front by a 1 in loose Pulley on the forward  $\frac{1}{2}$  in Bolt.

A  $4\frac{1}{2}$  in by  $2\frac{1}{2}$  in Flexible Plate is connected to the back

of Plate 2 by two Angle Brackets and a further  $4\frac{1}{2}$  in by  $2\frac{1}{2}$  in Flexible Plate 6, overlapping four holes, is fixed to this by bolts through the corner holes of the first Flexible Plate. These bolts also hold Double Brackets in position. Each side of the body is similarly built, using a  $2\frac{1}{2}$  in by  $2\frac{1}{2}$  in Flexible Plate, 7, and a  $5\frac{1}{2}$  in by  $1\frac{1}{2}$  in Flexible Plate 8, the only difference being that the bolts used in the right-hand side also hold a  $3\frac{1}{2}$  in and two  $2\frac{1}{2}$  in Strips which form part of the cab. The Strips are arranged as shown and are joined by another  $2\frac{1}{2}$  in Strip 9.

Angle Brackets 10 and 11 are fitted, and to these are bolted  $2\frac{1}{2}$  in by  $1\frac{1}{2}$  in Flexible Plates 12 and 13 and a  $4\frac{1}{2}$  in compound strip 14, built up from a  $3\frac{1}{2}$  in and a  $2\frac{1}{2}$  in Strip. To this, in turn, is bolted a  $2\frac{1}{2}$  in by  $\frac{1}{2}$  in Double Angle Strip 15. A  $2\frac{1}{2}$  in by  $\frac{1}{2}$  in Double Angle Strip 16 is attached to Plate 13 and a corresponding Angle Bracket is fixed to Plate 6. The two are then joined by a  $5\frac{1}{2}$  in Strip 17 at the same time bolting in place a  $2\frac{1}{2}$  in by  $1\frac{1}{2}$  in Red Plastic Plate 18 and two  $2\frac{1}{2}$  in by  $1\frac{1}{2}$  in Triangular Flexible Plates 19. A Red Plastic Plate 20 is bolted to another  $2\frac{1}{2}$  in by  $\frac{1}{2}$  in Double Angle Strip attached to Plate 6.

Two Trunnions 21 and two Reversed Angle Brackets 22, only one each of which can be seen in the illustrations,

are bolted to the floor of the cab and to these are fixed four  $5\frac{1}{2}$  in Strips, connected at the top, as shown, by a  $3\frac{1}{2}$  in Rod 23. The Rod is held in position by two 1 in fixed Pulleys, and an 8-hole Bush Wheel, carrying a  $\frac{3}{8}$  in Bolt as a handle, is also attached.  $2\frac{1}{2}$  in by  $2\frac{1}{2}$  in Flexible Plates are also fixed to Trunnions 23, by the bolts holding the  $5\frac{1}{2}$  in Strips, and they are secured to Plates 12 and 13 by Angle Brackets. The bolt holding the right-hand Plate holds, in addition, a  $2\frac{1}{2}$  in Strip 24, and a similar  $2\frac{1}{2}$  in Strip 25 is bolted to one of the  $5\frac{1}{2}$  in Strips. The two are then connected by yet another  $2\frac{1}{2}$  in Strip 26.

Having now been constructed, the sides of the cab are joined, at the rear, by a  $1\frac{1}{2}$  in by  $\frac{1}{2}$  in Double Angle Strip 27, to which a  $2\frac{1}{2}$  in by  $1\frac{1}{2}$  in Flanged Plate is bolted. This Flanged Plate is joined to Strips 9 and 26, at the front ends, by Angle Brackets. The windscreen is a  $2\frac{1}{2}$  in by  $1\frac{1}{2}$  in Transparent Plastic Plate fixed in position as shown in the illustrations.

The jib is built-up from four  $12\frac{1}{2}$  in Strips spaced apart, in pairs, by two  $2\frac{1}{2}$  in by  $1\frac{1}{2}$  in Double Angle Strips 28 and 29. A  $2\frac{1}{2}$  in by  $1\frac{1}{2}$  in Triangular Flexible Plate 30 is fixed to the end of each by a 1 in by  $\frac{1}{2}$  in Double Bracket 31. A  $1\frac{1}{2}$  in Rod 32, carrying a 1 in Loose Pulley, is journalled in Plates 30 being held in place by Spring Clips. Another  $1\frac{1}{2}$  in Rod 33 is journalled in two of the  $12\frac{1}{2}$  in Strips and is held by a Spring Clip on one side and a Cord Anchoring Spring on the other. The jib is pivotally attached to the body by a  $3\frac{1}{2}$  in Rod 34 that passes through the end holes of the  $12\frac{1}{2}$  in Strips and the lugs of the Double Angle Strip 15. The Rod is held by Spring Clips.

The hook consists of two Flat Trunnions held together, but spaced at their bases by two  $\frac{3}{8}$  in Bolts each carrying three nuts on its shank. A Small Loaded Hook is held at the apex of the Flat Trunnions by a nut and bolt, and a  $\frac{1}{2}$  in Loose Pulley is fitted on to a 1 in Rod 35 that is held by Spring Clips. The Flat Trunnions must be held far enough apart by the nuts on the  $\frac{3}{8}$  in Bolts to allow this Pulley to turn freely. Cord for the hook is anchored to Double Bracket 3, passed around the  $\frac{1}{2}$  in Pulley on Rod 32 and is finally wound on a  $3\frac{1}{2}$  in Crank Handle, extended by a 2 in Rod in a Rod Connector, journalled in the Flanged Sector Plates 3 and 4. A 1 in Fixed Pulley 34 and a Spring Clip held the Crank Handle in position.

Jib movement is controlled by a length of Cord tied to Rod 33 in the jib and wound around Rod 23 behind the cab. A brake for both this Rod and the  $5\frac{1}{2}$  in Crank Handle is formed by fitting a bolt in the bosses of the right-hand 1 in Pulleys on the Rod and Crank Handle. The bolt in the former engages with the head of a  $\frac{3}{8}$  in Bolt 36 fixed in one of the  $5\frac{1}{2}$  in Strips, and the bolt in the latter engages with the head of the bolt shown in the top illustration. Both the Rod and the Crank Handle should be free to move about a quarter of an inch in their bearings so that the boltheads can be engaged or disengaged by sliding the Rod or Handle one way or the other.

This completes construction of the major part of the crane, leaving only the wheeled base to be built. A

U-section Curved Plate and an ordinary  $2\frac{1}{2}$  in by  $2\frac{1}{2}$  in Curved Plate are bolted, one each end, to a  $5\frac{1}{2}$  in by  $2\frac{1}{2}$  in Flanged Plate 37, the same bolts also holding a  $2\frac{1}{2}$  in Stepped Curved Strip 38. Passed through the centre hole of the Flanged Plate is a 2 in Rod 39 that is held in position by a 3 in Pulley above the Plate and a 2 in Pulley beneath it. The Pulleys must hold Rod 39 as rigidly as possible while still allowing the Flanged Plate to swivel.

Four-inch Rods, journalled in the flanges of Plate 37, serve as axles, and they are kept in place by  $2\frac{1}{2}$  in Road Wheels. Finally, Rod 39 is inserted as far as possible into the boss of Pulley 5, bolted to the underside of the chassis, and the Set Screw in the boss is tightened against it.

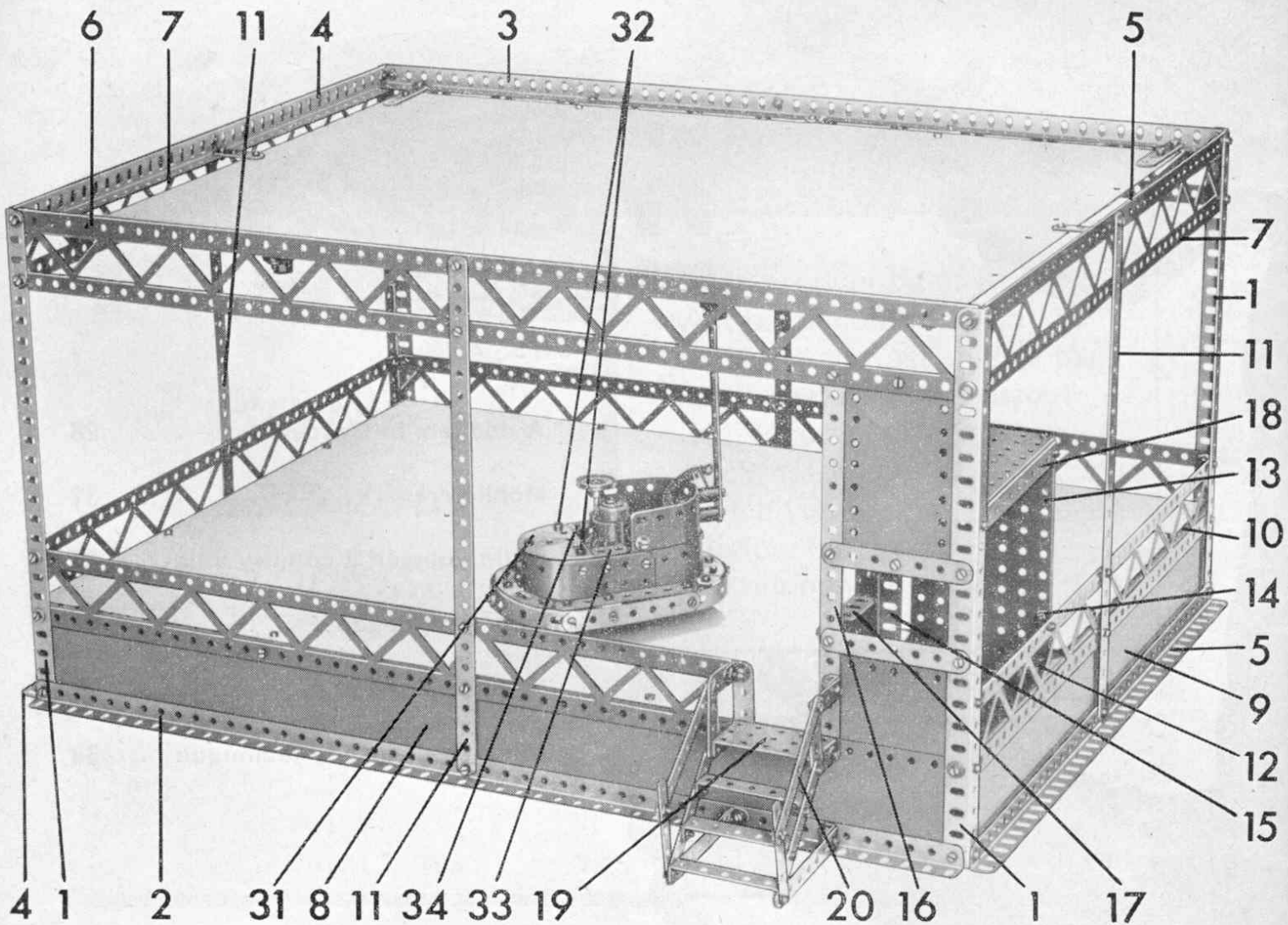
If when operating your model, you find it has a tendency to overbalance, the problem can be solved by fitting something heavy at the rear to act as a counterweight. The ideal place for such a weight would be inside one of the Curved Plates attached to the Flanged Plate 37 but, it is rather difficult to find an anchorage here. A suitable solution, therefore, is to bolt as many Strips as possible to the bottom edges of the  $4\frac{1}{2}$  in by  $2\frac{1}{2}$  in Flexible Plate which, together with Plate 6, forms the rear-side of the body.

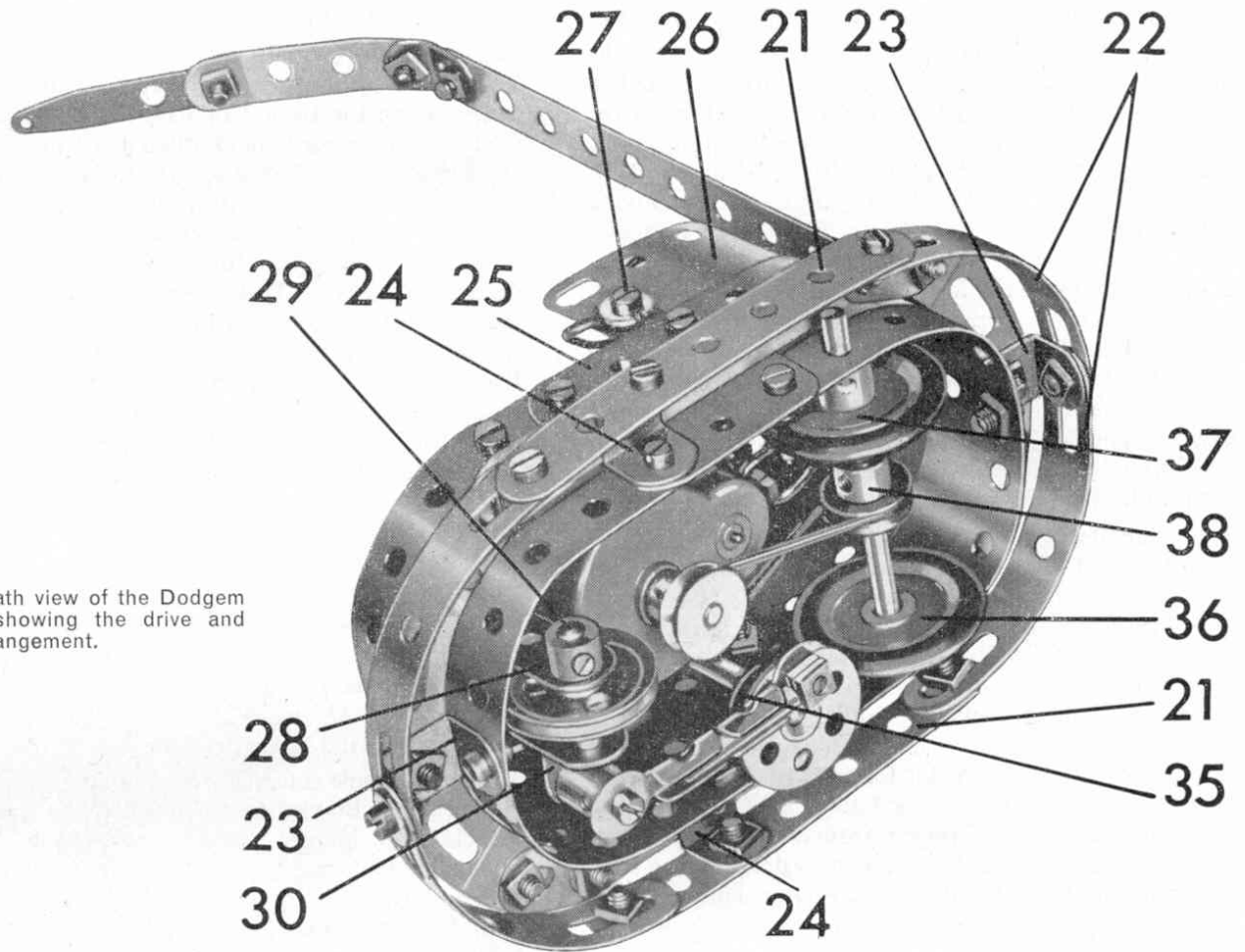
This, then, deals with the actual constructional details of the model. I would like to suggest, however, that after you have built it, you let your own designing abilities go to work. Modify it, Make improvements to the basic structure. Give your imagination a free hand! We often receive letters from readers pointing out that a particular section of a model I have featured could have been built in a stronger and more realistic way. This is quite true, and the interest shown by readers is most gratifying, but I do not presume to introduce any models as being the finest example of a particular construction. Some models are better than others yet, no doubt, *all* could be improved upon. Indeed, I wholeheartedly encourage modification as I know how much more fun is obtained from altering a model to suit your own ideas, once you have built it, than there is from following the step-by-step instructions and then leaving it at that. You will also find that, having had some experience of modifying existing models, your ability to build models entirely to your own designs is greatly increased.

**Parts required.**—4 of No. 1; 7 of No. 2; 2 of No. 3; 8 of No. 5; 2 of No. 11; 1 of No. 11a; 10 of No. 12; 2 of No. 15b; 2 of No. 16; 2 of No. 17; 2 of No. 18a; 1 of No. 18b; 1 of No. 19a; 2 of No. 19b; 1 of No. 20a; 3 of No. 22; 2 of No. 22a; 1 of No. 23; 1 of No. 24; 8 of No. 35; 87 of No. 37a; 76 of No. 37b; 14 of No. 38; 1 of No. 38d; 1 of No. 40; 1 of No. 48; 5 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 53a; 2 of No. 54; 1 of No. 57c; 2 of No. 90a; 1 of No. 111a; 5 of No. 111c; 2 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 176; 4 of No. 187; 2 of No. 188; 2 of No. 189; 2 of No. 190; 2 of No. 191; 1 of No. 193; 1 of No. 194; 1 of No. 199; 1 of No. 200; 1 of No. 213; 1 of No. 221.

# A 'Dodgem' in Meccano

The complete Dodgem Car and Track described in this article. Elektrikit parts enable power for the Emebo Motor in the car to be picked up in a realistic manner.





An underneath view of the Dodge Car itself, showing the drive and steering arrangement.

ALL OF us, at some time or another, have experienced the thrills and excitement of the fairground—either at a permanently sited, giant amusement park, or among the stalls of a small travelling fair. In these pages last month we featured a monster roundabout of the type found only at established amusement parks, but this month we have an attraction without which no fair would be complete, the Dodge. The floor and roof are made of sheet metal, obtainable from most hardware dealers, yet this can be replaced by a variety of other things. Tin foil attached to a sheet of cardboard makes a good—and cheap—substitute as also does small-aperture wire netting, or the fine gauze often found in food safes and fireguards.

As in the case of the roundabout described last month, this model has been devised to incorporate some Elektrikit parts.

The track housing is built up from a basic 'box' framework of Girders composed of two rectangles joined together at the corners by  $12\frac{1}{2}$  in Angle Girders 1. Each rectangle is made by joining together two  $24\frac{1}{2}$  in Angle Girders 2 and 3 with  $18\frac{1}{2}$  in Angle Girders 4 and 5. When the two rectangles are connected the two  $12\frac{1}{2}$  in Angle Girders 1 also hold in position, at the top, two  $24\frac{1}{2}$  in compound Braced Girders 6 and two compound  $18\frac{1}{2}$  in Braced Girders 7. The  $24\frac{1}{2}$  in lengths are made up from two  $12\frac{1}{2}$  in Braced Girders, whilst the  $18\frac{1}{2}$  in lengths

incorporate two  $9\frac{1}{2}$  in Braced Girders. At their other ends, Girders 1 have two  $24\frac{1}{2}$  in by  $2\frac{1}{2}$  in and two  $18\frac{1}{2}$  in by  $2\frac{1}{2}$  in compound Strip Plates 8 and 9 bolted to them. Plates 8 comprise two  $12\frac{1}{2}$  in by  $2\frac{1}{2}$  in Strip Plates, whereas Plates 9 are built up from two  $9\frac{1}{2}$  in by  $2\frac{1}{2}$  in Strip Plates. The upper bolts holding Plates 8 and 9 in place also hold a third  $24\frac{1}{2}$  in by  $18\frac{1}{2}$  in rectangle 10, constructed in a similar manner to the other two, in position. The horizontal flanges of the Angle Girders, used in this rectangle, are uppermost.

The whole framework is braced by four  $12\frac{1}{2}$  in Strips 11, and Braced Girders are bolted, as shown, to form handrails.

A  $3\frac{1}{2}$  in Flat Girder is attached to rectangle 10 by Bolt 12, this Bolt also helping to hold a  $5\frac{1}{2}$  in by  $3\frac{1}{2}$  in Flat Plate in position. The Flat Plate is bolted through its three remaining corners to the rectangle 10 and the Flat Girder. In addition, this last bolt fixes an Angle Bracket to the upper face of the Flat Plate.

The pay-box is now constructed, using the Flat Plate as the floor. Another  $5\frac{1}{2}$  in by  $3\frac{1}{2}$  in Flat Plate 13 is bolted to the Angle Bracket fixed to the Flat Plate forming the floor and to a further Angle Bracket 14 fixed to the handrail. The doorpost is a  $5\frac{1}{2}$  in Angle Girder 15 connected to an Angle Bracket bolted through the fifth hole from the end, along the edge of the floor Plate. A  $5\frac{1}{2}$  in by  $1\frac{1}{2}$  in Flexible Plate overlaid by a  $5\frac{1}{2}$  in Strip is fixed to

the Girder 15. Another  $9\frac{1}{2}$  in Angle Girder is bolted to the  $9\frac{1}{2}$  in Strip 16 connecting Braced Girder 6 and the middle rectangle of Girders. A  $3\frac{1}{2}$  in Strip is bolted to this Angle Girder and to Angle Girder 15 through the fifth holes from their lower ends. The resulting space beneath this Strip is filled in with a  $3\frac{1}{2}$  in by  $2\frac{1}{2}$  in Flexible Plate. A  $3\frac{1}{2}$  in Strip forms the remaining window frame and a small counter is added by bolting a  $1\frac{1}{2}$  in Angle Girder 17 to the horizontal  $3\frac{1}{2}$  in Strip. A final  $5\frac{1}{2}$  in Angle Girder 18 connects an Angle Bracket, bolted to Plate 13, to the Angle Girder 1 and a last  $5\frac{1}{2}$  in by  $3\frac{1}{2}$  in Flat Plate is fixed to this, and a corresponding Angle Girder at the other top corner of Plate 13, thus completing a roof. The remaining space between Angle Girder 1 and Strip 16 is covered by a  $3\frac{1}{2}$  in by  $2\frac{1}{2}$  in and a  $4\frac{1}{2}$  in by  $2\frac{1}{2}$  in Flexible Plate, except for a window that is edged by two  $3\frac{1}{2}$  in Strips, as shown.

The track itself is made of sheet metal or a suitable substitute, cut to size and bolted direct to the flanges of the Girders comprising the rectangle 10. The roof is also sheet metal, but it is cut so that it will fit inside the top rectangle of Girders without touching any of them. It is held in place by Insulating Strips and Insulating Fishplates from an Elektrikit outfit, so that, electrically speaking, it is completely isolated from the metal of the rest of the model. Elektrikit Lamp Holders also help to hold the rod in position and if Lamps are fitted in these, they will light up. If power from a battery is used, however, you may find that the Lamps drain this to such an extent that the car will not operate satisfactorily.

A set of steps is built, using a  $2\frac{1}{2}$  in by  $1\frac{1}{2}$  in Flanged Plate 19, four  $3\frac{1}{2}$  in Strips, three 2 in Strips, and two  $2\frac{1}{2}$  in Narrow Strips. Each handrail consists of a  $3\frac{1}{2}$  in Narrow Strip 20, and a  $1\frac{1}{2}$  in Strip joined to the model by an Angle Bracket. The Flanged Plate 19 is joined to the model, proper, by Angle Brackets, and the actual steps are  $2\frac{1}{2}$  in by  $\frac{1}{2}$  in Double Angle Strips.

Turning, now, to the car itself, the chassis, which also serves as a bumper, consists of two  $3\frac{1}{2}$  in Strips 21, joined at each end by two Formed Slotted Strips 22. Four Double Brackets 23 and 24 are bolted to the resulting oval, as shown. To the top of both Brackets 23, a 3 in Stepped Curved Strip is fixed, and to the top of both Brackets 24, a  $3\frac{1}{2}$  in Strip is bolted through the third hole. The Strips and Curved Strips are joined by Fishplates.

Another oval is formed by bolting two  $5\frac{1}{2}$  in by  $1\frac{1}{2}$  in Flexible Plates and two  $1\frac{1}{2}$  in by  $1\frac{1}{2}$  in Flat Plates 25 to the free, inside lugs of the Double Brackets. The back, a further  $5\frac{1}{2}$  in by  $1\frac{1}{2}$  in Flexible Plate 26, is then fixed in place and is strengthened by a  $2\frac{1}{2}$  in by  $\frac{1}{2}$  in Double Angle Strip held by Bolt 27 to each side. A 1 in by  $\frac{1}{2}$  in Angle Bracket is bolted to the front Flexible Plate, the bolt passing through the centre hole of the Plate, and the smaller lug of the Angle Bracket. A 1 in by  $\frac{1}{2}$  in Double Bracket 28 is lock-nutted through the outer hole in the larger lug of this Angle Bracket and a 1 in Rod 29, carrying a 1 in loose Pulley, is journalled in the end holes of its lugs. The Pulley, positioned between the lugs, is held in place by two Collars. An Angle Bracket 30, with a Threaded Boss attached to one lug, is bolted to the

right-hand lug of Double Bracket 28. A Rod and Strip Connector is pivotally fitted to the other end of the Threaded Boss and this is joined to a further Rod and Strip Connector by a 1 in Rod. This Rod and Strip Connector is, in turn, lock-nutted to a 1 in diameter Bush Wheel (Elektrikit Part No. 518) fitted on the end of a  $2\frac{1}{2}$  in Rod forming the steering column. Three Angle Brackets are bolted to the front  $5\frac{1}{2}$  in by  $1\frac{1}{2}$  in Double Angle Strip and these form the supports for a Semi-Circular Plate 31. The rear two Bolts 32 holding this Plate in position also hold  $1\frac{1}{2}$  in Strips 33 and 34 between the lugs of the Angle Brackets and the Semi-Circular Plate. The Strips point rearwards with the Bolts passing through their first holes. The steering column is journalled in the last hole of Strip 34 and in an Angle Bracket 35, attached to the side of the car. It is held by a Collar at the top whilst the steering wheel is a 1 in Pulley with boss.

A 3 in Rod carrying two 1 in Pulleys with Rubber Rings 36 and 37, and a  $\frac{1}{2}$  in fixed Pulley 38, forms the rear axle. Pulley 36 is fixed on the Rod, but 37 is loose, being held against the side by a Collar. An Emebo Motor is bolted, as shown, to the Double Angle Strip held by Bolts 27 and a  $2\frac{1}{2}$  in Driving Band connects a  $\frac{1}{2}$  in Pulley on the Motor to Pulley 38 on the rear axle.

The pick-up pole consists of a  $5\frac{1}{2}$  in Strip extended by an Obtuse Angle Bracket to which is bolted a 2 in laminated flexible strip, in turn extended by a  $1\frac{1}{2}$  in Wiper Arm (Elektrikit Part No. 532). The laminated strip is built up from two 2 in Flexible Strips (Elektrikit Part No. 530). Two Insulating Spacers (Elektrikit Part No. 564) are bolted through the bottom two holes of the  $5\frac{1}{2}$  in Strip, and these are attached to the  $5\frac{1}{2}$  in by  $1\frac{1}{2}$  in Flexible Plate 26 by another two bolts.

One Motor lead is taken to one of the bolts fixing the  $5\frac{1}{2}$  in Strip to the Insulating Spacer, care being taken that no electrical contact is made with the car proper. The other lead is 'earthed', i.e., an electrical contact is made with the car. In our model this lead is taken to Bolt 27. Before making any connections, however, it is best to coil the loose wire, as shown in the main illustration, to save space.

**Parts required.**—4 of No. 1; 1 of No. 1a; 1 of No. 2; 12 of No. 3; 3 of No. 6; 4 of No. 6a; 6 of No. 7; 6 of No. 7a; 4 of No. 8; 4 of No. 9; 1 of No. 9f; 4 of No. 10; 4 of No. 11; 1 of No. 11a; 16 of No. 12; 1 of No. 12b; 1 of No. 12c; 1 of No. 16a; 1 of No. 16b; 2 of No. 18b; 3 of No. 22; 1 of No. 22a; 1 of No. 23a; 194 of No. 37a; 182 of No. 37b; 25 of No. 38; 4 of No. 48a; 1 of No. 51; 3 of No. 52a; 4 of No. 59; 1 of No. 64; 2 of No. 74; 2 of No. 89a; 7 of No. 99; 8 of No. 99a; 1 of No. 99b; 1 of No. 103c; 17 of No. 111c; 2 of No. 135; 1 of No. 186; 4 of No. 189; 2 of No. 190a; 1 of No. 191; 1 of No. 193b; 4 of No. 196; 4 of No. 197; 2 of No. 212; 1 of No. 214; 4 of No. 215; 2 of No. 235; 2 of No. 235b; 2 of No. 502; 2 of No. 503; 2 of No. 513; 1 of No. 518; 2 of No. 530; 1 of No. 532; 4 of No. 539; 2 of No. 564; 1 Emebo Motor.