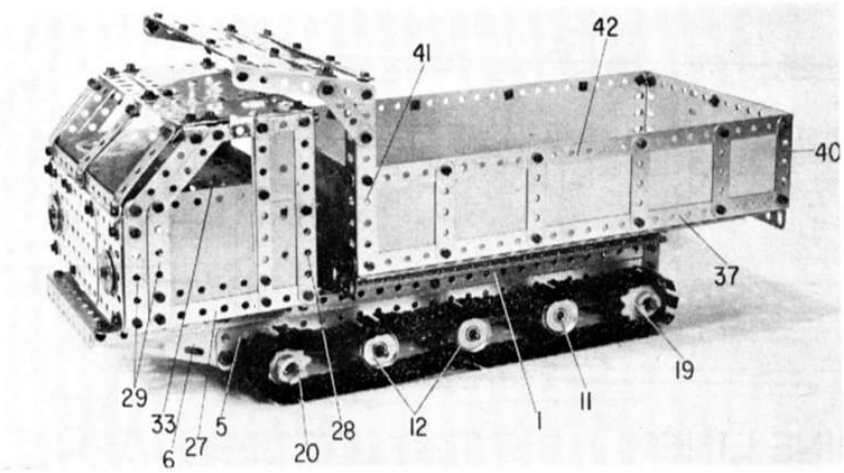
A caterpillar-track cross-country vehicle based on the full-size Flextrac-Nodwell FN110



Making use of the Meccano Caterpillar Track Pack, this ruggedly appealing model follows the layout of the Flextrac Nodwell type FN110 vehicle, which can take almost any surface in its stride.

Tracked for Tough Terrain

SAYS 'SPANNER' OF THIS ADVANCED MODEL

SLEEK, intricate and streamlined models are very appealing in their place, and I am among the first to appreciate them, but now and again I really do like to see a big, chunky, "monster". Some people might regard such models as ugly, yet I often think they have their own particular beauty—in an aura of brute strength and power!

Featured here is a model which undoubtedly falls into the latter category. Tracked for tough terrain, it is based on a Flextrac-Nodwell type FN110—a rugged cross-country vehicle designed to carry loads over the worst kind of ground from rocky wastelands to muddy swamps, or treacherous ice-fields. The real thing, in fact, will climb gradients in excess of 60 degrees and can manage a 30 degree side-tilt without any trouble. It can be fitted with various tracks to meet "any conditions" and already has an impressive record of operational successes in many countries behind it to prove its capabilities.

From the Meccano modeller's point of view it is an ideal vehicle, not only because its rugged shape lends itself perfectly to reproduction in Meccano, but also because its tracked characteristic offers an excellent opportunity for using Meccano Caterpillar Track Pack. Needless to say, this is what our model-builder has done—with very realistic results. The model runs well and also incorporates working steering, controlled by a steering wheel instead of the more usual lever-steering found on most tracked vehicles. We do not know the system used on the real FN110, by the way, but the average tracked vehicle is steered by braking one or other track, while allowing the non-braked track to drive the vehicle round. Our system relies on a simple but effective gearing system, as will be seen.

Chassis

The chassis is built up from two 15½ in. compound angle girders 1, each consisting of a 12½ in. and a 4½ in. Angle Girder. These compound girders are connected together at their forward ends by a 4½ in. Angle Girder and, at their rear ends, by a 3½ × 2 in. Double Angle Strip 2, each securing Bolt in the latter case also holding a 1½ in. Strip 3 in position. Bolted between Strips 3 at each side are two further 3½ × ½ in. Double Angle Strips 4, the securing Bolts also fixing a 12½ in. Flat Girder 5 in place. The forward ends of Girders 5 are connected by another 3½ × ½ in. Double Angle Strip, each securing Bolt in this case helping to hold in place a 3½ × 1½ in. Triangular Flexible Plate 6 which is also bolted to compound girder 1. Counting from the rear end, Flat Girders 5 are further connected through their sixth, ninth, fourteenth and sixteenth holes by four more 3½ × ½ in. Double Angle Strips, arranged as shown and numbered 7, 8, 9 and 10 respectively. Note that the Bolts fixing Double Angle Strips 7 and 8 in place also fix a Double Bent Strip to the outside of each Flat Girder, while the Bolts securing Double Angle Strip 9 help to fix a strengthening 1½ in. Strip between the insides of the Flat Girder and compound girder 1 at each side. Held by Collars in the Double Bent Strip and the Flat Girder is a free-turning 2 in. Rod carrying a 1 in. Pulley 11 which will serve as an "idler" wheel for the tracks. Further idlers are provided by additional 1 in. Pulleys 12, fixed on two 6 in. Rods journalled in Flat Girders 5.

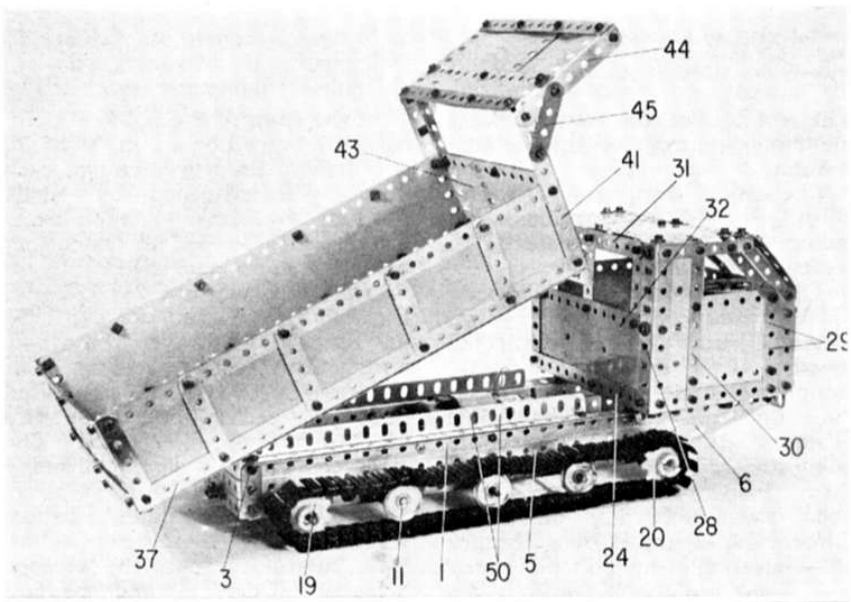
Now bolted to Double Angle Strips 9 and 10 is a Motor-with-Gearbox, output shaft rearwards and set in the 60:1 ratio. A 1½ in. Strip 13 is added to the shaft, followed by a ¾ × ¾ in. Pinion. This Pinion is in constant mesh with a 50-teeth Gear Wheel 14 fixed on a 6½ in. Rod, free to slide in the centre holes of Double Angle Strips 7 and 8 and lower Double Angle Strip 4, as well as in the lower hole in Strip 13. Stops to prevent the Rod sliding so much that Gear 14 disengages with the ¾ × ¾ in. Pinion are supplied by two Collars, one fixed on the rear end of the rod and the other between Double

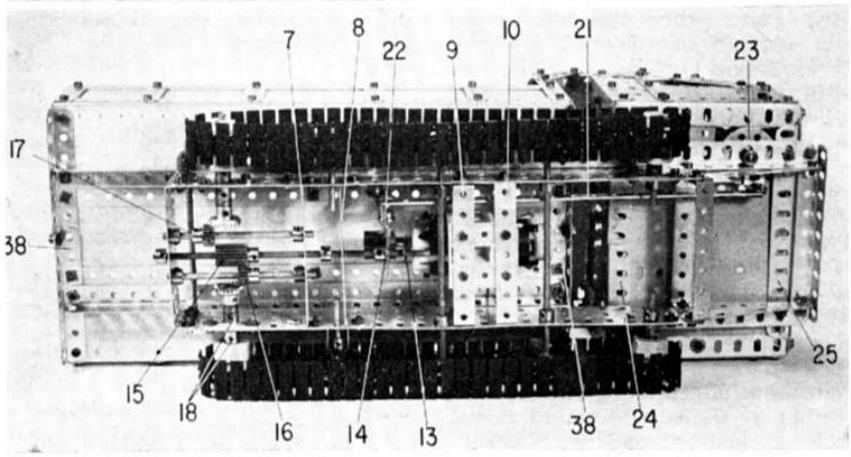
Angle Strips 7 and 8. Also fixed on the Rod in the position shown is ½ × ¾ in. Pinion 15.

Two 3½ in. Rods are next held by Collars in lower Double Angle Strip 4 and Double Angle Strip 7 one each side of the 6½ in. Rod. Two ½ in. Pinions 16 and 17 are secured one on each of these Rods, care being taken with their positioning. They should be staggered in relation to each other so that with the 6½ in. Rod in its forward position, Pinion 15 meshes only with Pinion 16. As the Rod moves rearward to the centre position, however, Pinion 15, remaining in mesh with Pinion 16, should also mesh with Pinion 17. As the Rod moves further back to its rear position, Pinion 15 should disengage Pinion 16 and mesh only with Pinion 17. Pinions 16 and 17 each mesh with a ¾ in. Contrate Wheel fixed on a 2½ in. Rod journalled in the bosses of two Double Arm Cranks 18 bolted one to the inside and one to the outside of Flat Girder 5. Packing Washers are added as necessary. Mounted on the Rod is a Coupling on which a Plastic Meccano 10-teeth Sprocket Wheel 19 from the Track Pack, is secured. A similar Sprocket 20 is fixed on another Coupling mounted on a 2 in. Rod journalled in one Double Arm Crank bolted towards the opposite end of Flat Girder 5 and held in place by a Collar.

Lengths of caterpillar track will of course be carried on the Plastic Meccano Sprockets but before fitting them it is advisable to complete the steering linkage. Turning freely on a Pivot Bolt locked in the tenth hole of compound girder 1 is a Crank to the lower end of the arm of which a 9½ in. Strip 21 is pivotally attached by a ½ in. Bolt. Fixed on the shank of this Bolt is an End Bearing 22, the arms of which locate over the face of Gear Wheel 14, but note that the arms must not grip the Gear, or hinder its turning movement in any way. The forward end of Strip 21 is lock-nutted to an Angle Bracket which is in turn lock-nutted to an 8-hole Bush Wheel 23 fixed on the steering column. This column is supplied by a 3½ in. Rod journalled in the fourth hole of compound girder 1 and—later—in a journal mounted inside the cab. When the steering wheel is turned, it causes End Bearing 22 to act on Gear 14 moving it and its supporting Rod backwards or forwards which, of course, controls the meshing of Pinions 15, 16 and 17. This, in turn, causes the model to steer in the chosen direction.

The two crawler tracks can be positioned as soon as the control linkage has been completed. Each track consists of 63 Track Links, which is just right to ensure sufficient slack for easy running without being so loose that the track is easily "thrown".



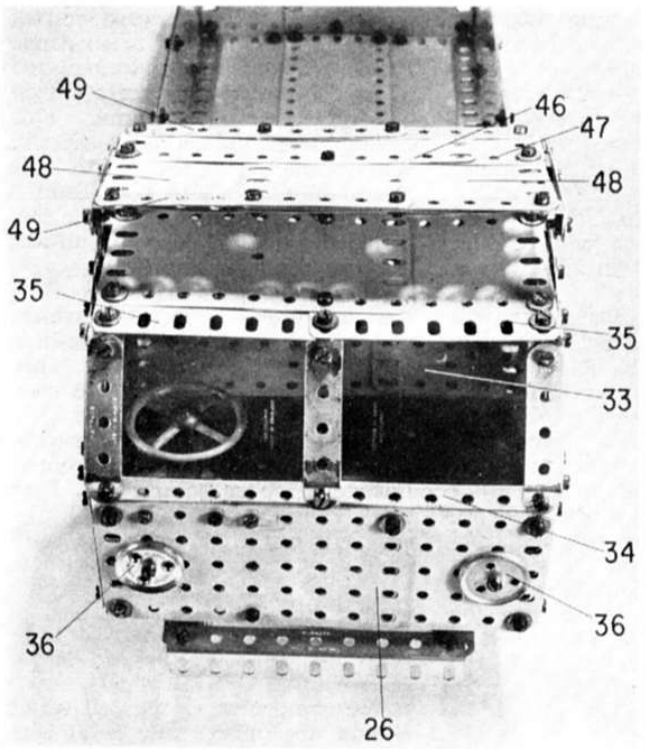


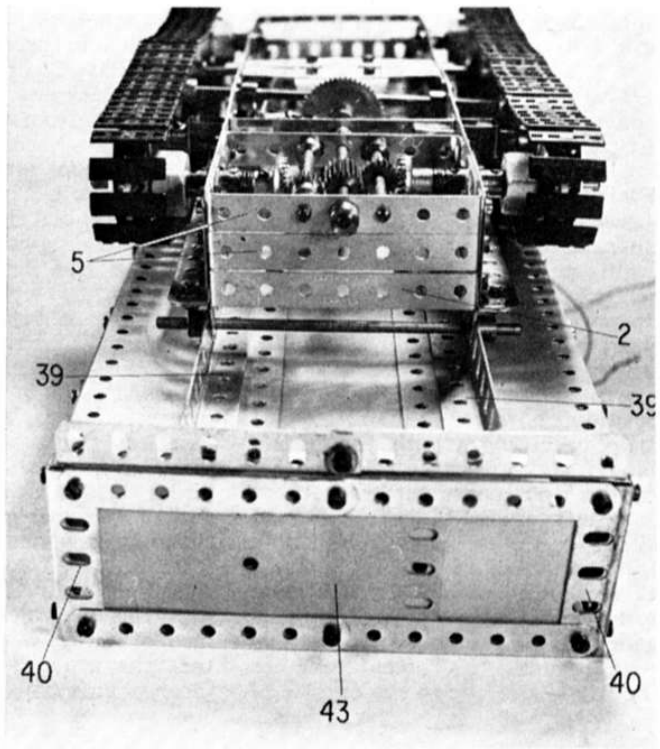
Top, a general three-quarter rear view of the model, with the load body in the raised position. Left, an underside view of the model showing the drive to the tracks.

Cab

We come next to the cab which should not present any great constructional difficulties. A 6½ in. compound angle girder 24 (built up from one 4½ in. and one 3½ in. Angle Girder) and a 5½ in. Angle Girder 25 are attached to compound girders 1, being spaced from the girders by two Washers and a Nut on each securing ½ in. Bolt. A 6½ × 2½ in. compound flat plate 26 built up from two 4½ × 2½ in. Flat Plates and edged by 2½ in. Angle Girders is bolted to the vertical flange of Girder 25. The lower end of each 2½ in. Girder is then connected to the end of compound girder 24 by a 4½ in. Angle Girder 27, a rear vertical corner post being provided by another 4½ in. Angle Girder 28. Two 3 in. Strips 29, extended upwards and rearwards by 2½ in. Narrow Strips, are bolted to the forward end of Girder 27, the upper ends of the Narrow Strips being connected to the top of Girder 28 by a 3 in. Narrow Strip. The end securing Bolts also hold two Angle Brackets in place. A 4½ in. Narrow Strip 30 is bolted between the 3 in. Narrow Strip and Angle Girder 27, then the cab side is completed by a 4½ × 2½ in. and two 2½ × 1½ in. Flexible Plates arranged as shown to leave a gap for the side window.

At the back of the cab, a 2½ in.





Left, a high frontal view of the cab, in close-up. Right, in this close-up underside rear view of the model, the Double Angle Strip connections between the sides of the chassis are clearly shown.

Flat Girder is bolted to the upper half of each Girder 28, these Flat Girders being connected at the top by a 5½ in. Strip 31 and, at the bottom, by a 5½ in. Angle Girder, the securing Bolts in the latter case helping to fix a 6½ × 2½ in. compound flexible plate 32 between Angle Girders 28. The centre of the Angle Girder is connected to the centre of Strip 31 by a 2½ in. Strip, while a 5½ × 1½ in. Flexible Plate 33, extended two holes by a 2½ × 1½ in. Flexible Plate is bolted to the horizontal flange of the Girder to represent the seat.

A 6½ in. compound strip 34, built up from two 3½ in. Strips, is attached by Fishplates to compound plate 26, at the same time fixing in position two 3½ × 2½ in. Transparent Plastic Plates overlaid by three 2½ in. Strips to serve as the windscreen. The Strips and Plates are carefully bent to the required shape, then the roof is added, this consisting of two 4½ × 2½ in. Flexible Plates, overlapped five holes, and two 3½ in. Flat Girders 35. The roof as a whole is attached to the sides by the earlier-mentioned Angle Brackets with the windscreen being secured to Flat Girders 35, by Angle Brackets.

A Trunnion is bolted to the inside top edge of compound plate 26, the apex of this Trunnion being extended one hole by a 1½ in. Strip. The end hole of this Strip provides the upper journal for the steering column.

The cab is completed with two 1 in. Pulleys without boss 36, bolted to the front of plate 26 to serve as headlamps.

This leaves only the load body to be produced. Two 12½ in. Angle Girders 37 are connected together at the ends by two 6½ in. compound angle girders 38 (each built up from two 3½ in. Angle Girders), the intervening space being enclosed by three 12½ × 2½ in. Strip Plates forming the lorry bed. Two more 12½ in. Angle Girders 39, separated by a distance of five clear holes, are bolted between compound girders 38 beneath the Strip Plates, then attached to the rear corners of the bed are two 2½ in. Angle Girders 40, while two 4½ in. Angle Girders 41 are attached to the forward corners. Bolted to Girders 37, 40 and 41 at each side is another 12½ × 2½ in. Strip Plate, serving as the body side and edged along the top by a 12½ in. Strip 42. This Strip is connected to Girder 37 by four 2½ in. Strips spaced as shown. The back and front are both enclosed by a 6½ × 2½ in. compound flexible Plate 43, built up from two 4½ × 2½ in. Flexible Plates and edged along the top and bottom by 6½ in. compound strips, each supplied by two 3½ in. Strips.

At the front of the body a 3½ in. Strip 44, braced by a 2 in. Strip 45, is bolted to the upper end of each Girder 41. Attached by Angle Brackets to Strips 44 is an overhanging 6½ × 3½ in. extension, built up from one 5½ × 1½ in Flexible Plate 46, one 2½ × 1½ in. Flexible Plate 47 and two 4½ × 2½ in. Flexible Plates 48, the whole arrangement being edged at front and rear by two 6½ in. compound Strip 49, each supplied by two overlapping 4½ in. Strips. The completed body is finally pivotally attached to two 9½ in. Angle Girders 50—bolted to compound girders 1 in the chassis—by means of a 5 in. Rod passed through the seventh holes of Girders 39 and the end holes of Girders 50. It is held in place by Collars.

PARTS REQUIRED

1—1a	3—12c	2—29	5—111a
1—2a	1—14	211—37a	1—126
4—2a	2—14a	191—37b	1—147b
10—3	1—15	60—38	1—166
4—4	1—15b	2—45	1—185
12—5	2—16	9—48b	6—188
2—6	2—16a	2—53a	2—189
6—6a	4—17	19—59	2—190a
6—8	6—22	1—62	13—191
2—8a	2—22a	6—22b	2—193b
2—9	1—24	4—63	5—197
10—9a	1—25b	10—69c	2—224
5—9b	2—26	2—103b	4—235
4—9d	1—26b	4—103d	2—235a
9—12	1—27	2—103f	2—235d

4—10-teeth Sprockets (Plastic Part No. P1)
126—Track Links
1—3-12 volt Motor-with-gearbox.