

THE GMM SERIES OF MODERN SUPERMODELS

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# American Army Jeep

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*This is the first model of the well-known jeep of World War II, other than a few minor models in various Liverpool publications.*

*It is not a complex model, but is of pleasing outline and well within the scope of most Meccano enthusiasts, even those with small stocks of parts.*

*The designer was Sr. D. Eduardo R. Oropeza, of Querétaro, Mexico.*

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## AMERICAN ARMY JEEP

### 1. THE PROTOTYPE

The word "Jeep" was the popular name for the U.S. Army's  $\frac{1}{2}$ -ton truck widely used during World War II, and the registered trade mark of Willys Motors Inc. No really satisfactory explanation of the origin of the term has ever been given; some have related it to a comic strip character created by E. C. Segar and others to a slurring of the letters GP (General Purpose).

The jeep was developed originally as a fast military reconnaissance car to replace the motorcycle. It was the smallest of the U.S. Army's trucks in World War II - only about 11 feet/3,4 m long and 4 feet/1,22 m high - but it had remarkable power, stamina and manoeuvrability. It could haul troops, ammunition or light cargo, tow aircraft or small artillery pieces and, with special fittings, serve as an ambulance, fire-fighting vehicle, mobile machine-gun mount, or radio patrol car. The jeep could cross bridges too weak to support other motorized equipment and could easily be transported by air. The secret of its ground mobility lay in its light weight (between 2200-2500 lb/1000-1137 kg, depending on the model), its four-wheel drive and powerful four-cylinder petrol engine. Its top highway speed was 60 mile/hr (96 km/hr).

Development of the jeep began in the 1930's as part of a broad programme for motorization of the U.S. Army. The first successful pilot model was built by the American Bantam Car Company in 1940. A model submitted by the Willys-Overland Company was officially adopted by the U.S. Army in August 1941. Production of jeeps during World War II by Willys-Overland and the Ford Motor Company totalled 654,569.

In 1941 work went forward on development of an amphibian jeep for use in landing operations. A successful amphibian jeep resulted, but it was not widely used because of its small size. It could not compete with the larger  $2\frac{1}{2}$ -ton amphibian truck known as the DUKW, that soon gained worldwide fame, nearly rivaling that of the jeep itself.

### 2. THE MODEL

It is strange that only small models of jeeps have been published by Meccano Ltd. Elementary models appeared in MM 9.48, 3.56, 11.56 and 2.62; Model 4.13 in the 1954-51 series of manuals was also an elementary jeep.

The model described in this Leaflet does not reproduce all the features of the prototype; for example, the drive is to the rear wheels only, instead of to all four wheels as in the prototype.

The scale is about one-tenth natural size.

### 3. CONSTRUCTION

#### 3.1 Chassis

The chassis frame is shown in Fig. 1; it consists of two  $5\frac{1}{2}$ " angle girders 1 and 2 joined to two similar girders 3 and 4 by two  $3\frac{1}{2}$ " strips 5 and 6 and two  $2\frac{1}{2}$ " strips 7 and 8, four obtuse angle brackets being used to join the  $2\frac{1}{2}$ " strips 7 and 8 to girders 1, 2, 3 and 4. A  $5\frac{1}{2}$ " x  $\frac{1}{2}$ " double angle strip 9 and a  $5\frac{1}{2}$ " strip 10 are fixed to the angle girders with  $\frac{1}{2}$ " x  $\frac{1}{2}$ " angle brackets, as shown.

Four slightly curved  $3\frac{1}{2}$ " strips 11, 12, 13 and 14 form the springs

they are attached to the angle girders by fishplates 15 and  $\frac{1}{2}$ " x  $\frac{1}{2}$ " angle brackets 16. Exceptionally, the fishplates are omitted at 17 and 18, angle brackets only being used.

A  $4\frac{1}{2}$ " strip 19 is bolted to the front springs as shown and a  $3\frac{1}{2}$ " strip 20 is bolted to the rear springs ; a  $\frac{1}{2}$ " x  $\frac{1}{2}$ " angle bracket 21 is bolted to the centre hole of the strip 20. A  $3\frac{1}{2}$ " x  $\frac{1}{2}$ " double angle strip 22 is fixed by bolt 23 and a similar bolt on the other side, while a  $2\frac{1}{2}$ " x  $\frac{1}{2}$ " double angle strip 24 is held by bolt 25 and a similar bolt on the opposite side.

### 3.2 Gear Box and Transmission

An E15R or E20R electric motor is bolted across girders 1 and 2, two of the fixing nuts and bolts being indicated at 26 and 27 in Fig. 2, which shows the underside of the completed chassis. A  $\frac{1}{2}$ " pinion 28 on the armature shaft meshes with a 57-tooth gear 29 on a  $2\frac{1}{2}$ " rod journalled in the motor side plates. This rod carries a worm (rod and worm are not shown in Fig. 2), which engages a  $\frac{1}{2}$ " pinion 30 on a  $3\frac{1}{2}$ " rod 31 journalled in two flat trunnions bolted to the double angle strips 22 and 24 by bolts 32 and 33. Rod 31 also carries a  $\frac{1}{2}$ " pinion 34, a collar 35 and a  $\frac{1}{4}$ " pinion 36 ; the rod is slidable and its movement is limited by the collar 37 and pinion 30.

A  $3\frac{1}{2}$ " rod 38 is journalled in the double angle strips 22 and 24, passing also through the flat trunnions already mentioned. Rod 38 carries a retaining collar 39, a 57-tooth gear 40, a 50-tooth gear 41 and a universal coupling 42. Gear 40 meshes with pinion 34 and gear 41 with pinion 36, according to the position of the sliding rod 31. The movement of rod 31 is controlled by a lever shown in Fig. 3, which is natural size ; the construction is easily seen from this - 43 is a fishplate bolted to the collar 44. The fishplate 43 is placed between the collar 35 and pinion 34, washers being used for spacing. The lever itself pivots on a  $\frac{1}{2}$ " rod 45 fixed in the lower hole of coupling 46 ; rod 45 is journalled in strip 7 and a  $\frac{1}{2}$ " x  $\frac{1}{2}$ " angle bracket 47 bolted to strip 5.

A 2" rod 48 is fixed in the universal coupling 42 and passed through the  $\frac{1}{2}$ " x  $\frac{1}{2}$ " angle bracket 21 (Fig. 1). Rod 48 carries a  $1\frac{1}{2}$ " contrate wheel 49 which meshes with a  $\frac{1}{2}$ " pinion 50 on the rear axle which is a 4" rod 51 joined to a 2" rod (not seen) by a coupling 52. The rear axle is journalled in the  $\frac{1}{2}$ " x  $\frac{1}{2}$ " angle brackets 53 and 54 (Fig. 1), collars and washers being used for retention of the rod. The wheels are  $2\frac{1}{2}$ " diameter road wheels. There is no differential, nor is a clutch provided.

### 3.3 Front Axle and Steering

Each stub axle 55 is a 2" rod journalled in a double bracket 56 which is locknuted to strip 19 as shown in Fig. 2, a  $1\frac{1}{2}$ " strip 57 also being retained inside the double bracket. The track rod is a  $3\frac{1}{2}$ " axle rod 58 which is connected to the  $1\frac{1}{2}$ " strips 57 by means of rod and strip connectors 59.

A bell crank with boss 60 is pivotally attached in the centre hole of strip 19 by a  $\frac{3}{4}$ " bolt and lock nuts ; a  $\frac{1}{2}$ " bolt 61 fixed in the bell crank is also held in a collar 62 fixed to the track rod. A rod and strip connector 63 holds a  $1\frac{1}{2}$ " rod carrying a small fork piece 64 ; in the jaws of the fork piece is a coupling 65 joined by a 1" rod to a second coupling 66. Coupling 66 is fixed on the 4" rod 67 (retained by collars) on the other end of which is a  $1\frac{1}{2}$ " contrate wheel 68.

The steering wheel is fixed on a  $4\frac{1}{2}$ " rod journalled in a  $1\frac{1}{2}$ " x  $\frac{1}{2}$ "

double angle strip 69 (Fig. 1) held by two  $1\frac{1}{2}$ " strips as shown, strip 70 being fixed to strip 6 by a  $\frac{1}{2}$ " x  $\frac{1}{2}$ " angle bracket 71. The lower end of the  $4\frac{1}{2}$ " rod carries a  $\frac{1}{2}$ " pinion meshing with the contrate 68.

### 3.4 Motor Control

This is seen in Fig. 4 which shows the motor viewed from the front; a  $1\frac{1}{2}$ " strip 72 is locknuttet to one arm of the motor switchplate as shown. The other end of strip 72 is locknuttet to a 2" strip 73 bolted to a crank 74 which is fixed on a  $6\frac{1}{2}$ " rod journalled in two  $\frac{1}{2}$ " x  $\frac{1}{2}$ " angle brackets bolted to the corner holes of the motor side plate. The rod carries a second crank 75 fitted with a short threaded pin 76 to act as a control - it extends behind the dashboard.

### 3.5 Body

This is made in one piece and is shown in Fig. 5. Construction will easily be followed from the illustration, but the following points need explanation. The seat is a  $5\frac{1}{2}$ " x  $2\frac{1}{2}$ " flexible plate 77 and the back is a  $5\frac{1}{2}$ " x  $2\frac{1}{2}$ " flat plate 78. Plates 79 are  $2\frac{1}{2}$ " x  $2\frac{1}{2}$ " triangular plates, while plates 80 are  $2\frac{1}{2}$ " x 2" triangular plates. Strips 81 are  $2\frac{1}{2}$ " and strips 82 are  $3\frac{1}{2}$ ", two 1" x  $\frac{1}{2}$ " angle brackets being used at 83 and 84 to hold them together.

The radiator grille is made from three 4" rods 85 retained by collars between three pairs of fishplates bolted to the 2" strips 86.

The body is bolted to the chassis at the rear by two nuts and bolts through the lower flange of the  $5\frac{1}{2}$ " x  $2\frac{1}{2}$ " flanged plate 87 and holes 88, and at the front by two  $\frac{1}{2}$ " x  $\frac{1}{2}$ " reversed angle brackets held by bolts 89, the brackets being bolted to the  $1\frac{1}{2}$ " strips 90, see Figs. 1 and 5.

## 4. LIST OF PARTS REQUIRED

7	x	2	3	x	16	2	x	48b	1	x	128
7	x	2a	1	x	16a	4	x	48c	1	x	140
8	x	3	5	x	17	1	x	52	1	x	185
4	x	4	2	x	18a	1	x	53	4	x	187
9	x	5	3	x	18b	23	x	59	6	x	188
5	x	6	1	x	25	2	x	62	2	x	189
8	x	6a	5	x	26	6	x	63	1	x	190a
4	x	9	1	x	27	1	x	70	1	x	192
19	x	10	2	x	27a	6	x	90a	3	x	212
2	x	11	2	x	28	2	x	111	2	x	222
37	x	12	1	x	32	1	x	111a	2	x	223
4	x	12b	185	x	37a	3	x	111c	1	x	E15R
6	x	12c	170	x	37b	1	x	115			or E20R
1	x	14	49	x	38	1	x	116a	2	x	shoulder
1	x	15a	1	x	48	2	x	125			bolts from
5	x	15b	1	x	48a	2	x	126a			140

## 5. ACKNOWLEDGEMENTS

The information on the prototype in Section 4 is from the Encyclopaedia Britannica.



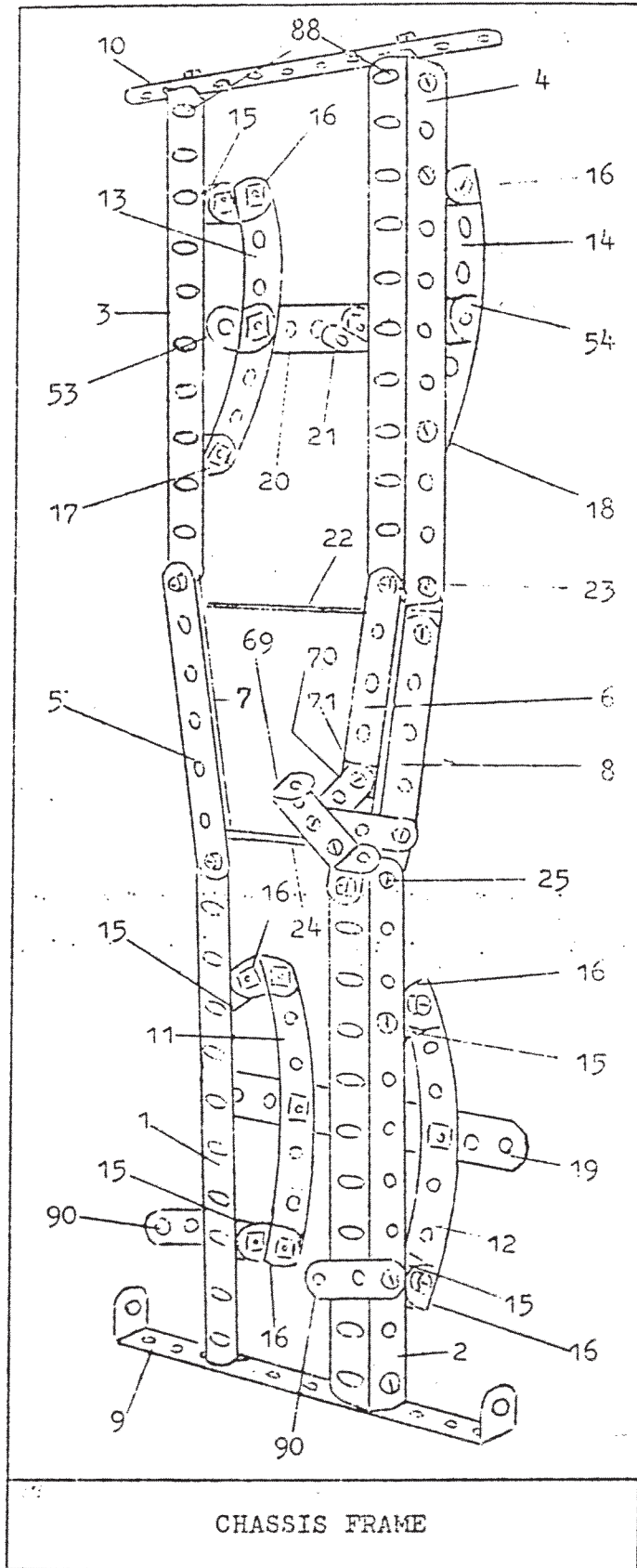
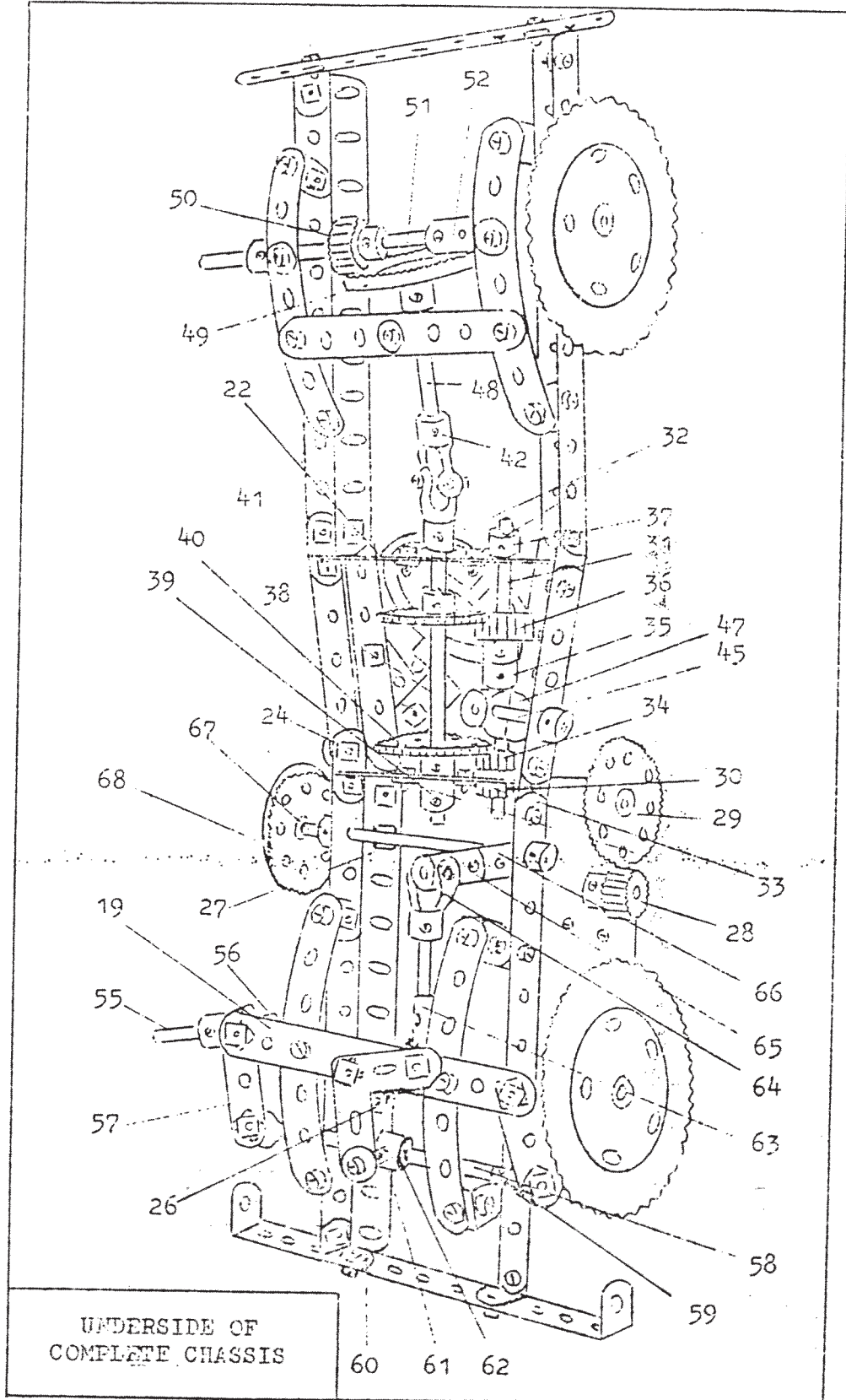
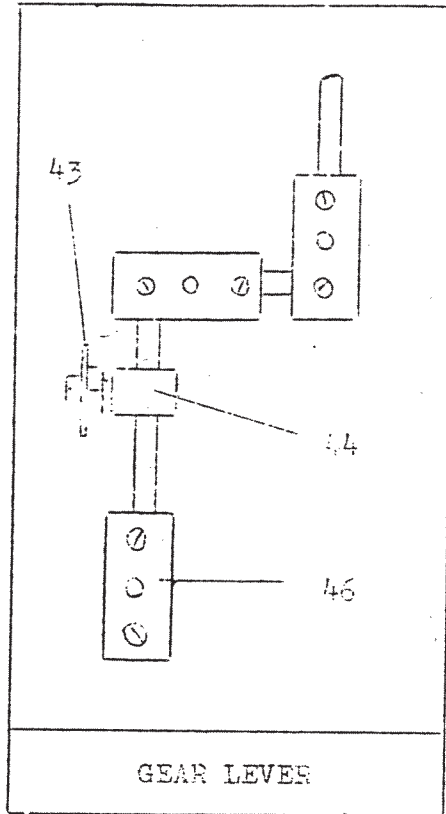


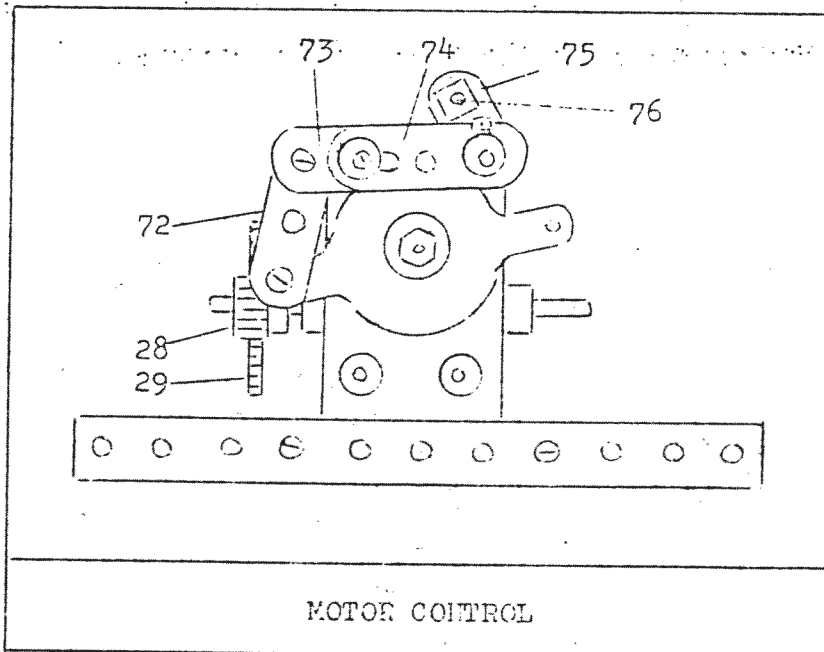
Figure 1





GEAR LEVER

Figure 3



MOTOR CONTROL

Figure 4

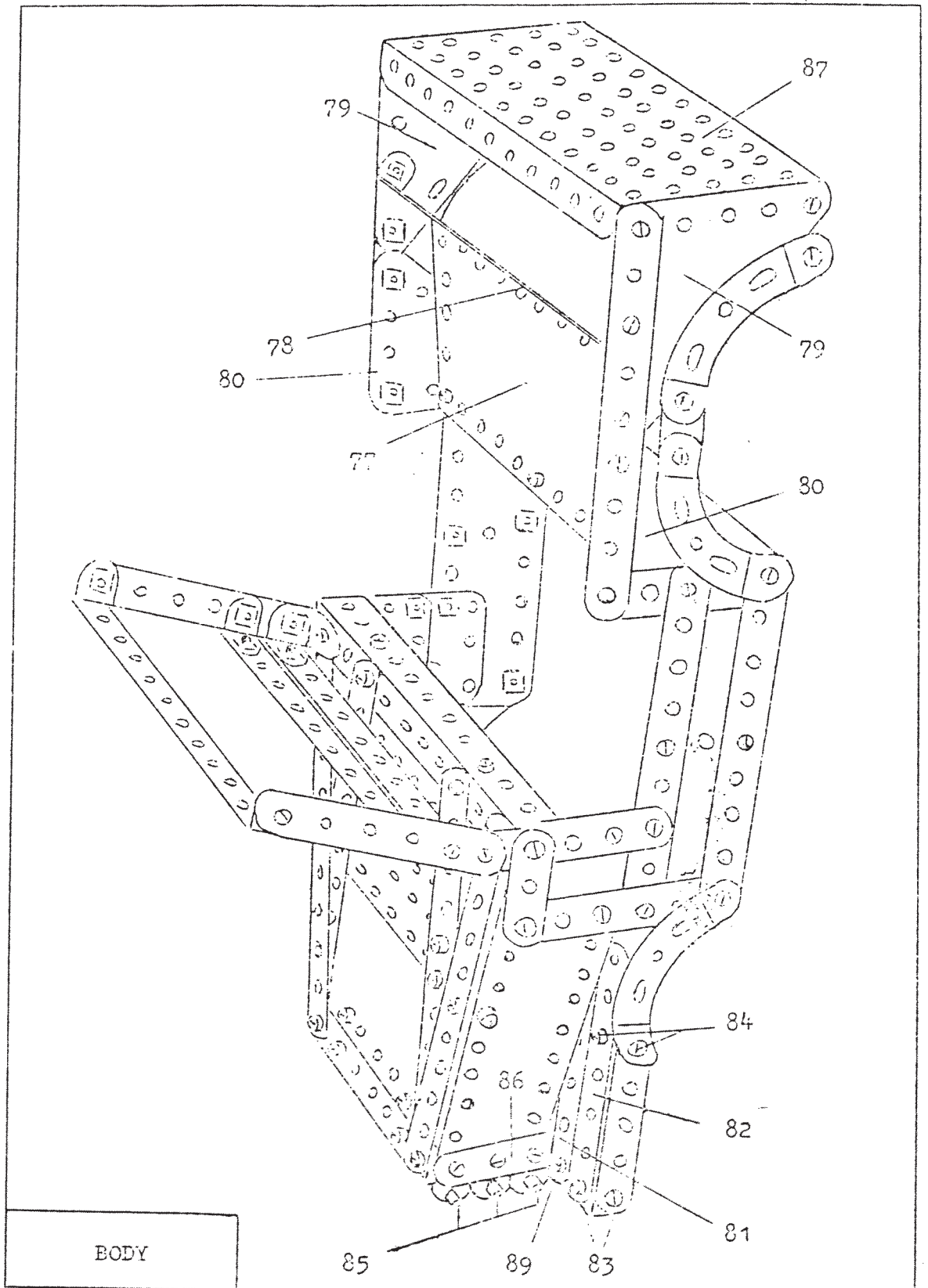


Figure 5

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