

# New Meccano Model

## Electrically Driven Military Light Tank

THIS month's new model represents a light tank and it is a most interesting one to construct and operate. It is driven by an E20R Electric Motor which moves the tracks through a neat and compact differential. This mechanism permits either or both tracks to be driven at will, the selection being effected by a control lever.

The chassis of the model is made from two  $9\frac{1}{2}$ " Angle Girders each extended downward by a  $9\frac{1}{2}$ " Flat Girder, and connected by a  $3\frac{1}{2}$ " Angle Girder 1 and by two  $3\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strips 2. An E20R Electric Motor is bolted by its flanges to the Double Angle Strips 2 as shown in Fig. 2. The Motor side-plates are extended by  $3$ " x  $1\frac{1}{2}$ " Flat Plates, in which are mounted the shafts bearing the reduction gears.

A  $\frac{1}{2}$ " Pinion on the Motor shaft meshes with a 57-tooth Gear on a Rod that carries also a  $\frac{1}{2}$ " Pinion 3. Pinion 3 meshes with a 57-tooth Gear on a Rod fitted with a  $\frac{1}{2}$ " Pinion 4, which engages a further 57-tooth Gear 5 fixed on a Rod 6 (Fig. 2). A  $\frac{1}{2}$ " Sprocket also fixed on Rod 6 is connected by Chain to a  $1\frac{1}{2}$ " Sprocket forming the driving gear of the differential.

The bearings for the rear axle are provided by the chassis Girders, and by a  $7\frac{1}{2}$ " Angle Girder 7 on each side, each of which is attached to the chassis by two  $2$ " Angle Girders. The differential cage is built up by bolting two  $1\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strips between a  $1\frac{1}{2}$ " Sprocket and a Wheel Disc. Two  $\frac{1}{2}$ " Pinions 8 are mounted on a  $1\frac{1}{2}$ " Rod passed through the centre holes of the Double Angle Strips, and a Coupling 9 is fixed on

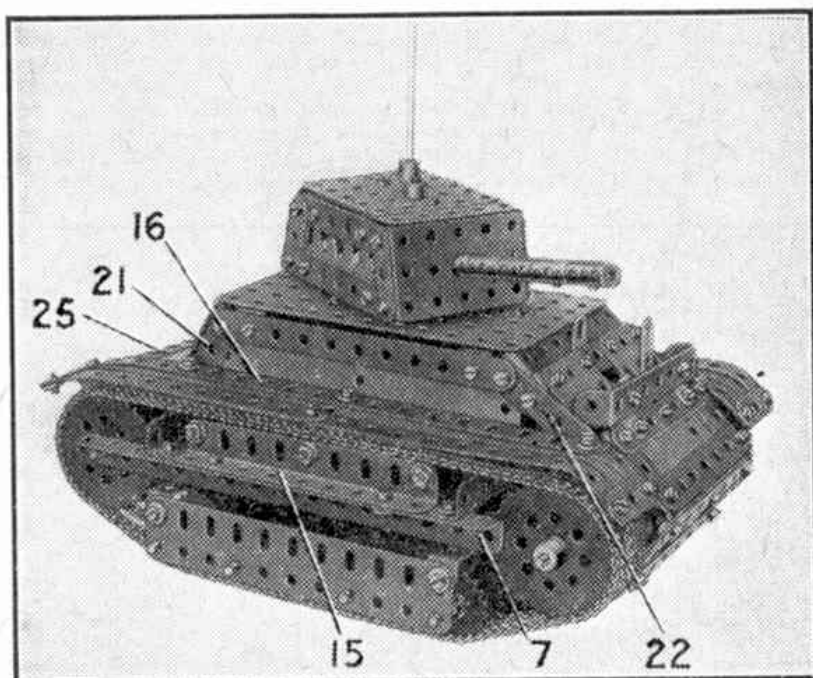


Fig. 1. A light tank steerable by its tracks. The model incorporates a differential transmission to the tracks and is driven by an E20R Electric Motor.

the Rod between the Pinions. One Pinion is free on the Rod and the other is fixed, and both are spaced from the Coupling by two Washers.

The driving axles are passed through Girders 7 and the chassis Girders and into the longitudinal bore of the Coupling 9. A  $\frac{1}{2}$ " Contrate fixed on each axle meshes with the Pinions 8, and four  $2$ " Sprockets are carried on the axles as shown in Fig. 2.

The leading axle is a  $6\frac{1}{2}$ " Rod mounted in the chassis, and it is fitted with two  $2$ " Sprockets on each side. These Sprockets are free to turn and are held in place by Collars, and two  $\frac{1}{2}$ " Bolts are screwed into the boss of each of the inner Sprockets. The Bolts are fixed in position by nuts.

The steering lever is a  $2\frac{1}{2}$ " Strip lock-nutted to a  $1\frac{1}{2}$ " Strip bolted to a Trunnion 10. The Trunnion is fixed to a  $2\frac{1}{2}$ " Flat Girder bolted to the Girder 1, and the bolts serve also to hold a  $2\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip 11. A  $3\frac{1}{2}$ " Rod is freely mounted in the Double Angle Strip, and is fitted with two Spring Clips and two Collars 12. A Bolt held by two nuts at the lower end of the steering lever engages between the Collars 12, so that by moving the lever the  $3\frac{1}{2}$ " Rod can slide in its bearings to engage either of the  $\frac{1}{2}$ " Bolts fixed in the Sprockets. This arrangement prevents one track from operating, while the other is still driven

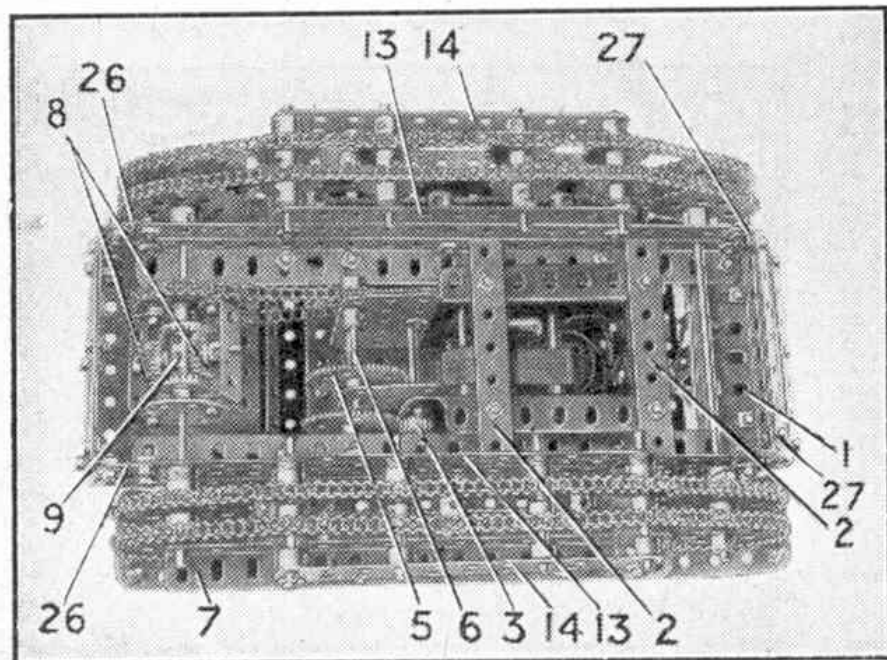


Fig. 2. An underneath view of the tank.

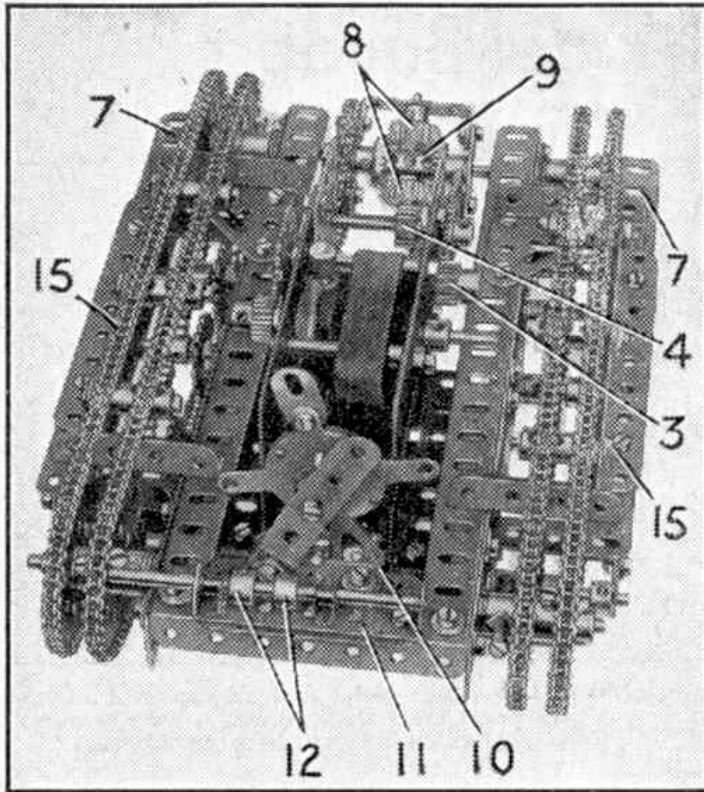


Fig. 3. A front end view of the tank chassis showing the Motor switch and the control for the tracks.

through the differential to steer the model in the desired direction.

The model is supported on four sets of idler sprockets on each side. Each set consists of two 1" Sprockets fixed on a 2" Rod mounted in two 5 1/2" Flat Girders 13 and 14. Flat Girder 13 is bolted direct to one of the 9 1/2" Flat Girders of the chassis, and Flat Girder 14 is attached to two 1 1/2" x 1/4" Double Angle Strips fixed to the chassis. The Sprocket Chain representing the tracks passes round the 1" and 2" Sprockets, and is supported at the top by three rollers, each consisting of a Coupling loosely mounted on a 1 1/8" Bolt. The Bolts are attached by nuts to 1/2" Angle Girders 15 bolted to Girders 7.

The body is assembled as a separate unit and is fixed in position when the chassis is complete. The sides are 5 1/2" x 1 1/4" Flexible Plates bolted to 7 1/2" Angle Girders 16, and braced along their upper edges by 5 1/2" Strips. The sides are spanned by 3 1/2" x 1/4" Double Angle Strips 17, 18, 19 and 20, Fig. 4. The sloping ends are provided by two 2" Slotted Strips 21 and two 2 1/2" Strips 22. These are bolted to the upper corners of the 5 1/2" x 1 1/4" Flexible Plates, and to the ends of the Girders 16.

The rear of the body is completed by two 2 1/2" x 1 1/4" Flexible Plates 23, overlapped three holes and bolted to a 3 1/2" x 1/4" Double Angle Strip fixed between Girders 16. A 3 1/2" x 2 1/2" Flexible Plate, braced by 2" Angle Girders 24, is attached to the Plates 23 by Obtuse Angle Brackets, and the rear edge of the 3 1/2" x 2 1/2" Flexible Plate is braced by a 3 1/2" Angle Girder 25. The latter is extended downward by two 2 1/2" x 1 1/4" Flexible Plates overlapped three holes and edged by two 1 1/2" Angle Girders and a 3 1/2" Strip. The front of the body is completed as shown in Figs. 1 and 4,

and the top is filled in by a 5 1/2" x 3 1/2" Flat Plate fixed to Double Angle Strips 17.

The track covers are 5 1/2" x 1 1/4" Flexible Plates edged by Strips and bolted to Girders 16.

The sides of the turret are made from one 3 1/2", one 3" and two 1 1/2" Strips, and a 2 1/2" Flat Girder. The ends are 2 1/2" x 1 1/4" Flanged Plates and the top is made from two 2 1/2" x 2 1/2" Flat Plates overlapped four holes. The top is fixed to 2 1/2" x 1/4" Double Angle Strips bolted between the sides. The gun consists of Couplings fixed on a Rod held in a Rod Socket.

The turret swivels on a Rod fixed in a Bush Wheel attached to the top of the body.

A Collar is fixed on the Rod underneath the turret so that it is held clear of the bolt heads in the 5 1/2" x 3 1/2" Flat Plate forming the top of the body. A second Collar on the Rod is used to hold the turret in position.

The complete body is attached to the chassis by Fishplates 26 and Angle Brackets 27 (Fig. 2).

Forward and reverse drives are obtained by operating the E20R Motor reversing switch, which is extended by a Fishplate that projects through a slot in the body. The steering lever in its central position allows both tracks to be driven at the same speed, but when the lever is moved sideways one or other of the tracks is prevented from turning. The free track is then driven at increased speed through the differential mechanism and the model will pivot on the stationary track.

It is important to make sure that each track Chain has exactly the same number of links. The teeth of the Sprockets fixed on the driving and idling axes should be in line.

Parts required to build the model Light Tank: 6 of No. 2; 7 of No. 3; 2 of No. 4; 5 of No. 5; 2 of No. 6; 13 of No. 6a; 2 of No. 8a; 4 of No. 8b; 2 of No. 9a; 2 of No. 9b; 6 of No. 9c; 2 of No. 9f; 3 of No. 10; 2 of No. 12; 6 of No. 12c; 1 of No. 14; 2 of No. 16; 2 of No. 16a; 2 of No. 16b; 12 of No. 17; 1 of No. 24; 2 of No. 25; 3 of No. 26; 3 of No. 27a; 2 of No. 29; 2 of No. 35; 141 of No. 37; 27 of No. 37a; 95 of No. 38; 6 of No. 48; 3 of No. 48a; 10 of No. 48b; 2 of No. 51; 1 of No. 52a; 2 of No. 55a; 15 of No. 59; 11 of No. 63; 2 of No. 72; 2 of No. 73; 2 of No. 94; 8 of No. 95; 1 of No. 95a; 16 of No. 96; 1 of No. 96a; 4 of No. 103; 2 of No. 103a; 3 of No. 103f; 2 of No. 103h; 5 of No. 111; 4 of No. 111a; 6 of No. 111d; 1 of No. 126; 2 of No. 133; 2 of No. 179; 8 of No. 188; 6 of No. 189; 1 of No. 190a; 1 of No. 219; 1 E20R Electric Motor.

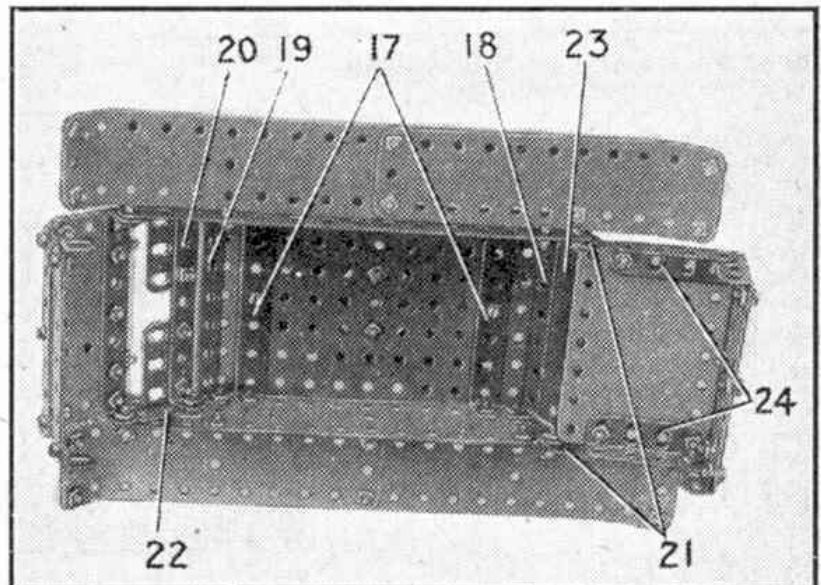


Fig. 4. The tank casing seen from the interior.