

A Special New Model for Large Outfits

Diesel-Engined Motor Tractor

MANY model-builders are eager to build models that are larger and of a more ambitious type than those described each month in the "New Meccano Models" pages of the "M.M." For these Meccano enthusiasts we are describing this month a splendid creeper tractor that is attractive in construction and realistic in action.

The model is shown in the upper illustration on this page. It is based on a type of Diesel-engined tractor used in agriculture, and can be steered by varying the

Trunnions, held by the Bolts 9.

Two 1" Triangular Plates 10 are attached to the Motor. One of them is bolted to the flange and the other is held to the Motor side plate by an Angle Bracket. The various gears of the transmission can then be placed in position.

A Worm is secured to the armature shaft of the Motor. This meshes with a $\frac{3}{4}$ " Pinion on the Rod 11, Fig. 4. A 2" Axle Rod 12 is journalled in the 2" Angle Girders. One end of this carries a $1\frac{1}{2}$ " Contrate Wheel 13 that

is spaced from each other by Spring Clips 20 on two 4" Rods passed through the end holes of the Strips. The frame of the radiator is built up of three $4\frac{1}{2}$ " Strips, two $2\frac{1}{2}$ " Strips, and two $2\frac{1}{2}$ " Curved Strips, bolted together. Two $4\frac{1}{2}$ " Strips are held by Angle Brackets to the frame to form the sides, and the radiator fins are clamped between the frame and the back, which are held together by four $\frac{3}{4}$ " Bolts 21. The back consists of two $4\frac{1}{2}$ " x $2\frac{1}{2}$ " Flexible Plates 19, Fig. 3, overlapped. The complete radiator is held between the front axle supports by the Rod 22 fitted with a Collar on each end.

The plates forming the bonnet top are supported by two $9\frac{1}{2}$ " Angle Girders attached at one end to the sides of the radiator by means of Flat Brackets, one of which is shown at 23, Fig. 3. Centrally between the Girders is a compound 10" angle girder consisting of a $9\frac{1}{2}$ " and a $1\frac{1}{2}$ " Angle Girder overlapped two holes. The front end of this built-up girder is attached to the top of the radiator by an Angle Bracket held by the Bolt 24. Through the other hole in this Angle Bracket passes a $\frac{3}{4}$ " Bolt fitted with six $\frac{3}{4}$ " Discs that form the radiator cap. The rear ends of the $9\frac{1}{2}$ " Angle Girders are bolted to a rectangular frame made up from two $3\frac{1}{2}$ " Angle Girders, a 4" Angle Girder and two $2\frac{1}{2}$ " Curved Strips. The lower ends of the $3\frac{1}{2}$ " Girders are attached to the chassis by Angle Brackets.

The platform for the control levers consists of two $4\frac{1}{2}$ " x $2\frac{1}{2}$ " Flexible Plates 25 overlapped two holes and strengthened by a 3" Angle Girder at the rear. The back of the bonnet is filled in with a $4\frac{1}{2}$ " x $2\frac{1}{2}$ " Flexible Plate and a $4\frac{1}{2}$ " Strip. On this is mounted a switch 26 consisting of a Threaded Pin held by a Nut in the slotted hole of an Angle Bracket. The Angle Bracket pivots on the shank of a $\frac{3}{4}$ " Bolt lock-nutted to the $4\frac{1}{2}$ " x $2\frac{1}{2}$ " Flexible Plate. The Nut on the Threaded Pin makes contact with the head of a 6BA Bolt insulated from the Flexible Plate by Insulating Bushes. Firm contact between the Nut and Bolt head is ensured by a Compression Spring on the $\frac{3}{4}$ " Bolt.

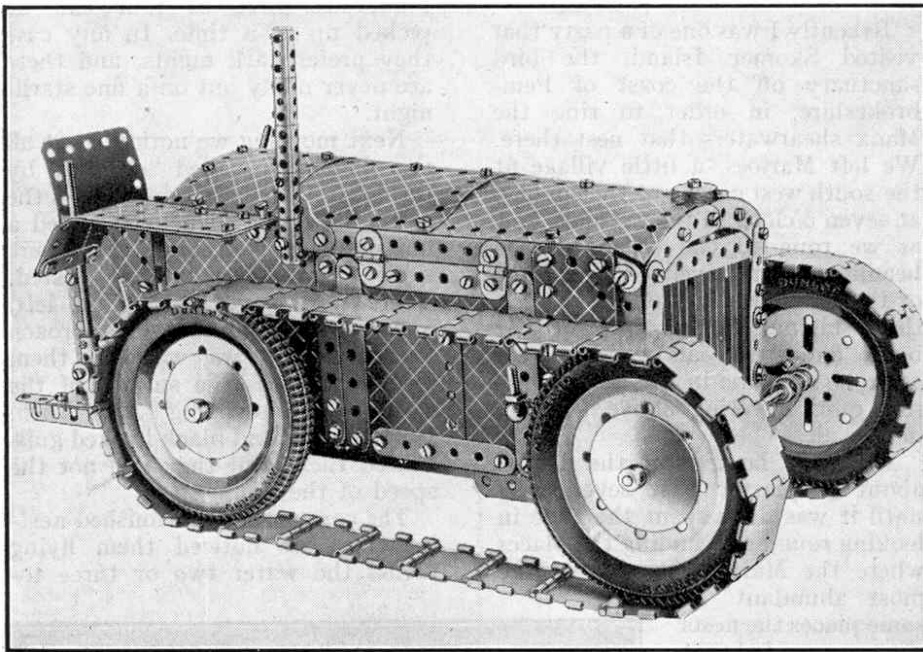


Fig. 1. General view of the Meccano Motor Tractor.

relative speeds of its creeper tracks. These are driven through differential gear by an E120 Electric Motor, each creeper being controlled by a separate contracting band type brake.

Construction of the model tractor is commenced by building up the side members 1, Fig. 3, of the chassis. Each of these consists of a $9\frac{1}{2}$ ", a $4\frac{1}{2}$ " and a $2\frac{1}{2}$ " Angle Girder bolted together. The $2\frac{1}{2}$ " Girder overlaps the $9\frac{1}{2}$ " Girder by 2", and its flange is placed outward. The $4\frac{1}{2}$ " Girder is bolted to the other end of the $9\frac{1}{2}$ " Girder and overlaps it two holes. The slotted holes of all the Girders except the $4\frac{1}{2}$ " Girder are horizontal. Two $1\frac{1}{2}$ " Strips 12 are bolted to the flanges of an E120 Motor, so that the Strips project half an inch outward. The girders are now bolted to the Motor 3, and are spaced $2\frac{1}{2}$ " apart.

Two $2\frac{1}{2}$ " x $2\frac{1}{2}$ " Flat Plates 4, Fig. 4, are spaced 2" apart by two Angle Girders 5. The Angle Girders are held to the Plates by Angle Brackets. Two of the Bolts holding the Angle Brackets are seen at 6. At one side the Plates are held to the chassis by two Reversed Angle Brackets 7, and at the other by a $1\frac{1}{2}$ " Flat Girder 8, Fig. 3. The bearings for the back axle are two

meshes with the $\frac{3}{4}$ " Pinion, and on the other end is a $\frac{1}{2}$ " Pinion. A $3\frac{1}{2}$ " Rod 14 carries two $1\frac{1}{2}$ " Contrate Wheels about $\frac{3}{4}$ " apart and on the Rod between them is a $\frac{1}{2}$ " diameter $\frac{1}{2}$ " face Pinion 15. This Rod is slideable in its bearings and forms the reversing gear. The $\frac{1}{2}$ " diameter $\frac{1}{2}$ " face Pinion meshes with a 57-teeth Gear on the 3" Rod 16, Fig. 3. One end of this Rod carries a Collar and the other end a $\frac{3}{4}$ " Sprocket Wheel 17.

Four $2\frac{1}{2}$ " Curved Strips are overlapped one hole to form a compound 3" curved strip of double thickness. This is bolted to the $2\frac{1}{2}$ " Angle Girders of the chassis by $\frac{1}{2}$ " Bolts, but is spaced from the Girders by three Washers. The same operation is repeated on the other side of the chassis.

The radiator fins are 13 $4\frac{1}{2}$ " Strips, which are

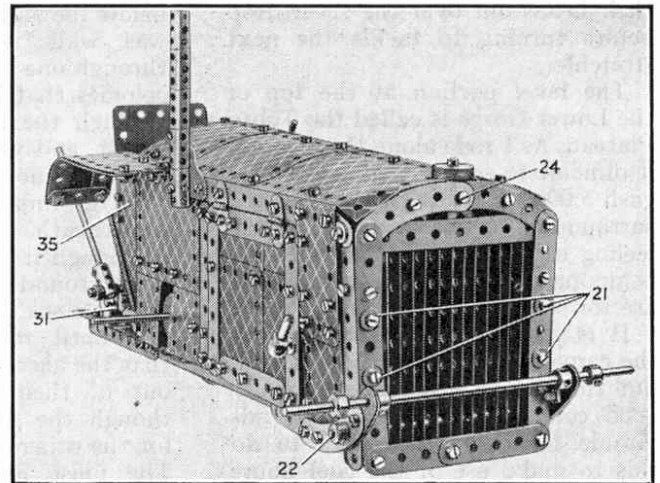


Fig. 2. The Tractor with creepers removed to show details of the bonnet.

Before the bonnet casing is completed the differential gear and reversing gear must be added. The differential gear is shown in Fig. 4. The frame is composed of two $1\frac{1}{2} \times \frac{1}{2}$ " Double Angle Strips 27 bolted between a 3" Sprocket Wheel and a Bush Wheel, the Double Angle Strips being spaced from the Sprocket Wheel by three Washers on each Bolt, and from the Bush Wheel by one Washer on each Bolt. A 2" Rod is journalled in opposite holes in the Double Angle Strips and is gripped by a Grub Screw in a Coupling 28. On each side of the Coupling is a $\frac{7}{8}$ " Bevel Gear spaced from it by a Collar. Two more $\frac{7}{8}$ " Bevel Gears are carried on two $3\frac{1}{2}$ " Rods journalled in the longitudinal bore of the Coupling. These Bevels are spaced from the Coupling by Washers. The Rods are passed through the Trunnions held by Bolts 9, and a 1" Pulley is put on each Rod outside the Trunnions. Both the Bush Wheel and the Sprocket Wheel are free on their respective Rods, but the Bevels are fixed to their Rods by Grub Screws. The 3" Sprocket Wheel is connected to the $\frac{3}{4}$ " Sprocket Wheel 17 by a length of Sprocket Chain. The drive is transmitted to the creeper tracks by the rear wheels. These consist of 3" Pulleys fitted with Tyres and Wheel Discs, and they are mounted securely on the differential shafts.

Construction of the gear changing mechanism is commenced by fixing two Collars on the right-hand end of Rod 14, spacing them about $\frac{3}{8}$ " apart. A 2" Screwed Rod 29 is inserted in the threaded hole in a Collar on the $6\frac{1}{2}$ " Rod 30, which is journalled in Angle Brackets bolted to the sides of the chassis. A Coupling fitted with a $2\frac{1}{2}$ " Screwed Rod is fixed on the other end of the $6\frac{1}{2}$ " Rod to form the reversing lever.

The model is steered by altering the speeds of the creeper tracks relative to each other. This is effected by means of two

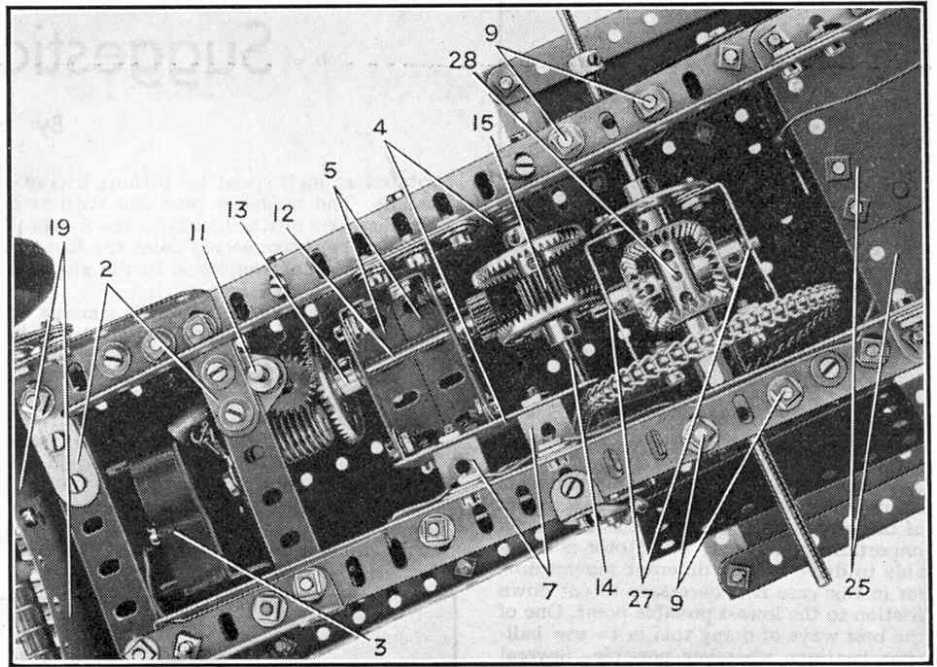


Fig. 4. Underneath view of the Tractor showing the transmission gearing and differential.

then passed over the 1" Pulley on the differential shaft and tied to the Rod of the control lever.

One side of the bonnet casing is provided with a hinged inspection door. Two $3\frac{1}{2}$ " Strips, one of which is shown at 33 in Fig. 3, are fixed between the $9\frac{1}{2}$ " Angle Girders of the bonnet frame and the chassis. They are held in position by Angle Brackets and Flat Brackets, and one of them is bolted 1" and the other 5" from the front end of the chassis. The forepart of the front side is

Handrail Support fitted with a Threaded Pin in its threaded hole. A Pawl without boss is lock-nutted on the shank of the Handrail Support to form the latch.

The driver's seat is a $2\frac{1}{2} \times 2\frac{1}{2}$ " Flexible Plate fixed between sides consisting of $3\frac{1}{2} \times 2\frac{1}{2}$ " Flexible Plates, one of which is shown at 35 in Fig. 2.

The front wheel axle can now be placed in its bearings. It is an 8" Rod and is held in position in the Curved Strips of the chassis by means of Collars, as shown in Fig. 2. Two 3" Pulleys, complete with Tyres and Wheel Discs, are placed on the ends of the Rod and are kept in place by further Collars. The Pulleys must revolve freely on the Rods.

Each of the creeper tracks consists of 25 Dinky Builder Small Squares, linked together to form an endless belt by means of Dinky Builder $1\frac{1}{8}$ " Rods.

The electrical connections to the Motor and its control switch are made as follows. Two Terminals are fixed to a 3" Angle Girder bolted to the side girders of the chassis at the rear end. The Terminals are insulated from the Girder by means of Insulating Bushes and Washers. A wire is taken direct from one of the Terminals to one of the terminals of the Motor. A second wire is then led from the second Terminal to the Bolt of the Switch 26. The Bolt holding the switch arm is then connected to the other terminal of the Motor. All the gears and bearings of the model should be oiled before it is set in motion.

Parts required to build model Creeper Tractor: 4 of No. 2; 17 of No. 2a; 6 of No. 3; 2 of No. 4; 2 of No. 5; 8 of No. 6a; 5 of No. 8a; 2 of No. 9a; 2 of No. 9b; 2 of No. 9c; 4 of No. 9d; 3 of No. 9f; 8 of No. 10; 32 of No. 12; 2 of No. 12b; 1 of No. 13a; 1 of No. 14; 1 of No. 15; 1 of No. 15a; 4 of No. 16; 1 of No. 16a; 1 of No. 16b; 2 of No. 17; 4 of No. 19b; 2 of No. 22; 1 of No. 24; 1 of No. 25; 1 of No. 26; 1 of No. 26a; 1 of No. 27a; 3 of No. 28; 4 of No. 30; 1 of No. 32; 28 of No. 35; 224 of No. 37a; 208 of No. 37b; 85 of No. 38; 1 of No. 40; 2 of No. 48; 2 of No. 48a; 21 of No. 59; 9 of No. 63; 2 of No. 72; 2 of No. 77; 1 of No. 80; 1 of No. 81; 12 of No. 90; 1 of No. 94; 1 of No. 95b; 1 of No. 96a; 1 of No. 103b; 6 of No. 111; 2 of No. 111a; 10 of No. 111c; 2 of No. 114; 2 of No. 115; 2 of No. 116a; 1 of No. 120b; 2 of No. 125; 2 of No. 126; 1 of No. 136; 4 of No. 142b; 1 of No. 147c; 6 of No. 182; 7 of No. 188; 2 of No. 189; 7 of No. 190; 6 of No. 190a; 7 of No. 191; 2 of No. 192; 5 of No. 2017b; 4 of No. 219; 3 of No. 1575; 3 of No. 1583; 3 of No. 1563; E120 Electric Motor; 50 Dinky Builder Small Squares; 50 Rods from Dinky Builder $1\frac{1}{8}$ " Rods.

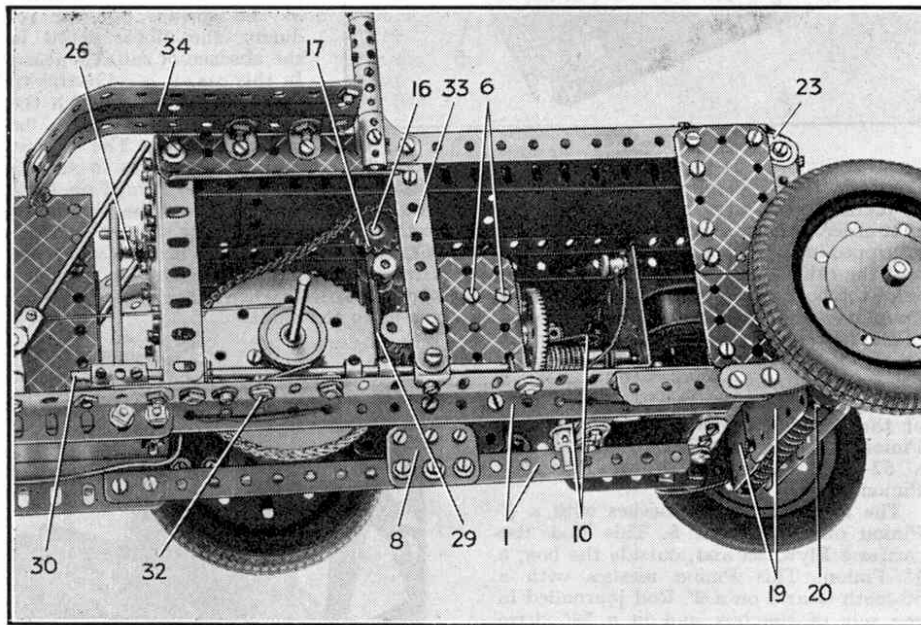


Fig. 3. This illustration shows how the drive is transmitted to the creeper tracks.

contracting band brakes, fitted one to each half of the rear axle. Each brake, with its control gear, is constructed as follows. A 4" Axle Rod is held in the bore of a Coupling and forms the control lever. The Coupling is held by two $\frac{3}{8}$ " Bolts between the arms of a small Fork Piece 31, which is fixed to the chassis by a $\frac{1}{2}$ " Bolt. A piece of Cord is tied to the Bolt 32, as shown in Fig. 3, and is

filled in with two $2\frac{1}{2} \times 1\frac{1}{2}$ " Flexible Plates overlapped as shown. The inspection door consists of two $2\frac{1}{2} \times 2\frac{1}{2}$ " Flexible Plates and two $2\frac{1}{2} \times 1\frac{1}{2}$ " Flexible Plates, bolted together to form a rectangular frame measuring $4 \times 3\frac{1}{2}$ ". This is strengthened by two $3\frac{1}{2}$ " Strips and two 3" Strips bolted around its edges as shown in Fig. 2, and is fitted with two Hinges. The handle is a

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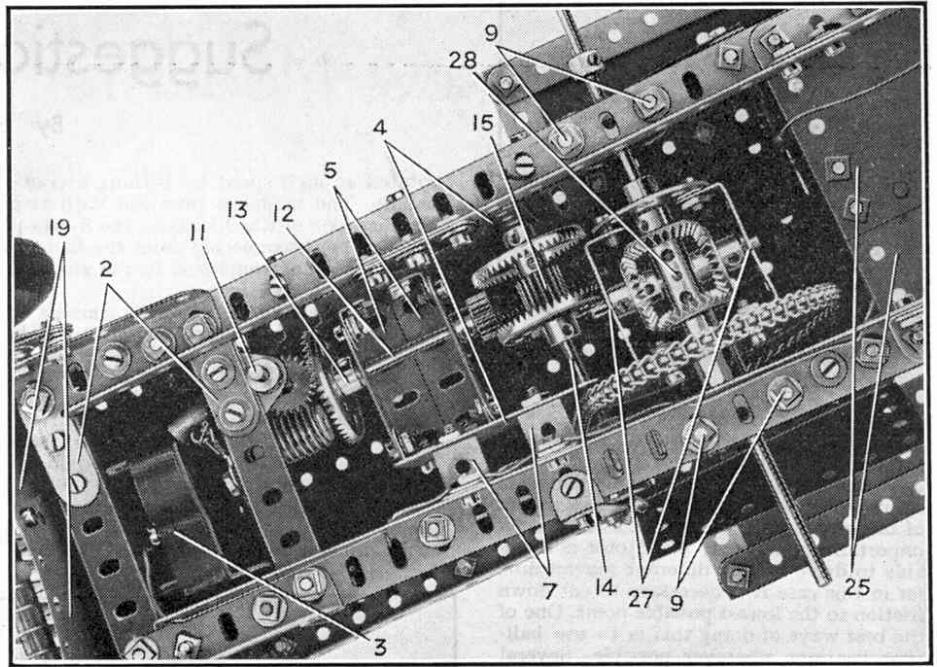


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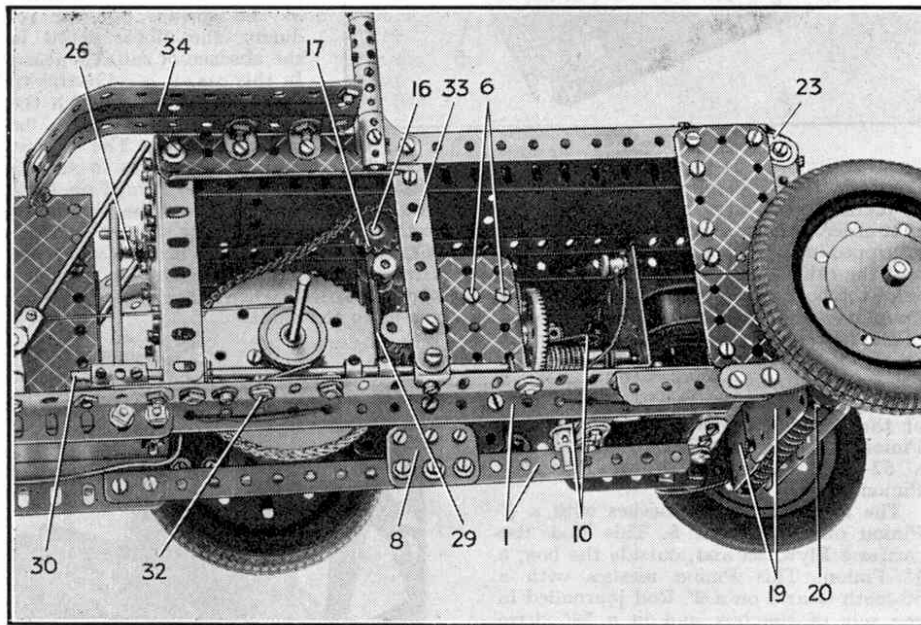


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