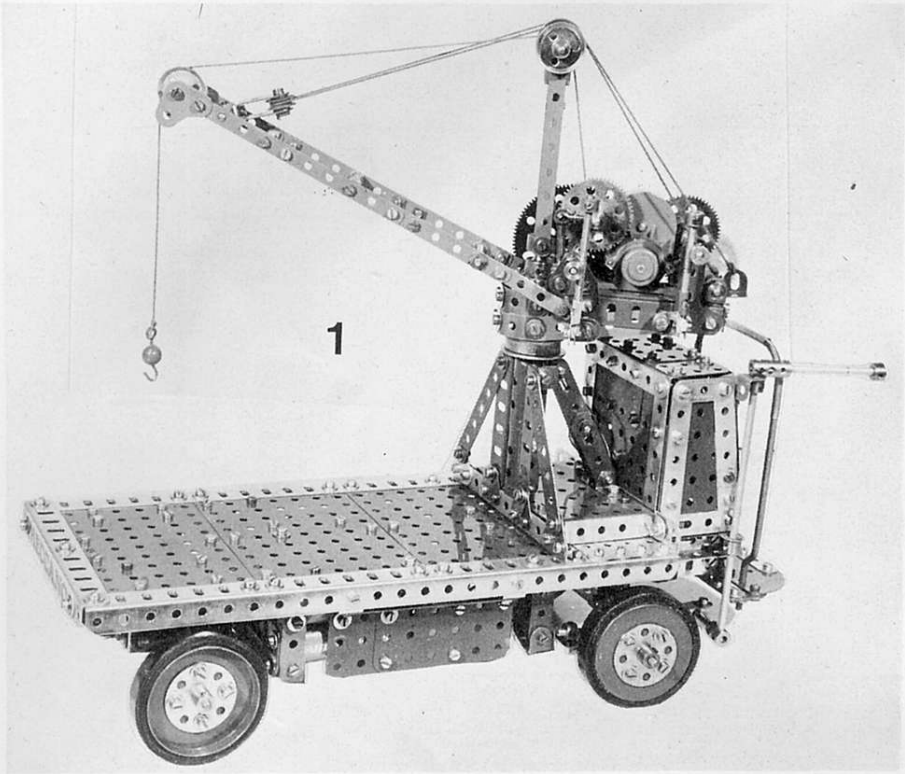


Eric Jenkins had a dedicated approach to his Meccano Modelling based on an eye for detail and realism of appearance which graced the dozens of models, large and small, which he regularly brought to Society meetings. Fortunately much of his work is recorded and we have pleasure in presenting here his reproduction of the Collis Crane-truck in Meccano, based on a cigarette card-size photograph of the prototype published in Meccano Magazine some forty years ago! This model would have been published a decade back, but the Meccano Emebo Motor of the period had gone out of production. Fortunately, the new Meccano Crane Kit motor scales in nicely to size and may be used as a replacement with a few modifications.

COLLIS CRANE-TRUCK

A fine model designed and built by the late Eric Jenkins and featured here as an M.M. tribute to a modeller of outstanding ability.

CHASSIS AND PLATFORM

Fig. 1, giving the rear quarter view of the model shows the general construction. A pair of 12½" Angle Girders are spaced by three 5½" x 3½" Flat Plates, butted edge-to-edge from the rear. A 5½" Angle Girder is placed across the rear end, as shown, with a Washer under the centre elongated hole of the Girder to keep levels correct. Three more 5½" Girders are used at the front end of the platform, one on top with its elongated holes upwards and two more below in the form of a "U" channel girder.

A sub-assembly which simulates the massive battery box of the prototype electric truck is now built up on each side from lapped 2" and 2½" Girders, overlaid with lapped 3" x 1½" Flat Plates to give an eight hole length. Washers or Fishplates are placed under appropriate points, again, to maintain a smooth line and the two sides are joined together by a 5½" Angle Girder (out of view in Fig. 4), with its elongated holes forward and its round hole flange tucked up underneath the platform. The securing Bolts for this Girder can be seen in Fig. 4, four holes back from the leading edge of the short lapped Girders. Additional strengthening of the sub-assembly is provided by a 4½" x ½"Double Angle Strip set three holes in from the rear and this can be clearly seen in Fig. 4, a 1½" Angle Girder being added as a forward clamp to the flat torch battery (4½ volts) used for powering the transmission and crane motor.

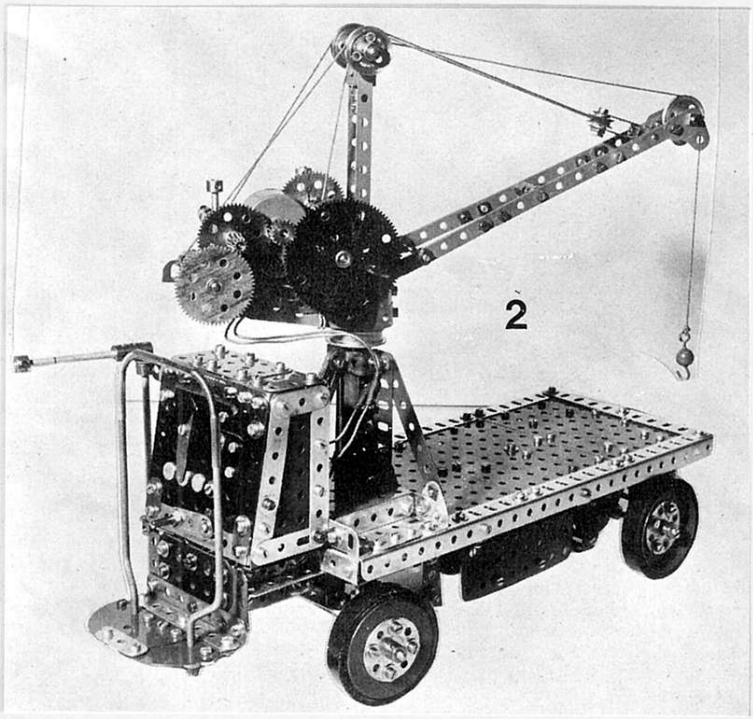
STEERING GEAR

This section is also in the form of a sub-assembly using a pair of 7½" Angle Girders spaced five holes apart, as shown in Fig. 4. Six holes back from the front, these Girders are joined by a double thickness of 4½" Narrow Strips bolted to the round holes of the Girders and it is the outer end holes of the Narrow Strips which provide the upper journals for the "Kingpins" in the steering mechanism. At the rear, 1½" Angle Girders reinforced with 1½" Corner Brackets provide supports on the 7½" Girders for a double thickness of 2½" Flat Girders which join the side members and provide a forward journal for the transmission shaft. All of this can be clearly seen in Fig. 4 in the vicinity of the 1" Gear Wheel.

As this type of truck is designed to run on a flat concrete factory floor, it is 'solid' built throughout to provide a stable platform when handling heavy goods and no suspension is provided. A heavy-duty front axle is made from two layers of 3½" Strips fitted with a Crank from below at each end, set two holes in. The inner securing Bolts also fix 1" x ½" Angle Brackets which are attached to the 7½" Angle Girders above and, as these brackets are reinforced with 1" Corner Brackets, the front axle is well supported. Again, packing Washers are needed under the forward holes of the Corner Brackets, see Fig. 4.

Before any further assembly is carried out the motor for the transmission must be fitted. This is the Meccano 6 – 12 volt Motor with Gearbox and it is slung centrally under the platform. By studying Fig. 1, the first pair of Bolts fixing the motor can be seen at platform level just behind the crane post. The 5½" Angle Girder which can be seen at this point supports the rear legs of the crane post and its centre fixing Bolts also locate the rear holes underneath of the motor base (packing Washers again!) Once the motor is fixed in position, the box sub-assembly can be bolted to the platform side Girders by ½" Angle Brackets, the location being clear from Figs. 1 and 2. When this is in place, the steering sub-assembly is attached by being bolted to the lower 5½" Girder across the front of the platform and to the other 5½" Girder attached inside the box as previously described.

Basic tiller steering is provided on the model as on the prototype and much of the construction is obvious from Fig. 4. The Kingpins are formed by 2" Rods which are passed through the Cranks and into the end holes of the Narrow Strips above and located by Collars, etc. Handrail Couplings are used to hold stub



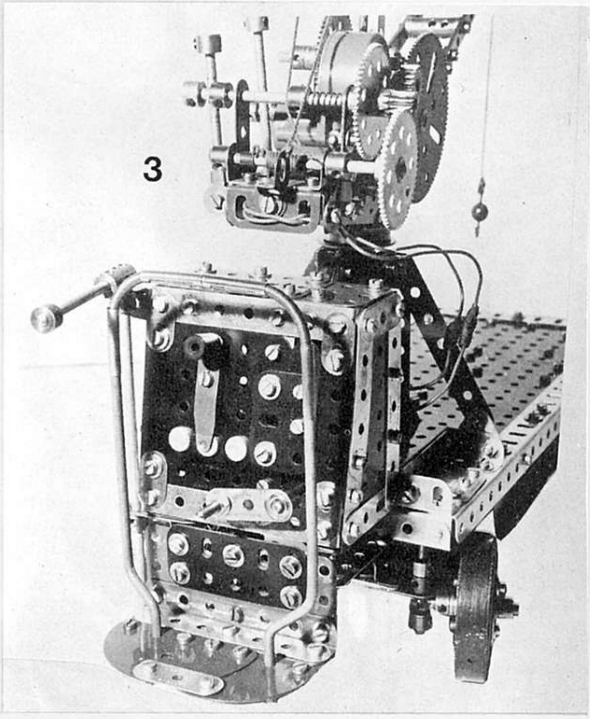


Fig. 1 on opposite page and Fig. 2, above left, show general views of the late Eric Jenkins' Collis Crane-Truck. Note the solid construction and attention to detail. Fig. 3, above right, shows a close-up of the driver's platform and the winch section of the crane. The obsolete Emebo Motor illustrated can be replaced by a modern Crane Set Motor.

axles and to receive Long Threaded Pins in their tapped bores to form steering arms. The track rod is a sandwich of two 4½" Narrow Strips, bolted together as shown and pivoted at each end by Set Screws tightened in the Collars on the end of the Long Threaded Pins. The 'offside' (left hand wheel viewed from the front) has its Kingpin fitted with a Short Coupling extended by a 1" Rod into a Collar and a draglink is made from a 3" Narrow Strip lock-nutted to Collars, as shown, while a second Short Coupling connects this to the vertical 5½" Rod forming the steering column. Fig. 1 shows how this is journalled in the boss of a Crank and a Corner Angle Bracket on the side of the truck.

WHEELS AND TRANSMISSION

All four wheels are made from pairs of Wheel Flanges, the rear wheels having the flanges back-to-back and secured by four ⅜" Bolts to 8-hole Bush Wheels outside and to Wheel Discs inside. The front wheels have both flanges pointing in the same direction, with the faces of the Wheel flanges being separated by Collars and fitted with Bush Wheels on the inside and Wheel Discs outside. The front wheels are held on their 1½" stub axles by external Collars with Washers fitted where appropriate.

Fig. 5 shows the partly assembled rear axle which is made from one 3" Rod having a fixed ¾" Contrate and a 3½" Rod, also having a fixed ¾" Contrate, but carrying the free-running differential gear. This is a modified, but recommended alternative to Eric Jenkin's original design which uses a non-standard short screwed rod to lock a pair of Collars together. A start is made on the assembly by making the axle brackets from Flat Trunnions and Girder Brackets bolted to the platform as shown. Different spacing of the brackets is required, those holding the shorter 'half-shaft' being spaced three holes apart (nearest camera) and reinforced with Washers and lock-nuts on a 2" Screwed Rod. The other pair of brackets are only two holes apart to leave room for the crown wheel of the differential and this time a ¾" Bolt lock-nutted into a Threaded Boss reinforces the Trunnions. Finally a 4½" Flat Girder is bolted on by ½" Angle Brackets to the rear ends of the Girder Brackets. It should be noted that the outer brackets are set in one hole from each side of the truck.

Providing rigid bearings for the two half-shafts like this allows a simple self-aligning differential 'carrier' to be used. A single 19-t Pinion is mounted on a ¾" Bolt with two (possibly three) Washers under the bolthead and set into the tapped bore of a Coupling as shown. A lock-nut secures the ¾" Bolt in the Coupling at a critical depth to prevent contact with the end of the 3½" Axle Rod on which the Coupling is free to revolve and to float sideways. A 1" Rod is fixed into the second transverse bore of the Coupling and this freely engages with a hole in the large Bevel Gear. This gear is free to revolve on the 3½" half-shaft, but should be critically spaced from its adjacent Trunnion by shim washers (Electrical Thin Washers) when its small driving Bevel is fitted in the final transmission. Setting of the two ¾" Contrate gears is achieved by the Double Collars between each pair of axle brackets.

This 'single pinion' type of differential is adequate for the low running speed of such a truck, but a second 19-t Pinion may be fitted if required. It is important before fitting the gearing to test the alignment of all four Flat Trunnions by means of a 6½" Rod passed through them. A rear support for the transmission shaft is provided by a Double Bent Strip bolted to a 4½" Flat Girder supported on 2" Angle Girders, clearly shown in Fig. 5. The isolated Girder Bracket also shown is an adjustable grip for the pocket flashlamp battery used to power the model. Final stages of the transmission are seen in Fig. 4 where a 1" Gear Wheel meshes with a 19-t Pinion on the motor shaft, set in the lowest ratio. A straight 6" Rod is used for the driving shaft, its lateral position being adjusted by Collars and Washers.

CONTROL CONSOLE

The Control Console is made from a 3½" x 2½" Flanged Plate extended upwards by lapped 2½" x 1½" Flexible Plates, the outline being overlaid with three 3½" Strips, as shown in Fig. 1. A 3½" Angle Girder at the top holds a compound plate made from three 1½" Square Flat Plates. Side panels are provided by 3½" x 1½" Flat Plates with overlaid Strips (see Fig. 2), 2" Slotted Strips assisting in getting the trapezoid shape shown. Two 3½" x ½" Double Angle Strips reinforce the front panel at top and bottom and it is to these that the switchgear is attached. Constructors who have Meccano Electrical parts may follow the illustrations of the original model, otherwise the Insulated Plates shown may be replaced by two or three thicknesses of 2½" x 1½" Blue Plastic Plates, or even a sandwich of Transparent Plastic Plates. It is really only necessary to have a simple change-over switch to supply the crane section or transmission motor as required. The use of the smaller Plastic Plates suggested will enable suitable holes to be located for the switch contact studs. At the base of the control console, 2" Angle Girders are attached at each side and bolted to a second pair of 2" Girders with round hole flange downwards. This, in turn, is bolted to a 2" Flat Girder each side. The completed console is then bolted to the forward projection of the 7½" Girders forming the steering sub-assembly.

When operating the vehicle, the driver stands on the small front platform and may face in either direction. His handrails are combinations of Crank Handles, Rod Connectors and Flexible Coupling Units fixed in Double Arm Cranks as can be seen in Figs. 2 and 4. A 3½" Flat Girder joins two Semi-circular Plates for the driving platform and a 3½" Angle Girder is used to attach this to a pair of 1½" Flat Plates joined by a 2½" Flat Girder (standard or insulated) forming the vertical side of the driver's platform. Four ½" Angle Brackets are then used to fix the platform to the front of the truck chassis.

Readers will notice that a Crank with Threaded Pin is provided on the control console half way up at the front. It is shown in the "OFF" position. Vertically upwards it operates the FORWARD motion of the truck and vertically downwards it puts the truck into REVERSE by a rotary double pole change-over switch constructed inside the console, originally from Meccano Electrical parts. This consists of a pair of 8-hole Insulated Bush Wheels carrying stud contacts wiping against Wiper Arms connected to the two battery terminals by flexible cable under the chassis. Reversing of the crane motor is carried out in the same manner on the original as both motors are selected by the first switch mentioned. However, assuming that a Crane Kit Motor is used →

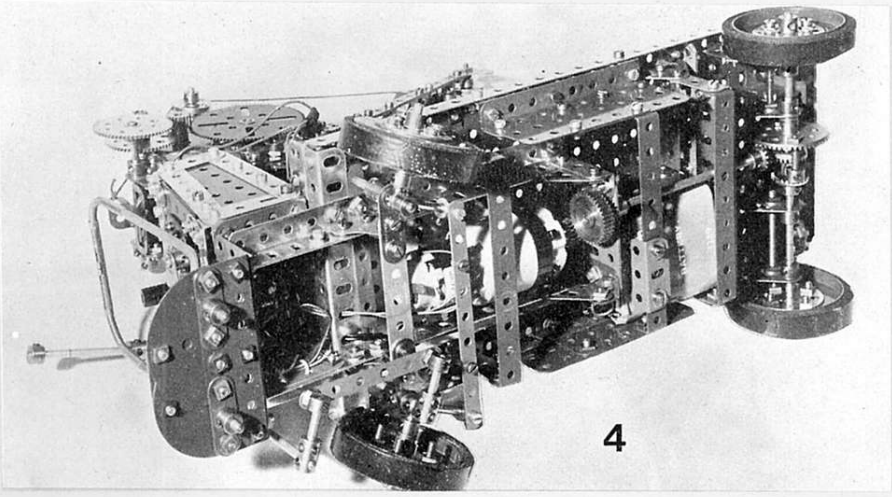


Fig. 4, an underside view of the Truck showing the main traction drive motor – a Power Drive Unit – and the tiller steering gear. Note that power is supplied by a 4½ volt "flat" torch battery carried within the model.

in an up-to-date rebuild, its starting, stopping and reversing can be done manually from the crane platform.

CRANE CONSTRUCTION

Most of the details of the crane base and supporting legs for the crane post can be seen in Fig. 1. A 3½" x 2½" Flanged Plate is fitted with Double Angle Strips at each end and a Double Arm Crank from underneath, thus holding the bottom end of an 8½" Rod on which the upper portion of the crane is free to swivel. A 2½" Strip overlays the slotted flanges of the Flanged Plate for the sake of appearance. Three 5½" Strips fill in the gap across the main platform between the two 5½" Angle Girders and the Flanged Plate fits inside these Girders.

Two Sleeve Pieces are bolted to a pair of 3" Angle Girders and this construction requires care and preferably the use of a small pair of tweezers. Assembly is started by pushing a Chimney Adaptor, closed end uppermost, into the first Sleeve Piece and then the 3" Girders are fixed to the bottom holes keeping the Nuts finger-tight. A Rod is pushed through the third holes of the Girders and the top holes of the Sleeve Piece and then the internal Chimney Adaptor is pushed down until it locates against the Nuts. The Bolts are tightened up, then a second pair are added after withdrawing the Rod. This now locks the lower Sleeve Piece in place. Careful study of Fig. 1 shows the correct aspect of the two Sleeve Pieces and the second one is bolted on at the fourth hole up on the 3" Girders, but this time it will be necessary to feed the two Nuts down inside the Sleeve with tweezers. A second Chimney Adaptor is placed inside the upper Sleeve Piece and pushed down just far enough to clear the top side holes of the Sleeve Piece.

At this stage, some further work is required on the 3½" x 2½" Flanged Plate by fitting it with a pair of ½" Angle Brackets to support the rear strut of the Crane Post. This can be seen in Fig. 1. Four 2" Slotted Strips form the top part of the strut and are sandwiched at the upper end by a pair of ½" Reversed Angle Brackets. The lower part of the strut is two more 2" Slotted Strips packed with Washers on a ½" Bolt through the bottom Angle Brackets. The slotted lugs of the upper Reversed Angle Brackets are now bolted to the top of the second Sleeve Piece, through the 3" Girders by ⅜" Bolts packed with Washers as necessary. A straight 8½" Rod is fitted with a Bush Wheel, boss downwards, and the Rod is pushed through the two Chimney Adaptors, through the rear centre hole of the Flanged Plate and into the boss of the Double Arm Crank below. A check should be made for length of insert. The Bush Wheel is held to the Rod and the Rod is then pushed back into location with the Double Arm Crank and locked so that the Bush Wheel face locates on the top of the upper Sleeve Piece. The Flanged Plate is fitted between the two transverse 5½" Girders and it is bolted to them by the Double Angle Strips. Two 3½" Strips are fixed by 1" Triangular Plates to the rear 5½" Girder to act as front struts for the crane post and then the two vertical 3" Girders are secured by pairs of Fishplates as shown in Fig. 1.

The crane motor platform is made from a pair of 3½" Girders spaced at the rear by a 1½" Girder and 2½" x ½" Double Angle Strip. If a Crane Kit Motor is used, the 3" Girders are inverted so that the motor can drop down between them, Washers being used to achieve correct meshing height as required, see Figs. 1 & 3. An 8-hole Bush Wheel is locked into a Socket Coupling then the Bush Wheel is fitted with three 1" x ½" Angle Brackets. Two Threaded Bosses are bolted to the top of a large Flanged Wheel. The Flanged Wheel is connected to the Bush Wheel by side Bolts passing through overlaid 2½" Strips as shown in Fig. 1. The upper Strips are fixed to the 3½" Girders and the lower Strips are secured at the same points with internal Fishplates. The upper Strips are bent to meet in front of the crane post and thus are bolted to the 1" x ½" Angle Bracket on the front of the Bush Wheel. The lower Strips are secured at the same points with internal Fishplates. The upper Strips are bent to meet in front of the crane post and they are bolted to the 1" x ½" Angle Bracket on the front of the Bush Wheel. The lower Strips are similarly treated, then two Rod Sockets are fixed vertically on the leading top holes of the 3" Girders with 1½" Axle Rods topped by Handrail Supports being fixed in these Rod Sockets. Their threaded portions point to the rear and carry Collars by the tapped bores to act as self-aligning bearings for the crane hoisting drum.

A 2" Rod carrying a 57-t Gear and a Collar is used for the winding drum, only a short length of Cord being required to reach to floor level. The intermediate shaft for the winding drum is a 2½" Rod having a 19-t Pinion in sliding mesh with the 57-t Gear and a 95-t Gear Wheel set so that it is normally out of mesh with the 19-t Pinion on the motor drive shaft. This intermediate shaft is spring-loaded and can be slid into the drive position by the forward lever shown in Figs. 1 and 3 and it is carried in journals made from 1" Triangular Plates mounted at each side as shown. A 3" Rod is used for a luffing drum and is fitted with Collars, Washers, a Cord Anchoring Spring and a 60-t Gear Wheel. Its intermediate shaft is also a 3" Rod, spring-loaded and fitted with two Collars, to embrace the gear-shift lever, a third Collar to compress the Spring and a 57-t Gear followed by a No. 1 Clockwork Motor pinion. This latter pinion stays in mesh with the 60-t Gear Wheel and the shift lever puts the 57-t Gear into mesh with the motor pinion as required. Journals for the luffing intermediate shaft are vertical 2" Strips supported by 1" Corner Brackets as the near end of the side Girders (see Fig. 3). Spring tension on both intermediate shafts is enough to have a braking effect on both drums in the disengaged positions. Each gear-shift lever is mounted in a Rod and Strip Connector lock-nutted to Angle Brackets secured to the crane sides as shown, sufficient grip being set to prevent the levers being sloppy in action.

At this point the crane body may be placed on the crane post and the Socket Coupling extended upwards by a pair of 4½" Narrow Strips bolted one hole below the top to a Large Fork Piece. A Collar fixed to the Rod just below the Fork Piece adjusts the height of the crane body to just clear the contact below, between the rim of the large Flanged Wheel and the Bush Wheel. Packing Washers and a Collar just above the Socket Coupling prevent the crane from rising vertically on its post. A tapered support to the sides of the crane base is given by a 2" Strip on the lever side and a 2½" Strip on the gearing side running outwards and upwards from the lower curved 2½" Strips, see Fig. 2. Jib details are evident from the various views and while no parts list is available, the open and comparatively simple construction of the model should appeal to a wide readership.

Finishing touches to the model are provided by giving it a set of 'tyres'. In the original model, black fabric adhesive tape was carefully wound on, but thick, wide rubber bands would suffice. For a professional finish, ½" wide black rubber or plastic driving belts from a certain range of vacuum cleaners will do the trick!

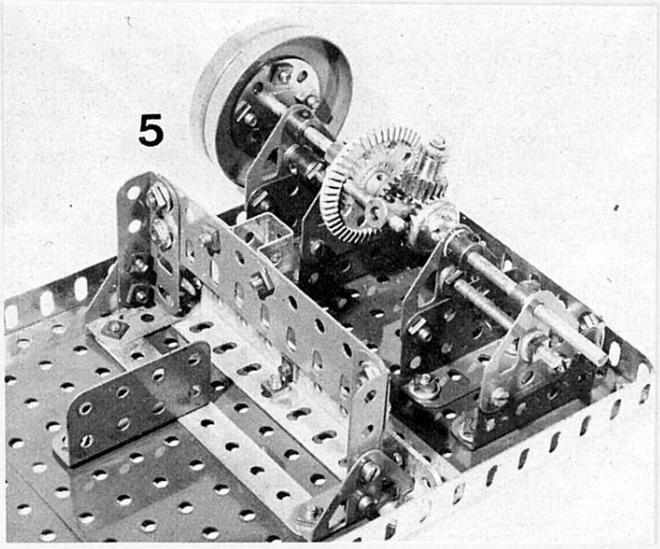


Fig. 5, the rear axle in partly-assembled form. The mechanism illustrated is a modified, though recommended alternative to Eric Jenkins' original design which actually made use of a non-standard screwed rod length. Note the 'single pinion' type of differential which is all that is required in view of the slow speeds at which the Truck operates. However, a second Pinion can be added if desired.