

New Meccano Model

Pedestrian-Controlled Stillage Truck



Fig. 1. The internal expanding brake fitted to the driving wheel of the truck.

THE attractive model shown in Fig. 2 on this page represents a type of truck used in many factories and warehouses for the internal transport of goods. The truck is driven by an Electric Motor, and in actual practice the current supply is obtained from

a battery of accumulators. The goods to be carried are stacked on a special stillage platform fitted with runners or legs, and the truck is manoeuvred so that its chassis passes between the legs of the platform. The platform is then raised until its legs clear the ground and the truck can then be driven to the required point for unloading. In the real machine raising and lowering of the platform is controlled hydraulically, but in the model these movements are operated by a ratchet lever and a system of Cords.

The chassis of the model is made by connecting two $9\frac{1}{2}$ " Angle Girders 1 to two $7\frac{1}{2}$ " Angle Girders 2 and 3. The Girders 1 are bolted direct to Girder 2, but they are connected to Girder 3 by Angle Brackets. A $1\frac{1}{2}$ " Angle Girder is bolted at each side to Girders 2 and 3, and two $3\frac{1}{2}$ " Angle Girders 4 and a $3" \times 1\frac{1}{2}"$ Flat Plate are bolted to each $1\frac{1}{2}"$ Angle Girder.

The raised platform section of the chassis is made by bolting $5\frac{1}{2}"$ Angle Girders 5 to the upper ends of Girders 4, and a $7\frac{1}{2}"$ Angle Girder is bolted across the ends of Girders 5. The top of the platform is filled by a $5\frac{1}{2}" \times 3\frac{1}{2}"$ Flat Plate, a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flat Plate and a $3\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate. These are arranged to leave a gap in one corner as shown in Fig. 4 to accommodate the ratchet control lever.

The motor unit is pivotally connected to the chassis by a Ball Thrust Bearing. The Toothed Disc of the bearing is bolted to the truck chassis, and the Flanged Disc is fixed to the flanges of an E20R Electric Motor. A Bush Wheel is attached to the centre of the Toothed Disc, and a $1"$ Rod held in the Bush Wheel is passed through the centre of the Bearing. A Collar is fixed on the Rod between the Flanged Disc and the Motor field magnet.

The truck driving wheel is carried by a special framework attached to the Electric Motor. The framework consists of a $3\frac{1}{2}"$ Strip 6 and two $2\frac{1}{2}"$ Curved Strips on each side, joined to the Motor sideplates as shown in Fig. 4. The sides are connected by a $1\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 7, and the bolts fixing this in position hold also Fishplates 8. The bearings for the driving wheel axle consist of Cranks 9 bolted

to Flat Trunnions fixed to the $2\frac{1}{2}"$ Curved Strips.

The driving wheel is a $2"$ Motor Tyre pressed over a Boiler End that forms also the brake drum. A $1\frac{1}{2}"$ Sprocket is attached to the Boiler End by $\frac{3}{4}"$ Bolts, but is spaced from it by three Washers on each Bolt. The complete wheel is free to turn on a $2"$ Rod held in the bosses of the Cranks 9, and it is retained in position on the Rod by a Collar.

The brake is shown separately in Fig. 1. The back plate is a $2"$ Pulley and the shoes are $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips curved to fit inside a Boiler End. Each shoe is fitted with

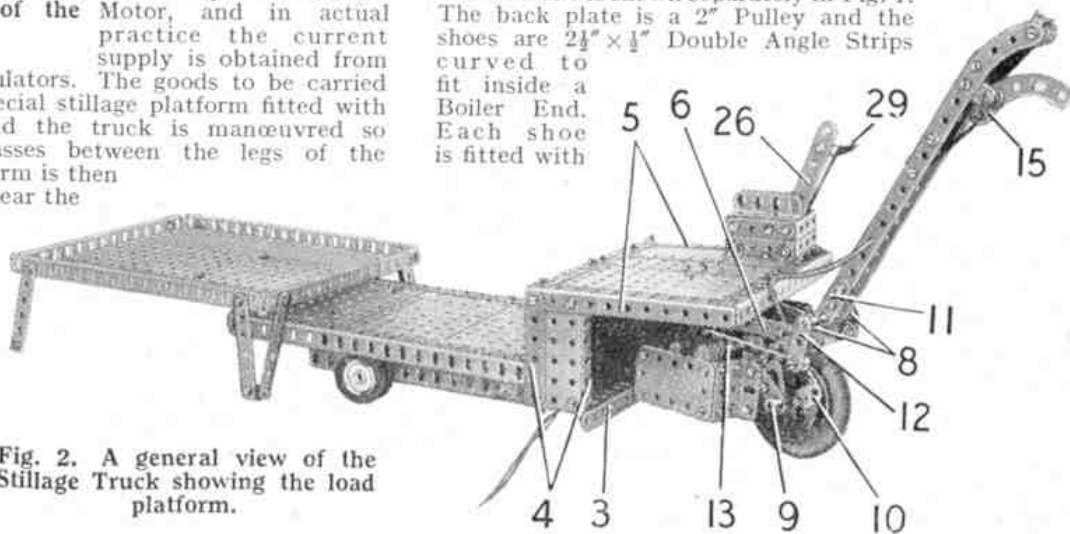


Fig. 2. A general view of the Stillage Truck showing the load platform.

an Angle Bracket, and the Angle Brackets are pivoted to the back plate by a lock-nutted bolt. The operating cam is a Collar placed between the free ends of the shoes. A $\frac{3}{4}"$ Bolt is passed through a Fishplate 10 and is held tightly by a nut. The Bolt is then inserted in a hole in the back plate, fitted with a second nut and screwed into the tapped hole of the Collar. The nut is tightened against the Collar to fix it securely on the Bolt, and a small rubber band looped round the free ends of the shoes serves to hold them against the Collar. The $2"$ Pulley is fixed by its set-screw on the front wheel axle.

The control handle consists of two $7\frac{1}{2}"$ Angle Girders extended by a $1\frac{1}{2}"$ Strip and a Crank 11 at one end, and by two $2\frac{1}{2}"$ Curved Strips and a Formed Slotted Strip at the other end. The handle is fixed by the Grub Screw in the Crank to a $2"$ Rod mounted in the Fishplates 8, and a

second Crank 12 is also fixed on the Rod. A Rod 13 is pivoted to Crank 12 by a bolt screwed into a Collar, and the other end of the Rod is similarly pivoted to a Bell Crank 14. The Bell Crank is loosely mounted on a $\frac{1}{2}"$ Bolt held by two nuts in a $1\frac{1}{2}"$ Strip, and the Strip is bolted tightly to the Electric Motor as shown in Fig. 5. A Double Bracket attached to the free arm of the Bell Crank engages the Electric Motor switch, so that when the handle is depressed the Motor drives the truck forward, and when it is raised the direction of the drive is reversed.

The brake is arranged so that it is "on" until the brake lever is lifted. The lever

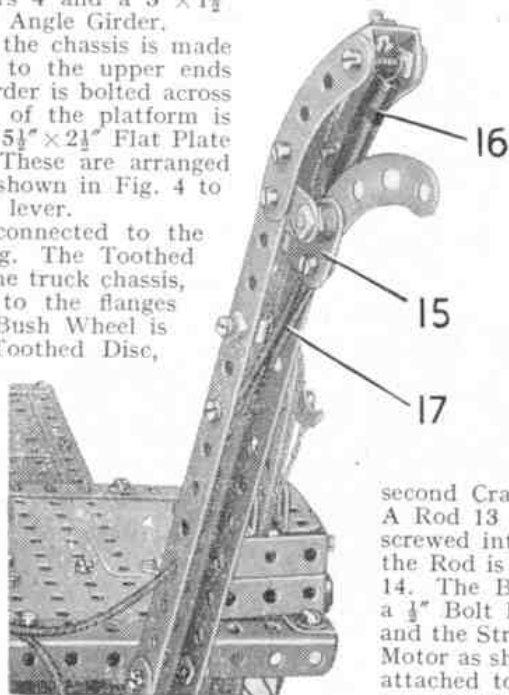


Fig. 3. A detail view of the control handle showing the arrangement of the brake lever.

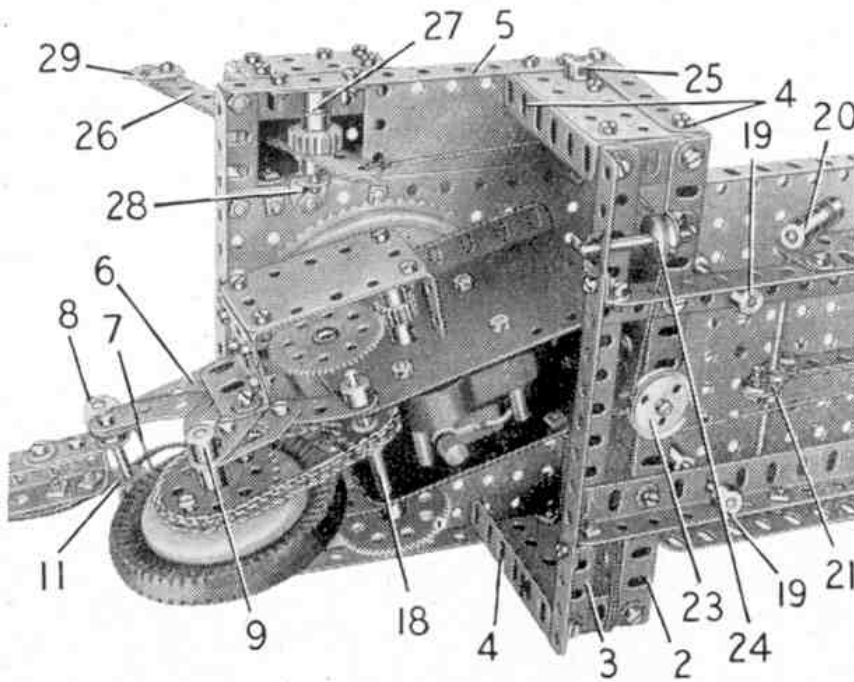


Fig. 4. The driving Motor and reduction gearing.

is a 2 1/2" Stepped Curved Strip fitted with a 1" Corner Bracket 15, and it pivots on a bolt lock-nutted to a Fishplate fixed to the main handle. The brake lever is connected to the Fishplate 10 by a length of flexible wire that passes through an outer sheath of Spring Cord. The Spring Cord is clamped in Collars attached by bolts to the front wheel framework and to the operating handle. The brake is held in the "on" position by a Tension Spring 16 bolted between the brake lever and the handle, and by a 2 1/4" Driving Band 17, also attached to the lever and the handle.

The drive to the front wheel is transmitted from the Motor by a 1/2" Pinion on the armature shaft to a 57-tooth Gear on a 2 1/2" Rod mounted in the Motor sideplates. This Rod is fitted also with a 1/2" Pinion that meshes with a 57-tooth Gear on a 2 1/2" Rod 18. A 3/4" Sprocket on Rod 18 is connected by Chain to the 1 1/2" Sprocket on the front wheel. The driving Gears on each side are enclosed in housings made from 2 1/2" x 1" Double Angle Strips bolted to 2 1/2" x 1 1/4" Flexible Plates. A 1 1/2" Angle Girder is bolted to the lugs at one end of each housing, and these Girders are used to attach the housings to the motor unit.

The chassis is fitted with a lifting platform made from two 9 1/2" and two 5 1/2" Angle Girders, and it is plated by three 5 1/2" x 3 1/4" Flat Plates. Four Rod Sockets are attached to the Plates, and each of them carries a 1 1/2" Rod that passes through the chassis of the truck and is fitted with a Collar 19.

The lifting platform is raised by four levers, each of which is a Coupling 20 fitted with a 1" Rod capped by a Collar. The levers are locked in pairs on 4 1/2" Rods mounted in 5 1/2" Flat Girders bolted to the chassis. The Rods carry Double Arm Cranks 21 between the Flat Girders, and these Cranks are connected together by a 5 1/2" Strip attached by lock-nutted bolts.

The platform lifting levers are operated by a length of Cord tied to the Cranks 21. This Cord passes round a 1/2" loose Pulley 22 and a 1" loose Pulley 23, both of which are free to turn on 1/2" Bolts lock-nutted to the chassis. The Cord is then taken round a 1/2" loose Pulley 24 mounted on a 1 1/2" Rod that is held by Spring Clips in Angle Girder 3 and in an Angle Bracket 2 bolted to Angle Girder 2. The Cord passes round a 1/2" fixed Pulley held on a 1 1/2" Rod mounted in one side of the truck and in a Double Bent Strip bolted to the side. The Rod is held in place by a Collar indicated at 25 in Fig. 4.

The Cord is tied finally to the lower end of a lever 26, made from three 5 1/2" Strips. These Strips are pivoted on a 1 1/2" Rod fixed in a Double Arm Crank 27, and supported in an Angle Bracket 28. The Rod is fitted with a Ratchet Wheel, and a Pawl pivoted on a bolt lock-nutted to lever 26 engages with the teeth of the Ratchet. The Pawl is connected to a second Pawl 29 by a short length of wire, so that when the upper Pawl is lifted the lower one is raised clear of the Ratchet to release the lever and lower the lifting platform.

The lever 26 protrudes through a casing, one side of which consists of a Girder Bracket. This part is connected to two 2" Strips by four 1 1/2" x 1/2" Double Angle Strips, and two 2" Angle Girders are attached to the casing by Angle Brackets. The complete casing is connected to Angle Brackets bolted to the truck.

The trailing axle of the truck is a 5" Rod free to turn in the Angle Girders 1 of the chassis. The wheels are 1" Pulleys fitted with Motor Tyres, and they are fixed in pairs to each end of the 5" Rod.

The stillage platform is built up from two 5 1/2" x 3 1/4" Flat Plates and two 9 1/2" Strip Plates edged by 9 1/2" and 7 1/2" Angle Girders. It is supported by four legs, each of which is made from two 3" Strips connected at their lower ends by an Angle Bracket.

If required, a list of the parts necessary to build this model can be obtained from Information Service, Meccano Ltd., Binns Road, Liverpool 13.

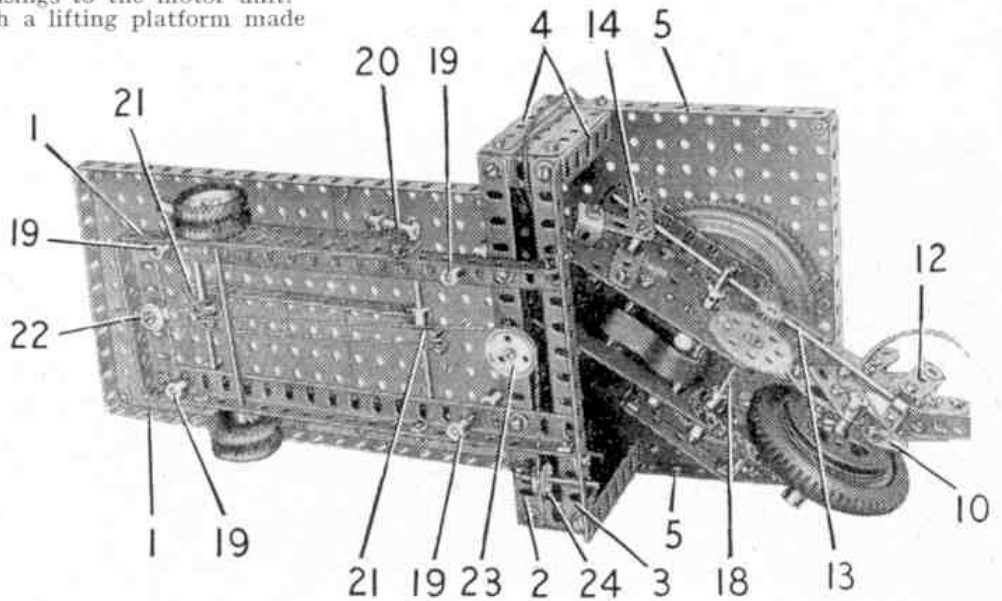


Fig. 5. This underneath view of the model shows the switch control mechanism and the layout of the Cord that operates the lifting platform,