

# Meccano Shovel Loader

## An Attractive Model for Outfit No. 4

CONSTRUCTION of the model is begun by making the chassis, which consists of a  $5\frac{1}{2}" \times 2\frac{1}{2}"$  Flanged Plate and a Flanged Sector Plate overlapped three holes and bolted together. Each side of the cab is made by fixing a  $3\frac{1}{2}"$  Strip 1 and a  $2\frac{1}{2}" \times 1\frac{1}{2}"$  Flexible Plate 2 to the Flanged Plate. The Flexible Plate is strengthened by a  $2\frac{1}{2}"$  Strip, and this is extended upward by two Fishplates that form the windscreen frame. The sides are connected

The top of the bonnet is attached to the  $2\frac{1}{2}" \times 1\frac{1}{2}"$  Flanged Plate by a  $\frac{3}{8}"$  Bolt, with three Washers on it for spacing purposes, and is connected to the Double Angle Strip 3 by an Angle Bracket. The bolt used to fix the top of the bonnet to the Angle Bracket supports also a  $2\frac{1}{2}"$  Strip 5, which projects three clear holes into the cab. The engine unit is represented by a U-section Curved Plate connected to a Semi-Circular Plate 6 by a  $\frac{1}{2}"$  Reversed Angle Bracket.

The rear wheels are 3" Pulleys and Road Wheels mounted on a  $1\frac{1}{2}"$  and a  $3\frac{1}{2}"$  Rod joined by a Rod Connector. The Rods are supported in Trunnions bolted underneath the chassis. The front wheels are fixed on a  $3\frac{1}{2}"$  Rod passed through a  $2\frac{1}{2}" \times \frac{1}{2}"$  Double Angle Strip 7, which is lock-nutted to a  $\frac{1}{2}"$  Reversed Angle Bracket bolted underneath the Flanged Sector Plate.

The steering column is a 4" Rod fitted with a Bush Wheel 8. The Rod is supported in Strip 5 and in the Flanged Plate, and is held in place by a Spring Clip. A length of Cord is wound four or five times round the lower end of the Rod, and each end is tied to the

Double Angle Strip 7 as shown in Fig. 2. A 1" Pulley fixed on the steering column prevents the Cord from slipping out of place.

The jib that supports the shovel arm consists of a  $5\frac{1}{2}"$  Strip 9 and a made-up strip 10 on each side, bolted to the cab. Strip 10 is formed by a  $5\frac{1}{2}"$  and a  $2\frac{1}{2}"$  Strip overlapped three holes. The Strips on each side are connected at their upper ends by a  $1\frac{1}{2}"$  Rod fitted with Spring Clips. A 1" Pulley 11 is mounted freely on the Rod between the Strips.

Each side of the shovel is formed by two  $2\frac{1}{2}" \times 1\frac{1}{2}"$  Triangular Flexible Plates arranged as shown, and the sides are connected by  $2\frac{1}{2}" \times \frac{1}{2}"$  Double Angle Strips. An Angle

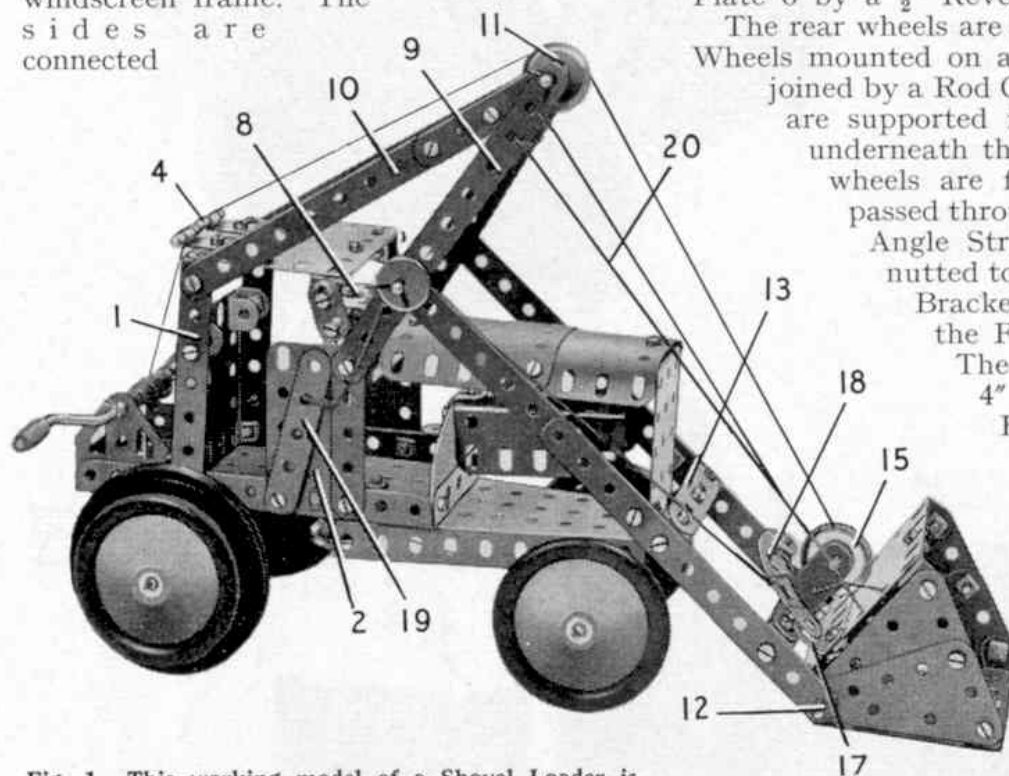


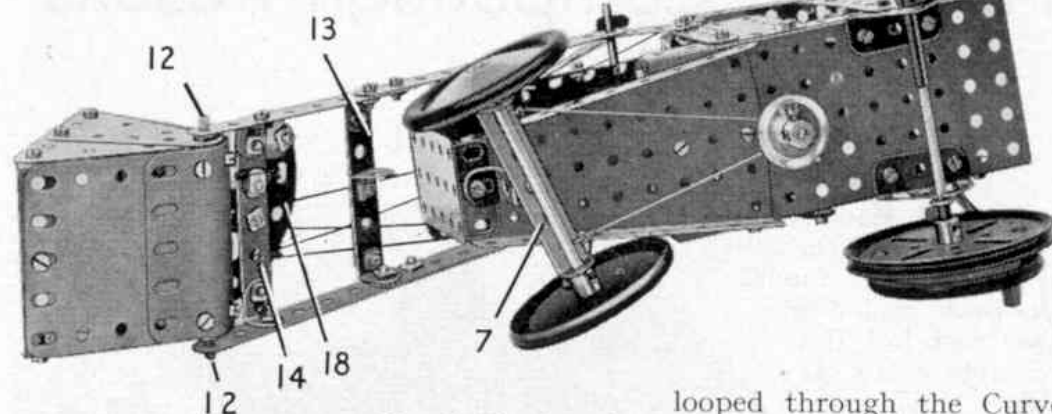
Fig. 1. This working model of a Shovel Loader is designed for construction with parts in a No. 4 Outfit.

by  $2\frac{1}{2}" \times \frac{1}{2}"$  Double Angle Strips bolted between the Strips 1 and between the upper pair of Fishplates, and by a similar Double Angle Strip 3.

The cab roof is a  $2\frac{1}{2}" \times 2\frac{1}{2}"$  Flexible Plate, and the back of the cab is another  $2\frac{1}{2}" \times 2\frac{1}{2}"$  Flexible Plate bolted to Double Brackets fixed to the Strips 1. Two Right Angle Rod and Strip Connectors are attached to the rear edge of the roof, and these support a 2" Rod 4.

The radiator is a  $2\frac{1}{2}" \times 1\frac{1}{2}"$  Flanged Plate bolted to the narrow end of the Flanged Sector Plate. The top of the bonnet is formed by two  $1\frac{1}{8}"$  radius Curved Plates overlapped two holes and bolted together.

Fig. 2. The Shovel Loader seen from below. The arrangement can be seen clearly in this view.



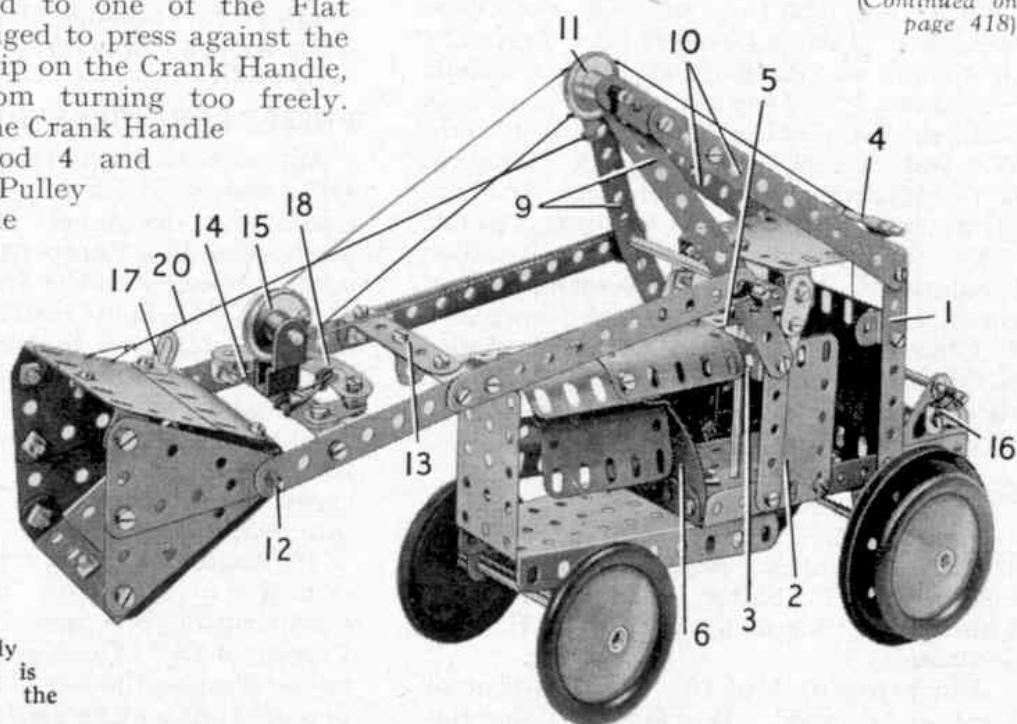
Bracket is placed on a  $\frac{3}{8}$ " Bolt 12 passed through the Triangular Flexible Plates on each side and fixed in them by a nut. The Angle Brackets support a U-section Curved Plate and this is connected to the Double Angle Strips by two  $2\frac{1}{2} \times 2\frac{1}{2}$ " Flexible Plates.

Each side of the arm supporting the shovel is made from two  $5\frac{1}{2}$ " Strips overlapped five holes. The sides are connected by two  $2\frac{1}{2}$ " Strips 13 and 14. Strip 13 is bolted to an Angle Bracket and a  $1\frac{1}{2} \times \frac{1}{2}$ " Double Angle Strip, while Strip 14 is attached to two Angle Brackets. A Stepped Bent Strip is fixed to Strip 14 and a 1" Pulley 15 is fixed on a 1" Rod mounted in it. The arm pivots on a  $3\frac{1}{2}$ " Rod held by Spring Clips in the Strips 9.

The shovel is raised or lowered by turning a Crank Handle mounted in Flat Trunnions bolted to the chassis. An Angle Bracket 16 bolted to one of the Flat Trunnions is arranged to press against the lugs of a Spring Clip on the Crank Handle, to prevent it from turning too freely. Cord fastened to the Crank Handle is taken over Rod 4 and Pulley 11, round Pulley 15, and is tied to one of the Strips 9.

The catch to lock the shovel in its loading position is made from an Angle Bracket 17 that engages under one end

Fig. 3. In this view the operating arm of the Shovel Loader is partly raised, and the catch is released to discharge the contents of the shovel.



of a  $2\frac{1}{2}$ " Stepped Curved Strip 18. The Curved Strip is lock-nutted to a Fish-plate, which is bolted to Strip 14. A  $2\frac{1}{2}$ " Driving Band is

looped through the Curved Strip and is bolted to Strip 14, so that normally it pulls the Curved Strip against the Stepped Bent Strip. The catch is released by operating a lever 19, lock-nutted to one side of the cab. Cord tied to the lever is passed over the Rod on which the shovel arm pivots, and is tied to the Curved Strip 18. When the shovel arm is raised, releasing the catch allows the shovel to swing down to discharge its load. The shovel is returned to its working position automatically as the arm is lowered by a Cord 20. This Cord must be taut when the shovel is at ground level with the catch engaged.

Parts required to build the Shovel Loader: 8 of No. 2; 2 of No. 3; 7 of No. 5; 5 of No. 10; 2 of No. 11; 8 of No. 12; 1 of No. 15b; 3 of No. 16; 1 of No. 17; 2 of No. 18a; 1 of No. 18b; 2 of No. 19b; 1 of No. 19g; 3 of No. 22; 1 of No. 24; 6 of

(Continued on page 418)

**Charcoal Burning Today**—(Continued from page 371)

In modern methods in which portable kilns are used the metal walls serve to keep out unwanted air, but they do it more efficiently than the earth covering of the older way and allow of easier control.

It was during the last World War that these huge iron cylinders, constructed in two separate 4 ft. high rings with a lid section and chimney on top, were first introduced, and they are employed in most charcoal burning districts. There are four chimneys to each kiln, and inside are eight extra air pipes leading from its heart. Timber is piled into the kiln, the heap is lighted, and the lid is placed on top. The chimney opening is partly blocked with a metal plate once the kiln is burning well, and combustion is thus well controlled.

The kilns hold three tons of wood and the operation covers approximately three days, for while the burning may be completed in a single day, two or more days are needed for the hearth to cool.

Charcoal is black in hue and shows a bright metallic lustre. In a first-class sample the original logs are practically unbroken, and you may still discern the structure of their grain. Incidentally, small pieces of charcoal are quite clean to handle.

Kilns and retorts also are used in charcoal making that allow the recovery of many valuable products that are lost when the methods already described are used. These receptacles are fitted with condensers, the chief product being Stockholm tar or creosote, which is used for preserving timber. More recently low temperature distillation has been introduced with the aim of producing spirits and oils of various kinds, but the quantity and the quality of the charcoal is then reduced.

**Castles in the Air**—(Continued from page 384)

contractors at a later date had a "Brindley" type aqueduct over the Ouse, but poor workmanship accelerated its collapse in a storm soon after erection and a temporary wooden trough was erected until the present 60 ft. long iron trough arrived from Ketley Bank Iron Works in Shropshire. Remains of the piers of the original aqueduct may be seen in the Ouse below.

In British Canal history one of the lesser known and more obscure projects was the Tub boat system of S.W. England, the leading engineer being James Green of Exeter. Two of his fine aqueducts remain, one being at Veala, where the Bude Canal crosses the River Tamar, and the other at Beam, near Torrington. Beam aqueduct has now been merged into the driveway to Beam House, its five round-headed arches with ornamental balustrades having survived since 1825 in virtually untouched condition.

Smaller aqueducts exist up and down the country wherever canals have been constructed, a fine example by Telford being seen at Stretton, where the Shropshire Union Canal crosses Watling Street. It is a common sight to witness narrow boats sailing by sedately far above the hurry and rush of modern motor traffic. Each of these smaller aqueducts is worthy of closer inspection, for few if any are exactly alike and yet all have played a vital, if small, part in the advancement of civil engineering to its twentieth century achievements.

**Meccano Shovel Loader**—(Continued from page 407)

No. 35; 73 of No. 37a; 66 of No. 37b; 12 of No. 38; 2 of No. 38d; 1 of No. 40; 1 of No. 44; 1 of No. 48; 6 of No. 48a; 1 of No. 51; 1 of No. 52; 1 of No. 54; 1 of No. 90a; 5 of No. 111c; 2 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 176; 1 of No. 186; 4 of No. 187; 2 of No. 188; 4 of No. 190; 2 of No. 199; 2 of No. 200; 2 of No. 212a; 1 of No. 213; 1 of No. 214; 4 of No. 221.

**"TRAINS ILLUSTRATED SUMMER ANNUAL"**

Edited by G. FREEMAN ALLEN

(Ian Allan, price 4/6)

*Trains Illustrated Summer Annual* is intended mainly for holiday reading, but it is a valuable reference work apart from this because of the variety of subjects covered. Produced somewhat on the lines of the popular monthly *Trains Illustrated*, but with a larger size page, the Annual is an "extra" in which several leading railway authors cover such different territory as the Highland line to Kyle of Lochalsh and the China Clay district of Cornwall, Ireland and the Isle of Man are visited, and there is an account of a footplate trip over the Midland main line from London to Carlisle. The reader is also given an insight into the working of the Kent Coast holiday trains, and details of the various routes to the Continent. Some peculiarities of American railroad timetables are described, and to complete the variety the Cambrian Lines of the Western Region, and locomotive chimneys, are dealt with.

The articles are liberally supported by photographs, most of which are of excellent quality. We recommend the book as a worthy addition to any railway library, consisting as it does of 64 pages of absorbing reading and photographs.

**"ABC ROYAL AIR FORCE"**

By JOHN W. R. TAYLOR

(Ian Allan, price 2/6)

In April last the Government published a White Paper on Defence in which they outlined the re-shaping of the country's defence programme during the next five years to keep abreast of nuclear developments in the military sphere. The new policy does not involve the sudden, wholesale scrapping of our present military aircraft, and a glance through this excellent book shows the wide range of machines in service with the Royal Air Force. These aircraft are dealt with in alphabetical order of the names of their makers, and in the case of each major type there is a half-tone illustration, three-view silhouette, main specification details and a paragraph recording briefly the Service history of the type. About a dozen types of lesser importance, but still being used by the R.A.F. at home and overseas, also are illustrated, with an accompanying short note on their service.

A chapter explaining the organisation of the Royal Air Force gives a list of the Home and Overseas Commands and the Groups in them. The different branches of training, and the conditions of entry, are explained. There are illustrations of the badges and insignia of the different ranks, and useful notes on the varied Service colours and markings of R.A.F. aircraft.

**THIS MONTH'S SPECIAL ARTICLES**

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