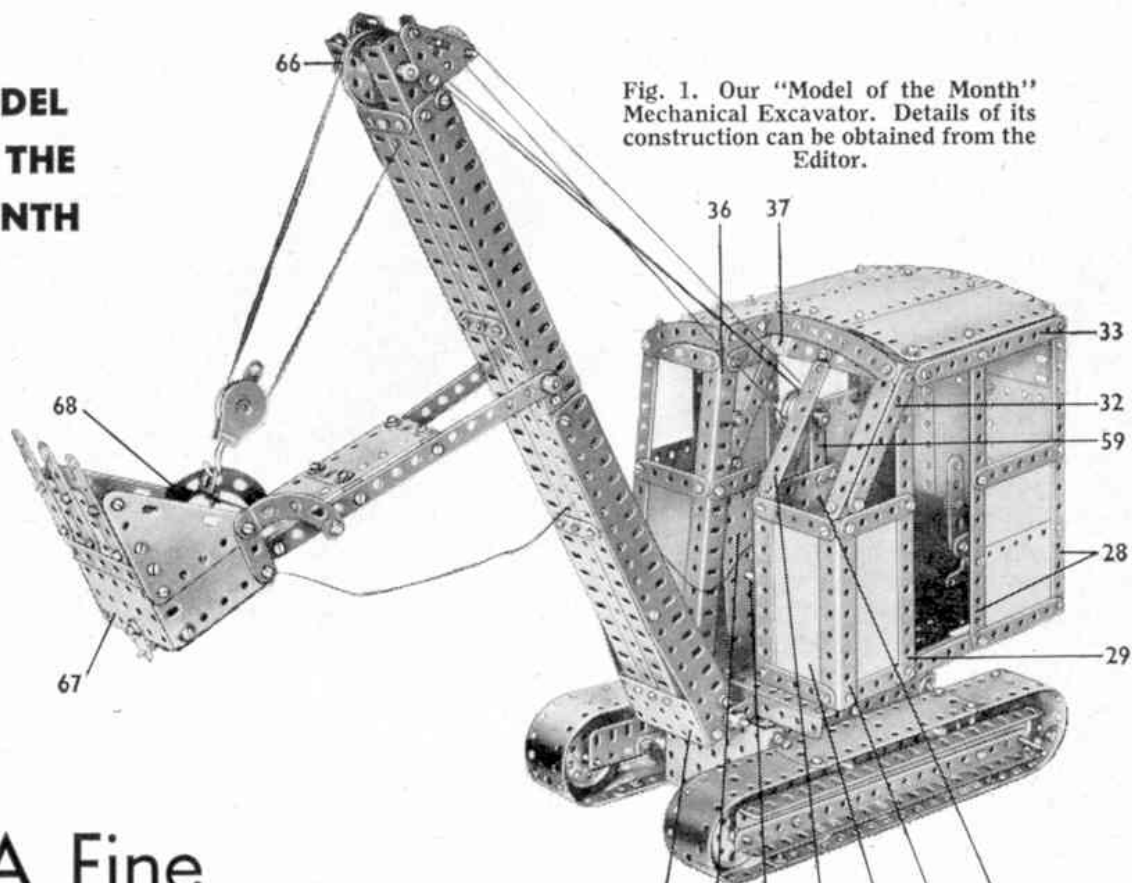
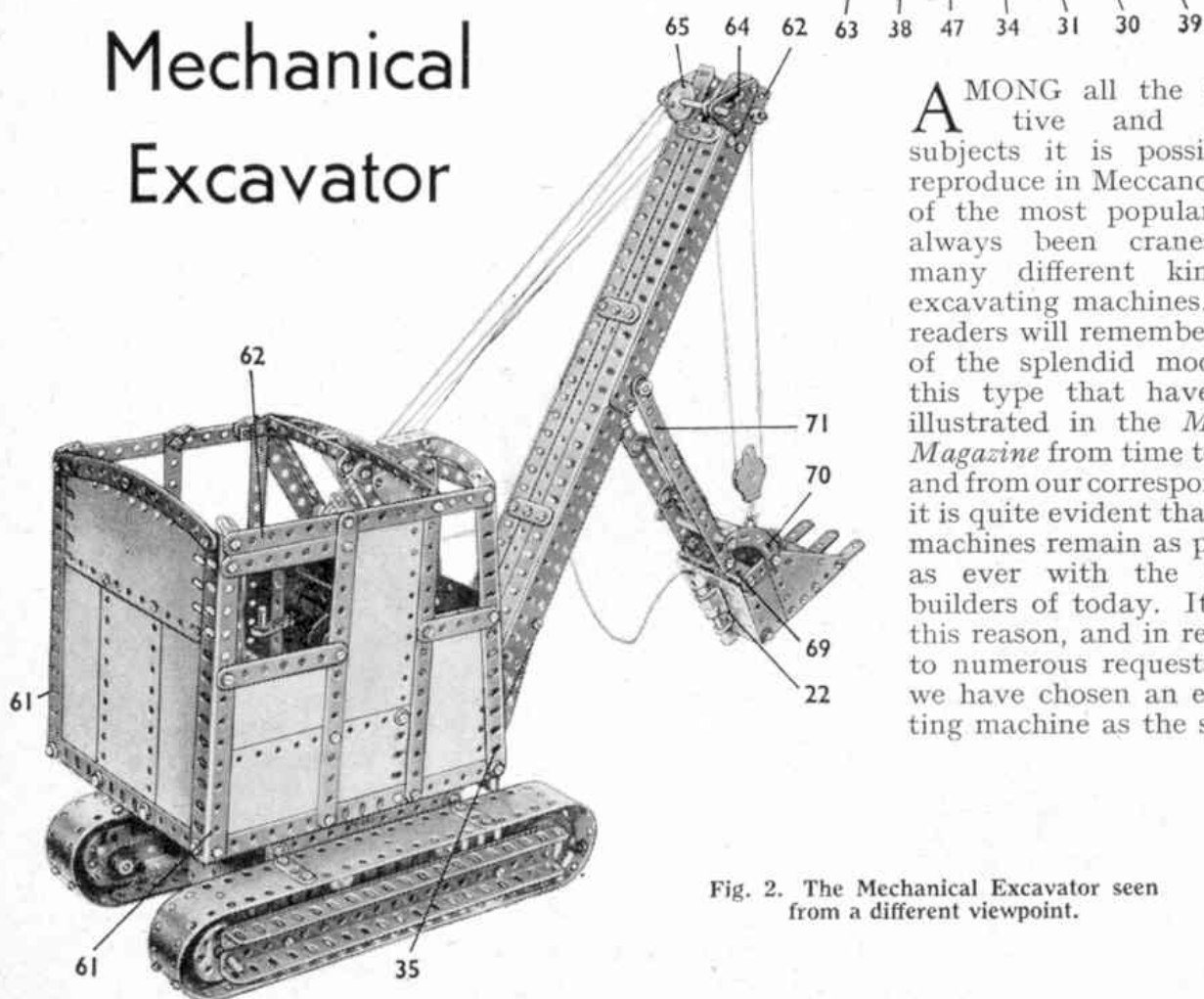


MODEL OF THE MONTH



A Fine Mechanical Excavator



AMONG all the attractive and varied subjects it is possible to reproduce in Meccano, some of the most popular have always been cranes and many different kinds of excavating machines. Older readers will remember some of the splendid models of this type that have been illustrated in the *Meccano Magazine* from time to time, and from our correspondence it is quite evident that these machines remain as popular as ever with the model-builders of today. It is for this reason, and in response to numerous requests, that we have chosen an excavating machine as the subject

Fig. 2. The Mechanical Excavator seen from a different viewpoint.

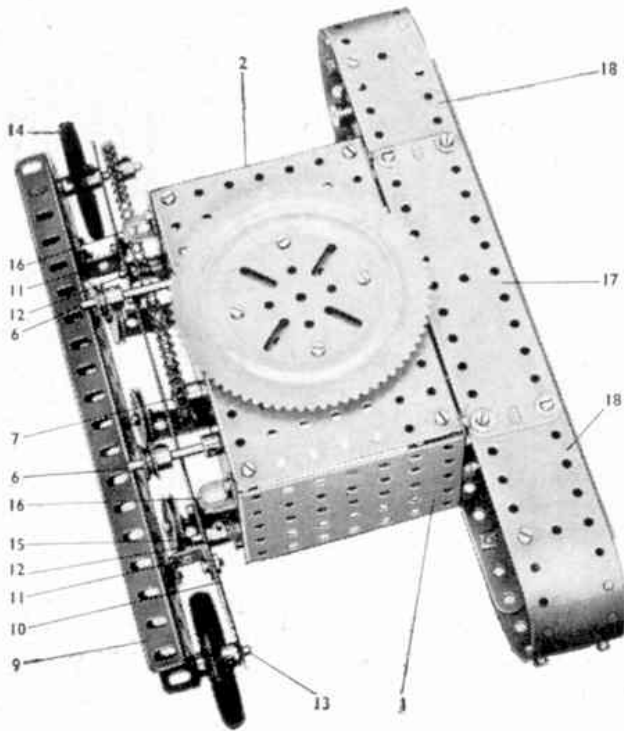


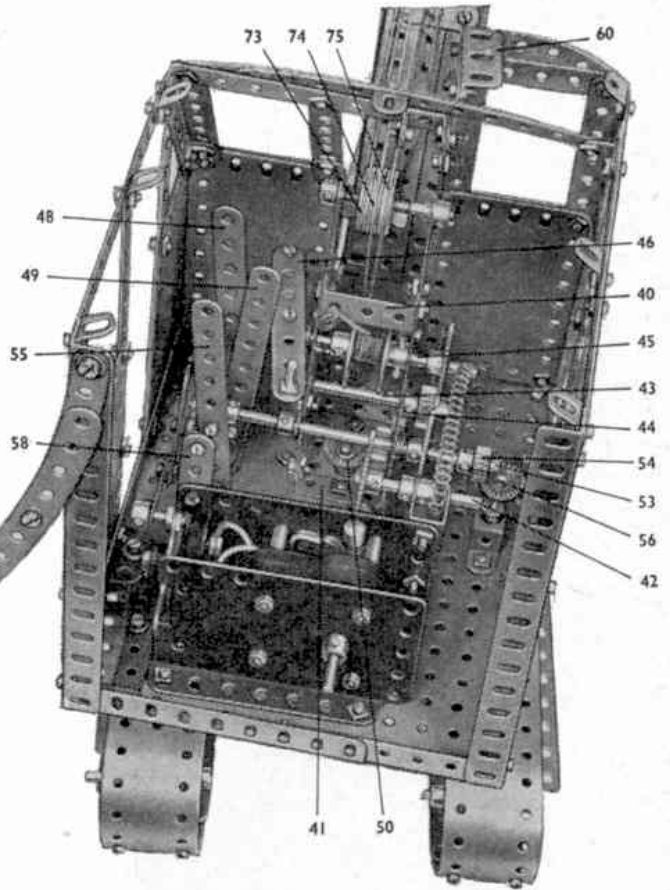
Fig. 3. The base on which the superstructure swivels, with one of the tracks removed to show the drive to the wheel axles.

Meccano Ltd., Binns Road, Liverpool 13, enclosing a 3d. stamp for postage.

Readers living in Canada, Australia, New Zealand, South African, Ceylon, Italy, Rhodesia and the United States of America, should write to our main agents for those countries for their copies of the instructions, also, of course, enclosing suitable stamps for postage.

We advise all who wish to build this model to apply for the instructions immediately they receive this issue, as supplies are not unlimited.

Fig. 4. The interior of the cab showing arrangement of the Motor and gear mechanism.



for the "Model of the Month" illustrated complete in the pictures on this and the facing page.

This Excavator, or Mechanical Shovel, as these machines are sometimes called, carries out all the essential movements of a real machine and it derives its motive power from either an E15R or an E20R type Electric Motor, whichever happens to be available.

As usual with these "Model of the Month" subjects, any reader who wishes to build the model can obtain the complete instructions simply by writing to the Editor, *Meccano Magazine*,

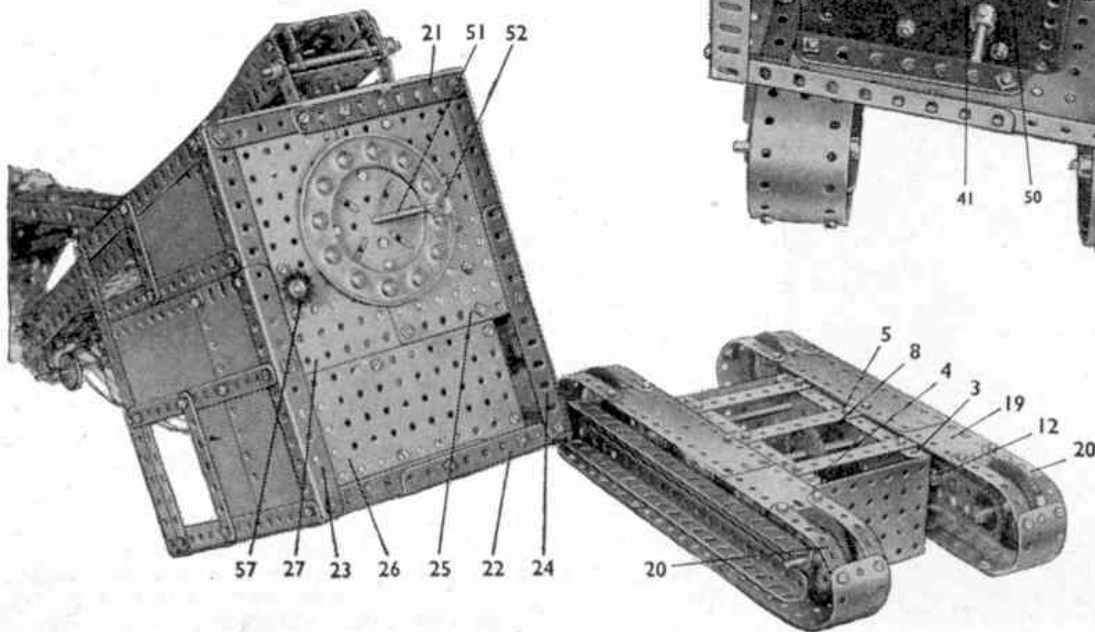


Fig. 5. On the left is the underside of the cab and on the right is shown the wheeled base with part of the casing removed.

MODEL OF THE MONTH.

Mechanical Excavator.

Illustrated in October, 1960, issue of the Meccano Magazine.

Base and Creeper Track.

Bolt two $3\frac{1}{2}$ " x $2\frac{1}{2}$ " Flanged Plates 1 and 2 to the ends of two $5\frac{1}{2}$ " x $2\frac{1}{2}$ " Flanged Plates 3 and 4. Three $5\frac{1}{2}$ " x $\frac{1}{2}$ " Double Angle Strips 5, with 1" loose Pulley Wheels attached to the lugs by $\frac{3}{8}$ " Bolts, are secured to the bottom flanges of the Plates 3 and 4. Two $6\frac{1}{2}$ " Rods 6 are passed through the plates, each carrying two $\frac{1}{2}$ " Pulleys and two Collars to support the imitation track. A $4\frac{1}{2}$ " Rod 7 has a 1" Sprocket Wheel at each end and a $1\frac{1}{2}$ " Bevel Wheel 8, a Coupling and a Collar near the centre. On the top flanges of the Plates 3 and 4, bolt a $5\frac{1}{2}$ " x $3\frac{1}{2}$ " Flat Plate to which has been bolted a 4" Ball Thrust Race Toothed Disc, spaced with a Collar on each of the $\frac{3}{8}$ " Bolts. Four Angle Brackets 16 are bolted to the sides of the Plates 3 and 4. Two $9\frac{1}{2}$ " Angle Girders 9 are secured to a $9\frac{1}{2}$ " Flat Girder to form a U-section girder. Another $9\frac{1}{2}$ " Flat Girder 10, is attached to the U-girder by two Double Brackets 11. At the same time fix the Double Arm Cranks 12 in position. Before placing the Cranks on the Rod, four spacing Washers are required on each side. A $1\frac{1}{2}$ " Pulley with Tyre is secured on a 1" Rod 13 with a Collar. The driven wheels 14 are mounted on a 2" Rod, together with a 1" Sprocket Wheel that is driven by Chain from the 1" Sprocket Wheel on Rod 7. The units are fastened to the base by passing a 5" Rod 15 through the centre of the end holes of the Plates 3 and 4. To the Angle Brackets 16, bolt a $9\frac{1}{2}$ " Strip covered over by three $5\frac{1}{2}$ " x $1\frac{1}{2}$ " Flexible Plates 17 and 18. Another $9\frac{1}{2}$ " Strip is bolted to the centre Double Angle Strip 5, with two $5\frac{1}{2}$ " x $1\frac{1}{2}$ " Flexible Plates overlapped seven holes. The ends of the Flexible Plates 18 and 19 are connected together by 3" Strips 20, bent round, and allowing the Tyres to protrude as shown.

Cab Base.

This is a $8\frac{1}{2}$ " x $6\frac{1}{2}$ " rectangle, built with compound Angle Girders, 21, 22, 23 and 24, and filled in with three $5\frac{1}{2}$ " x $3\frac{1}{2}$ " Flat Plates 25, 26 and 27. Bolt a Flanged Disc underneath the Flat Plates in the position shown. Three upright $7\frac{1}{2}$ " Strips 28 and 29 are bolted to the Angle Girder 24, filling in the

space between Strips 28 with two $3\frac{1}{2}$ " x $2\frac{1}{2}$ " Flexible Plates. A $4\frac{1}{2}$ " Angle Girder 30 is attached to the front of the Angle Girder 24 with a $4\frac{1}{2}$ " x $2\frac{1}{2}$ " Flexible Plate to join it to the Strip 29. Another $4\frac{1}{2}$ " x $2\frac{1}{2}$ " Flexible Plate 31, with two $2\frac{1}{2}$ " Strips and a $4\frac{1}{2}$ " Angle Girder is bolted to the Angle Girder 30. The $4\frac{1}{2}$ " Angle Girders are extended by Obtuse Angle Brackets and $3\frac{1}{2}$ " Strips, which are secured to a $3\frac{1}{2}$ " x $\frac{1}{2}$ " Double Angle Strip, extended with a Double Bracket. The $3\frac{1}{2}$ " Strip 32 has a Fishplate at each end, one to secure it to the Angle Girder 30, and the other to extend the $5\frac{1}{2}$ " Strip 33. It will be seen that the inner $3\frac{1}{2}$ " Strip 34 is attached to the Double Angle Strip by gripping the end of the Strip by a Washer. A $7\frac{1}{2}$ " Angle Girder 35 is bolted to the Angle Girder 23, and is connected by three $2\frac{1}{2}$ " Strips, a $2\frac{1}{2}$ " Curved Strip, and a $4\frac{1}{2}$ " x $2\frac{1}{2}$ " Flexible Plate, to the $7\frac{1}{2}$ " Angle Girder 36, which is attached to the base by an Angle Bracket. A 2" Strip supports the Angle Girder 36 to the Double Bracket 37, and a $3\frac{1}{2}$ " Strip is gripped by a Washer to the Angle Girder. Two $4\frac{1}{2}$ " x $2\frac{1}{2}$ " Flat Plates 38 and 39 are bolted to the inside Angle Girders, and held rigid by two $1\frac{1}{2}$ " x $\frac{1}{2}$ " Double Angle Strips 40 and 41, the latter being bolted to the base.

Motor Drive and Gear Box.

Fasten an E20R(S) or E15R Electric Motor to the Flat Plate 26. To the Motor side plate, bolt a Channel Bearing, spaced away with Washers. A Worm Wheel on the Motor shaft, drives a 57-toothed Gear Wheel on a $2\frac{1}{2}$ " Rod 42, carrying a $\frac{3}{4}$ " Sprocket Wheel and a Collar, and which is mounted in the Channel Bearing. On a 3" Rod 43 mounted in the fifth hole up from the base and the second hole from the end of the Plates 38 and 39 place a $\frac{3}{4}$ " Pinion 44, a $1\frac{1}{2}$ " Sprocket Wheel and a Collar. Connect the Sprocket Wheels with Chain. A $3\frac{1}{2}$ " Rod 45 mounted above the Rod 43, has two Bush Wheels and a 50-toothed Gear Wheel secured to it, in such positions as to allow sufficient side movement of the Rod for the Gear Wheel to disengage with the Pinion 44. For the Bush Wheel nearest the Plate 38 a nut and bolt is fixed in the Plate 38 to act as a brake by engaging Bolts in the Bush Wheel boss when the Rod is slid in that direction. A loose Collar, between two fixed Collars is pivotally attached by a nut and bolt to the $3\frac{1}{2}$ " Strip 46, which is lock-nutted to a 1" x 1" Angle Bracket attached to the Plate 39. A Threaded Pin is placed in the end hole

of the Strip.

Another similar Rod 47, fitted with two Bush Wheels and a 50-toothed Gear Wheel, is placed in the fifth hole up, and the second hole from the front end of the Plates 38 and 39, and engages with the Pinion 44. A lever 48, lock-nutted to an Angle Bracket bolted to the base, operates the Rod 47. Below the Rod 43 is another Rod fitted with a 50-toothed Gear Wheel and a $\frac{1}{2}$ " Pinion. This Rod can be moved endways by means of the lever 49. The Gear Wheel is in constant mesh with the Pinion 44, and is adjusted to allow the $\frac{1}{2}$ " Pinion to engage and disengage with the $\frac{3}{4}$ " Contrate Wheel 50, secured to the Rod 51. Rod 51 also carries a $\frac{1}{2}$ " Bevel Wheel 52, which is adjusted to engage with the Bevel Wheel 8 in the base of the model. The Rod 51 is mounted at its lower end in the Coupling on Rod 7 which is held in position by a Collar. Washers are required to make the Contrate Wheel 50 engage with the $\frac{1}{2}$ " Pinion. Two $1\frac{1}{2}$ " Strips are bolted to the Plates 38 and 39 to form a bearing for the 5" Rod 53. A $\frac{1}{2}$ " Pinion 54 and a 50-toothed Gear Wheel, are secured on the Rod which can be moved endways by a lever 55, which is pivotally connected by a Nut and Bolt to a loose Collar placed between two fixed Collars on the Rod. The $\frac{1}{2}$ " Pinion 54 engages with a $\frac{3}{4}$ " Contrate Wheel 56 secured to a Rod carrying a $\frac{3}{4}$ " Sprocket Wheel 57 that is connected by Chain to the Ball Thrust Race Toothed Disc. A Threaded Pin secured to the Motor starting lever, is linked by a $1\frac{1}{2}$ " Strip lock-nutted to a $2\frac{1}{2}$ " Strip, which in turn is lock-nutted to an Angle Bracket attached to the Motor side plate by a $1\frac{1}{2}$ " Strip 58. Two $2\frac{1}{2}$ " Strips 59 are secured to the Plates 38 and 39 and they support a 2" Rod fitted with three 1" loose Pulleys.

Completion of the Cab.

The Angle Girder 36 is extended by a Fishplate which supports a $1\frac{1}{2}$ " Angle Girder 60. Two $7\frac{1}{2}$ " Angle Girders 61, attached to the base, are connected at the top by two $5\frac{1}{2}$ " Curved Strips overlapped nine holes. Four $5\frac{1}{2}$ " x $2\frac{1}{2}$ " Flexible Plates fill in the back of the cab. A $7\frac{1}{2}$ " Strip 62 connects the Angle Girders 61 and 35. The side is filled in with two $5\frac{1}{2}$ " x $2\frac{1}{2}$ " one $4\frac{1}{2}$ " x $2\frac{1}{2}$ " and a $3\frac{1}{2}$ " x $2\frac{1}{2}$ " Flexible Plate, supported by two $7\frac{1}{2}$ ", one $2\frac{1}{2}$ ", and two $3\frac{1}{2}$ " Strips.

The roof of the cab is made by bolting three $5\frac{1}{2}$ " x $2\frac{1}{2}$ " and two $2\frac{1}{2}$ " x $1\frac{1}{2}$ " Flexible Plates to the Obtuse Angle Brackets on the sides of the cab.

The Jib.

Two $18\frac{1}{2}$ " Angle Girders are bolted to a $2\frac{1}{2}$ " x $1\frac{1}{2}$ " Flanged Plate 63, with Strips placed between them, and held by $1\frac{1}{2}$ " Strips. Another similar unit is built, and they are connected together by four $9\frac{1}{2}$ " Flat Girders, two on either side. $1\frac{1}{2}$ " Corner Brackets 64, bolted to the $18\frac{1}{2}$ " Angle Girders support a 2" Rod carrying a 1" loose Pulley Wheel 65. The other pair of $18\frac{1}{2}$ " Angle Girders form the bearing for the $1\frac{1}{2}$ " Pulley Wheel 66 on a 2" Rod held in position by Collars. The jib is attached to the cab by a $3\frac{1}{2}$ " Rod placed through a $2\frac{1}{2}$ " x 1" Double Angle Strip, bolted to the Angle Girders 21.

The Digger Bucket.

The bottom of the bucket is built with two $2\frac{1}{2}$ " x $1\frac{1}{2}$ " Flanged Plates 67 and a $2\frac{1}{2}$ " x $\frac{1}{2}$ " Double Angle Strip. Each side is built by bolting a $2\frac{1}{2}$ " x $2\frac{1}{2}$ " Triangular Flexible Plate and a $2\frac{1}{2}$ " x $1\frac{1}{2}$ " Flexible Plate to the Flanged Plates 67. Two $2\frac{1}{2}$ " x $\frac{1}{2}$ " Double Angle Strips 68 and 69 are secured to the top of the Flexible Plates, supported by a $1\frac{1}{2}$ " Strip and a $2\frac{1}{2}$ " Stepped Curved Strip 70. A $1\frac{1}{2}$ " x $\frac{1}{2}$ " Double Angle Strip is attached to the Double Angle Strip 69, and supports two $7\frac{1}{2}$ " Strips 71, which swivel on a $2\frac{1}{2}$ " Rod placed in the $18\frac{1}{2}$ " Angle Girders forming the jib. Two $2\frac{1}{2}$ " x $1\frac{1}{2}$ " Flexible Plates are bolted between the Strip 71. The Curved Strips 70 are attached to the $7\frac{1}{2}$ " Strip 71, by a 3" Screwed Rod and four Nuts. Three $2\frac{1}{2}$ " Strips are bolted to the front $2\frac{1}{2}$ " x $1\frac{1}{2}$ " Flanged Plates, to represent the teeth. An Angle Bracket is bolted to the centre of the Double Angle Strip 68 to anchor the Single Pulley Block. The back of the bucket is a $2\frac{1}{2}$ " x $2\frac{1}{2}$ " Flat Plate, hinged to the Double Angle Strip 69.

A $1\frac{1}{2}$ " Double Angle Strip 72, bolted to the Flat Plate, carries a 2" Rod which is spring loaded by a Compression Spring and Collar. An End Bearing is placed on the end of this Rod. The lower end of the Rod projects into a Fishplate bolted to the Flanged Plate 67. A short length of cord running from the cab and attached to the End Bearing is used to operate the bucket unloading mechanism.

A length of Cord is attached to the centre strip of the jib by a Washer (on the inside) passed around the single Pulley Block, over Pulley 66 at the jib head, over the centre loose Pulley 74 in the cab, and finally is tied

to the winding drum 47.

Another length of Cord is attached to the Corner Bracket 64 passed around the Pulley 73, around the Pulley 65 and around the other Pulley 75, and finally is tied to the winding drum on Rod 45.

Parts required to build The Mechanical Excavator:- 2 of No. 1; 4 of No. 1a; 7 of No. 1b; 3 of No. 2; 3 of No. 2a; 9 of No. 3; 12 of No. 4; 13 of No. 5; 1 of No. 6; 9 of No. 6a; 4 of No. 7a; 4 of No. 8a; 4 of No. 8b; 4 of No. 9; 6 of No. 9a; 2 of No. 9c; 3 of No. 10; 5 of No. 11; 15 of No. 12; 1 of No. 12b; 10 of No. 12c; 2 of No. 14; 3 of No. 15; 2 of No. 15a; 1 of No. 15b; 1 of No. 16; 4 of No. 16a; 1 of No. 16b; 5 of No. 17; 2 of No. 18b; 5 of No. 21; 10 of No. 22a; 4 of No. 23a; 2 of No. 24; 1 of No. 25b; 2 of No. 26a; 4 of No. 27; 1 of No. 27a; 2 of No. 29; 1 of No. 30a; 1 of No. 30c; 1 of No. 32; 2 of No. 35; 320 of No. 37a; 310 of No. 37b; 80 of No. 38d; 1 of No. 40; 1 of No. 45; 7 of No. 48; 3 of No. 48a; 2 of No. 48b; 3 of No. 48d; 4 of No. 51; 2 of No. 52; 4 of No. 52a; 2 of No. 53; 2 of No. 53a; 40 of No. 59; 4 of No. 62b; 1 of No. 72; 1 of No. 80c; 4 of No. 89; 2 of No. 90a; 1 of No. 94; 1 of No. 95a; 4 of No. 96; 2 of No. 96a; 6 of No. 103a; 1 of No. 103h; 2 of No. 103k; 10 of No. 111a; 2 of No. 114; 1 of No. 115; 1 of No. 120b; 2 of No. 133; 4 of No. 142d; 1 of No. 151; 1 of No. 160; 1 of No. 166; 1 of No. 168; 6 of No. 188; 1 of No. 189; 3 of No. 190a; 4 of No. 191; 9 of No. 192; 1 of No. 221; 2 of No. 223; 1 E15R Electric Motor.