BRINGING A TOUCH of undisguised beauty to the cover of last December's MM was a striking picture of an early American railway locomotive modelled in Meccano. It was, as mentioned in the cover caption, the winning model from the 1972 Meccano Globe-trotter Competition and the same model is now illustrated here, in sectional detail, for the benefit of readers interested in reproducing it.

However, although full building instructions have been prepared, we have been unable to include them in these pages. They, alone, would have filled-up nearly the whole magazine! We have therefore printed the instructions separately and will be delighted to supply a copy to any reader wishing to build the loco. Just drop a line to Meccano Magazine Quarterly, Binns Road, Liverpool L13 1DA, enclosing a stamped addressed envelope (minimum length 8½").

We regret that we can supply only one free copy to each interested reader. Additional copies will be supplied on request, but will be charged for at a rate of 12½p each, plus 2½p postage.

DUPLICATE MODEL

In actual fact, the model illustrated is a duplicate of the original prize-winning loco, built by our Model Department for display purposes. The original remained the property of its builder and was available to us for a limited time only.

The original, itself, was the handywork of 11 year-old Mark Knowles of Laverstock, Salisbury, Wilts. Despite his tender years, Mark is a very competent modeller, as witnessed by the fact that he built his model almost entirely by himself. He did receive a certain amount of assistance from his father, but this was primarily in the form of advice, rather than actual model-building aid, and was permitted within the contest rules.

JUDGING

The Globe-trotter Competition closed early last summer and the winner was subsequently selected by a distinguished panel of judges, headed by Sir Alec Issigonis, designer of the famous British Leyland Mini Car and himself a Meccano modeller of long-standing. Sir Alec's co-judges were Mr. H. J. Fallmann, Managing Director of Meccano Ltd., Mr. Michael Riddle, B.O.A.C. Passenger Manager for the Midlands, and Mr. Frank Casey, Managing Director of Brunnings Advertising and Marketing (Liverpool) Ltd., Meccano's co-advertising agents and the people who first devised the Globe-trotter contest. Judging was difficult, to say the least, but we can truthfully report that all four judges – quite independently of each other – selected Mark's model as the winner. The choice was unanimous.

Mark based his model on a real-life locomotive preserved in Walt Disney World, Florida, U.S.A. It was not of course intended as an exact reproduction, but

Continued on page 20.

Illustrated above, Globe-trotter winner Mark Knowles with his prize loco. Opposite page: top, side view of chassis; centre, underside view of chassis; bottom, bodywork removed from chassis. More photos on page 6.

LIVE-STEAM LOCO *continued from page 4.*

more a representation of the type of loco and it undoubtedly achieves its desired aim. It certainly captures the feeling and atmosphere of the subject. The crowning feature of the model, however, is the fact that it is a live-steam locomotive. It incorporates the Meccano Steam Engine and will actually run under its own power; hissing, chuffing and bubbling away like a living thing! Speed is slow – but the effect is splendid!

As can be seen from the accompanying photographs, the model carries plenty of intricate detail. Equipped with a 4-4-0 wheel arrangement. It measures almost 3 feet from cow-catcher to tender rear buffers, has an overall height of 1 foot and a maximum width of 7 inches. Drive from the Steam Engine crankshaft is geared down between the Engine sideplates and transferred to the rear main driving wheels by Sprockets and Chain. The Steam Engine spirit burner is fed to its heating position through the smokebox door at the front of the built-up loco boiler and the boiler is sufficiently large to enable the door to be closed with the burner in position. Like any model, of course, there are certain aspects of the loco which could be improved if an unlimited supply of parts were at the builder's disposal, but Mark has nonetheless produced a first-class construction, worthy of the highest praise.

TRIP TO AMERICA

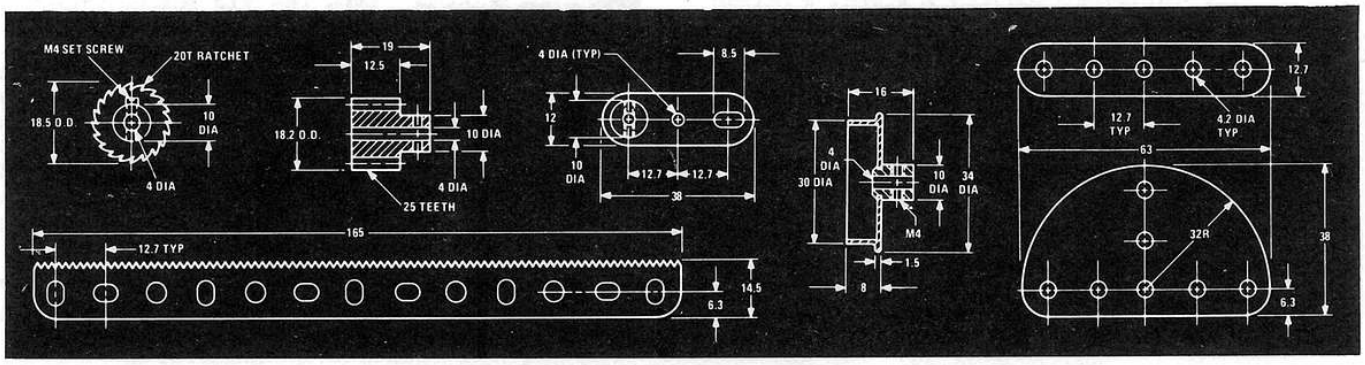
As first prize in the Globe-trotter competition, Meccano undertook to fly out the winner and a companion by B.O.A.C. Earthshrinker jet to see the real thing on which the model was based. Accordingly, on 30th November last year, Mark and his father left London Airport for an 8-day luxury holiday in Florida, U.S.A. During the trip they visited Walt Disney World and saw the original locomotive in operation at the giant pleasure park. They also witnessed the blast-off from Cape Kennedy of the Apollo 17 moonshot, had a flight in a helicopter and generally enjoyed the holiday of a life-time. No doubt Mark came back with plenty of ideas for new Meccano models!

MECCANO PARTS CHECKLIST

M.W. Publications, based at 165 Reading Road, Henley-on-Thames, Oxfordshire, have just published a 56-page manual entitled "Meccano Parts Checklist" which will undoubtedly be of considerable value to Meccano enthusiasts, especially those who possess a comprehensive selection of current, obsolete and 'odd' Meccano parts.

The manual was compiled by Mike Nicholls and its primary aim is to enable the Meccano enthusiast to record the contents of his outfit in the form of an inventory. Apart from this however, it contains a wealth of interesting, enlightening and extremely valuable detailed information. For example, it lists each and every current and obsolete Meccano part ever produced, including Plastic Meccano parts, electric parts, electronic parts, Clock Kit parts and Multikit parts. It also gives supplementary information on clockwork motors, electric motors, steam engines, tools, oilcans and even paint!

The Checklist has been produced in a 'landscape', A4 (11¾" x 8½") format, and has removable pages which are held together by a strong, plastic clip – binder. It is available direct from M.W. Publications at a cost of 75p.



Add a new dimension to MECCANO®

Our brand new Meccano catalog features the complete line of standard mechanical parts with detailed dimensions and specifications.

The catalog is a must for creators of original Meccano models and for those who are using Meccano components in other areas, such as the construction of industrial and scientific prototypes, educational models, and for building that "better mouse trap".

To get your copy of the fully-dimensioned Meccano parts catalog, send 30¢ ppd. (for airmail outside the U.S., $1.00 ppd.) to STOCK MODEL PARTS, 54 South Denton Avenue, New Hyde Park, New York 11040.

Also Available: A new, comprehensive handbook of metric small drive components. The handbook features hundreds of off-the-shelf components, such as gears, shafts, bearings, couplings, pulleys, linkages, etc., plus an extensive technical reference section for working with metrics. Send 95¢ ppd. (for airmail outside the U.S., $1.95 ppd.) to Stock Model Parts.

Exclusive U.S. distributors of customized kits and industrial products for MECCANO

STOCK MODEL PARTS
Division of DESIGNATRONICS

LIVE-STEAM LOCO

The following building instructions apply to the historic American Steam Locomotive model which won 1st Prize in the 1972 Meccano Globe-trotter Competition. The detailed illustrations, to which the numbers in the instructions refer, appear on pages 5 and 6 of the April 1973 issue of "Meccano Magazine Quarterly".

CHASSIS

The main chassis members are each provided by a 12½" Angle Girder extended by a 4½" Angle Girder, butt-joined by two 2" Strips. The members are connected together through their third and fourth holes by a 2½" Flat Girder 1; through their sixth holes by a 2½" Strip 2; through their 15th and 21st holes by two crossed 3½" Strips and through their 28th holes by another 2½" Strip. Two 2½" x 1½" Double Angle Strips 3 are bolted to the chassis members in the positions shown, the Meccano Steam Engine later being fixed to these.

Also bolted to each chassis member through its 9th and 15th holes is a 3½" Angle Girder 4 to which a Fishplate 5 is fixed by its slotted hole. A 1" Triangular Plate is also fixed to the left-hand only of these Girders, a 1" x ½" and a ½" x ½" Double Bracket 6, arranged to form a rectangle, being bolted to the apex hole of this plate.

The imitation driving cylinders are now each built up from two pairs, each of two 8-hole Wheel Discs 7, one on top of the other for strength. Attached to the inside of each pair of Discs through their top-most (12 o'clock) holes are two 1½" Corner Brackets arranged to form a 1" square compound plate. A Washer and an Electrical Brass Washer are added to the securing ⅜" Bolt, then the Bolt is screwed into the longitudinal bore of a Threaded Boss 8. A ¾" Bolt is next passed through the "3 o'clock" holes in the front pair of Wheel Discs, a Washer is added then the bolt is screwed through an electrical Insulating Spacer 9 and part-way into the longitudinal bore of another Threaded Boss. Correspondingly, another ¾" Bolt is passed through the "9 o'clock" holes in the rear pair of Wheel Discs, a Washer is added, then the Bolt is

also screwed through an Insulating Spacer and part-way into the longitudinal bore of the same Threaded Boss. The same procedure is carried out through the diagonally opposite holes in the Wheel Discs and thus the two pairs of Discs are effectively locked together with approximately $1\frac{1}{2}$" separating them.

Fixed by a Nut in the 2nd, 4th and 6th holes (counting from 12 o'clock) is a $\frac{3}{8}$" Bolt onto the shank of which an Insulating Spacer is screwed. Inserted into the 5th holes, without the Nut, is an ordinary Bolt which is screwed into the longitudinal bore of another Threaded Boss 10 in each case.

Attached between the inner top corners of the 1" plates formed by the Corner Brackets is a $1\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strip, the securing Bolts also fixing two Angle Brackets in place. Bolted to the spare lugs of these Angle Brackets is a $1\frac{1}{2}$" Flat Girder 11 while another $1\frac{1}{2}$" Flat Girder is bolted to the body of the Double Angle Strip. Using two $\frac{1}{2}$" Bolts, the whole assembly is now secured by the rear Flat Girder to the appropriate chassis member, but is spaced from it by a Collar on the shank of each Bolt. At the same time a $5\frac{1}{2}$" x $1\frac{1}{2}$" Plastic Plate 12 is secured by its fourth holes to the back of the Flat Girder. The Bolts pass through the elongated lower end holes of the Flat Girder, through the 4th holes of the Plastic Plate, are fitted with the Collars and are then fixed in the 5th and 7th holes of the chassis members, at the same time fixing a $2\frac{1}{2}$" x $1\frac{1}{2}$" Flanged Plate 13 between the chassis members. The Plastic Plate is now curved under the cylinder and is secured to it by Bolts passed through the 7th holes of the Plastic Plate and screwed into the Transverse Bores of the lower Threaded Bosses secured to Wheel Discs 7. The Plate is then curved further round the cylinder and its end fixed by Set Screws, each fitted with a Washer and an electrical Brass Washer, screwed into the Transverse Bores of Threaded Bosses 8.

Returning to the forward 1" square compound plate, a Pivot Bolt is passed through the outer top corner hole of this plate, is fitted with a Washer and is inserted into the female half of a Dog Clutch 14 which is locked onto the Pivot Bolt by one Grub Screw only. At this stage the Pivot Bolt should be loose in the plate, a distance of 3/16" lying between the bolthead and the Dog Clutch. A Threaded Boss is secured by one transverse bore to the centre of a $1\frac{1}{2}$" Angle Girder 15, the securing Bolt passing through the elongated hole of the Girder and being fitted with two Washers, one each side of the Girder flange. The Angle Girder is then secured to Flat Girder 11 by means of a Bolt screwed down through the Flat Girder and into the transverse bore of the Threaded Boss. Another Bolt is screwed through the Girder into the free threaded bore of Dog Clutch 14. When this is tightened, it will be found that the Pivot Bolt head projects clear of the 1" plate and this is intentional.

Located in the outer top corner hole of the rear 1" compound plate is an Adaptor for Screwed Rod in which a 1" Screwed Rod is locked by a Nut. The other end of this Rod is screwed into one transverse bore of a Collar 16, in the longitudinal bore of which

a Pivot Bolt is fixed, shank upwards. The Pivot Bolt carries a Nut and is screwed into one transverse bore of another Collar fixed on the end of a 5" Rod journalled in Fishplates 5. The Nut on the Pivot Bolt is locked against the Collar and note that the Rod is common to the Collars at both sides of the model. A Short Coupling is also fixed on the Rod, in contact with right-hand Fishplate 5. Attached by Angle Brackets to the rear corners of Flat Girder 1 are two 1" Triangular Plates 16A while two further Angle Brackets are bolted to the chassis members through their 8th holes. A 2½" Curved Strip is bolted between the spare lugs of these Angle Brackets.

Now bolted to the side of each chassis member, through its 13th hole - and spaced from it by three Washers on the shank of the securing ½" Bolt are a 1" x ½" and a 1" x 1" Angle Bracket, arranged to form a 1" x 1" compound double bracket 17. Tightly fixed to the upper lug of this compound double bracket are two parallel 2½" Strips, spaced apart by three Washers on the securing Bolt. Another 2½" Strip is fixed to the lower lug. Sliding on this Strip and on the lower of the top two Strips are two Slide Pieces 18 fixed on a 1" Rod and carrying between their bosses two Rod and Strip Connectors, one projecting forwards and the other pointing rearwards. Held in the forward Connector is a 3½" Rod which slides freely in the centre holes of the cylinder Wheel Discs. The rear Rod and Strip Connector is extended, via a 1" Rod, by another Rod and Strip Connector 19.

The four driving wheels are next each built up quite easily from a Gear Ring and a Spoked Wheel which are locked tightly together by three compound double brackets 20, supplied by ½" Angle Brackets, connected by their slotted-holed lugs. Carried in one tapped bore in the boss of the Spoked Wheel is a Threaded Pin, locked in place by a Nut so that it does not foul the centre bore of the boss. A Washer and a Collar 21 are carried on the shank of the Pin. The driving wheels are mounted on two 4½" Rods held by Collars in 1" Triangular Plates bolted to the chassis members in the positions shown. A ¾" Sprocket Wheel 22 is carried on the forward Rod, while another ¾" Sprocket and a 1½" Sprocket 23 is carried on the rear Rod. The two ¾" Sprockets are connected together by Chain, while the 1½" Sprocket is connected to a third ¾" Sprocket on a 3" Rod, held by Collars in the second holes from the rear ends of the chassis members. A ¾" Contrate Wheel 24 is also fixed on the Rod.

The side rods linking the driving wheels are each provided by a 6" compound narrow strip 25, built up from two 3½" Narrow Strips overlapped two holes. They are loosely held in place by Bolts screwed into the transverse bores of Collars 21 on the Threaded Pins in the bosses of the driving wheels. The front holding Bolt also secures one end of the main driving rod - again supplied by a 3½" Narrow Strip - the forward end of which is lock-nutted to Rod and Strip Connector 19.

At this stage the cow-catcher may conveniently be assembled. Attached by a 1⅛" Bolt and Nuts to each end of a 3½" Angle Girder 26 is a 1" x ½" Angle Bracket (fixed by its long lug to the top of the

Girder flange) and a Double Bracket, fixed to the underside of the flange. Carried in the lugs of the Double Brackets are two 2" Screwed Rods connected together by a central Threaded Boss 27. Working outwards from this central Boss are, in order, two Washers, a Nut, a Rod and Strip Connector, five Washers, another Rod and Strip Connector, five more Washers, a third Rod and Strip Connector, then four Washers. Next comes the inner lug of the Double Bracket, followed by two electrical Thin Washers and an ordinary Washer, another Rod and Strip Connector, eighteen Thin Washers and an ordinary Washer and then the outer lug of the Double Bracket. A Threaded Boss 28 is screwed onto the outer end of the Rod by its longitudinal bore. Locked by a Nut in the lower Transverse Bore of this Boss is another 2" Screwed Rod, on the lower end of which a 3½" Narrow Strip 29 is fixed by two further Nuts. The inner ends of the Narrow Strips at each side are brought together to form a point and are bolted together, at the same time fixing an Obtuse Angle Bracket in position. A second Obtuse Angle Bracket is bolted to the centre of the Vertical Flange of Angle Girder 26, then the spare lugs of the two Angle Brackets are connected by two 2½" Narrow Strips 30, one each side of the lugs and further spaced by two Washers on each Securing Bolt. Rods of appropriate lengths (2½" and 2") are fixed in the Rod and Strip Connectors to complete the familiar cow-catcher lattice-work.

Bolted to the centre top Flange of Angle Girder 26 are two Fishplates, one on top of the other, representing the front coupling point of the locomotive. Two 1½" Strips are then bolted through the second holes of each end of the Angle Girder, these Strips being connected by a 2½" Flat Girder 31, the securing ⅜" Bolts also fixing the complete assembly to the chassis members. Note, however, that the Flat Girder is spaced from the chassis members by three Washers on the shank of each securing Bolt.

STEAM ENGINE

Mounting points for the Meccano Steam Engine are supplied by the two 2½" x 1½" Double Angle Strips 3 which are bolted to the main chassis members through their first and 17th holes counting from the rear of the chassis. The Steam Engine, boiler forward, is bolted to the backs of the Double Angle Strips, the front securing bolts also fixing two Angle Brackets 32 in position. Note that each securing ⅜" Bolt also carries a Washer between the Angle Bracket and the engine baseplate and another Washer between the engine baseplate and the Double Angle Strip. The rear Double Angle Strip mounting is bolted direct to the Steam Engine baseplate through its second row of holes.

Fixed to the underside of the baseplate through its third row of holes is a Double Bent Strip. Journalled in this and in the baseplate is a 1½" Rod on the lower end of which a ½" Pinion is fixed, with a 1½" Contrate Wheel being fixed on the upper end of the Rod. The Pinion meshes with ¾" Contrate 24, while the 1½" Contrate meshes with a 7/16" Pinion on a 3" Rod journalled in the engine sideplates. A 1" Gear is also fixed on this Rod, this meshing with a second 7/16" Pinion fixed on the engine crankshaft.

Now bolted underneath the rear end of the engine baseplate is a Trunnion 33, the securing Bolts also fixing a $1\frac{1}{2}$" Insulating Flat Girder to the top of the baseplate. A 1" x 1" Angle Bracket is bolted to the vertical Flange of the Trunnion to provide the loco's rear coupling point, while bolted to the Insulating Flat Girder is a $4\frac{1}{2}$" compound insulating flat girder 34, built up from two $1\frac{1}{2}$" Insulating Flat Girders and a $2\frac{1}{2}$" Insulating Flat Girder, all edged by a $4\frac{1}{2}$" Strip 35. Each end of the compound girder is edged by three Fishplates, one on top of the other to provide packing between the $4\frac{1}{2}$" Strip and the compound girder.

A cover to fit over the reduction gearing between the Engine sideplates is built up from two Girder Brackets 36, connected together by their 1" flanges. Bolted to the $\frac{1}{2}$" flange of the rear Bracket are two Fishplates, connected by a latest-style 2" Strip with the additional hole in the centre. Fixed to the Strip through this central hole is an Angle Bracket, to the spare lug of which a $2\frac{1}{2}$" Insulating Strip is bolted. Further Angle Brackets are bolted to the ends of the Insulating Strip.

Bolted to the $\frac{1}{2}$" flange of the front Girder Bracket through its second hole from the right-hand end is a 1" Triangular Plate attached by its apex hole. Fixed to this Plate through its inner base hole is an Angle Bracket, to the spare lug of which a lateral $2\frac{1}{2}$" Insulating Strip and a forward-running $2\frac{1}{2}$" Strip are bolted. Two $2\frac{1}{2}$" Insulating Flat Girders 37 are bolted across the $2\frac{1}{2}$" Strip, the frontmost Girder being secured by a $\frac{3}{4}$" Bolt carrying two Washers between the head of the Bolt and the Girder. The completed cover fits over the initial drive mechanism between the Engine sideplates with the shank of the $\frac{3}{4}$" Bolt resting on the baseplate. The two Angle Brackets at the rear corners of the cover will later be fixed through the rear row second hole up in the engine sideplates by the appropriate body-fixing Bolts, but at this stage the cover is not anchored in position. Additional anchoring points for the body are provided at each side of the boiler housing by a 2" Slotted Strip 38 attached to the upper lug of a Double Bracket (but spaced from it by three Washers) fixed by its other lug to the Engine baseplate through its 8th hole from the front.

To complete the chassis a $1\frac{1}{2}$" Rod is held by Collars in the centre hole of Strip 2 and the corresponding centre hole of Flanged Plate 13. Note that the Collars are positioned between the Strip and Plate. A Compression Spring is added to the Rod, which provides a modicum of suspension for the front bogey which locates on the Rod. The bogey itself, is built up from two pairs of two $2\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strips connected together by a $2\frac{1}{2}$" Flat Girder, the inner securing Bolts in each case also fixing two Flat Trunnions 39 in position, one above the Flat Girder and the other below the Double Angle Strip. The Flat Trunnions in each arrangement are connected by four $2\frac{1}{2}$" Strips 40, suitably positioned on, between, and under the Flat Trunnions. Bolted to the lugs of each pair of Double Angle Strips are two 1" Triangular Plates, the inner securing Bolt in each case also holding an Obtuse Angle Bracket in position. These Angle Brackets are extended by further Obtuse Angle Brackets in a "zig-zag", the spare lugs of which are connected by a $2\frac{1}{2}$" Narrow Strip 41 at each side. Journalled in the apex holes of the Triangular Plates are

two $3\frac{1}{2}$" Rods fitted with $1\frac{1}{8}$" Flanged Wheels, each of which is spaced from its Triangular Plate by two Washers. The $1\frac{1}{2}$" Rod in the chassis locates in the centre holes of Strips 40.

CAB

Moving on to the bodywork, it is advisable to build the cab and the boiler casing separately. In the case of the cab, each front corner upright is supplied by a 5" compound angle girder, consisting of a $3\frac{1}{2}$" Angle Girder and a $1\frac{1}{2}$" Angle Girder butt-joined together by one edge of a $5\frac{1}{2}$" x $2\frac{1}{2}$" Flexible Plate 42, overlaid by a $4\frac{1}{2}$" Strip and a $4\frac{1}{2}$" Narrow Strip, one on top of the other. The lower securing Bolt also fixes a $5\frac{1}{2}$" Angle Girder 43 at right-angles to the upright, the lower edge of Plate 42 also being bolted to this, while the Bolt through the 5th hole of the upright also holds a horizontal $5\frac{1}{2}$" Strip in place. This Strip is further bolted to the upper edge of Plate 42, the securing Bolts in this case also fixing two vertical window pillars 44 in place. The foremost of these consists of a 3" Strip, bolted to the inside of the $5\frac{1}{2}$" Strip, and a $2\frac{1}{2}$" Narrow Strip, bolted to the front of Plate 42, with a $2\frac{1}{2}$" Strip packed between them. The rear pillar consists of a $4\frac{1}{2}$" Strip, bolted to the inside of the $5\frac{1}{2}$" Strip, and a $2\frac{1}{2}$" Narrow Strip bolted to the front of the Plate, with a $2\frac{1}{2}$" Strip again being sandwiched between them. The lower end of the $4\frac{1}{2}$" Strip is also bolted to Angle Girder 43.

Fixed at right-angles to the top of the upright compound angle girder is another $5\frac{1}{2}$" Angle Girder, overlaid along its side flange by a $5\frac{1}{2}$" Narrow Strip 45. The upper ends of the window pillars are bolted to this Girder, as also are two Obtuse Angle Brackets, to the spare lugs of which a $4\frac{1}{2}$" Narrow Strip is secured to represent "eaves" over the side windows.

The rear edge of Plate 42 is overlaid on the inside by a $2\frac{1}{2}$" Strip and on the outside by a $2\frac{1}{2}$" Strip, itself overlaid by a $2\frac{1}{2}$" Narrow Strip. Two Handrail Supports carrying a $1\frac{1}{2}$" Rod 46 are fixed in the Strips to represent the cab-access handrail, while a $3\frac{1}{2}$" Strip overlaid by a $2\frac{1}{2}$" Narrow Strip is bolted horizontally to the centre of Plate 42 to represent the locomotive nameplate.

At the front of the cab, the upper ends of the corner uprights at each side are connected by a $5\frac{1}{2}$" Strip 47, the securing Bolt at each end also fixing in place a 3" Narrow Strip overlaying the flange of the relevant upright. The Bolt fixing the lower end of the Narrow Strip to the upright also helps to secure a vertical $2\frac{1}{2}$" x $1\frac{1}{2}$" Flexible Plate 48, the upper edge of which is overlaid by a $1\frac{1}{2}$" Strip. Sandwiched between this Strip and the Plate is a 3" Narrow Strip 49, the upper end of which is sandwiched between $5\frac{1}{2}$" Strip 47 and a $4\frac{1}{2}$" Strip 50 bolted to the inside of Strip 47. Also sandwiched between these two Strips is a $4\frac{1}{2}$" Stepped Curved Strip 51. Note that the 3" Narrow Strip is angled slightly to represent the angled window pillar of the original.

Bolted to the inside of Flexible Plate 48 through its second inner-edge hole is a $2\frac{1}{2}$" Stepped Curved Strip 52, which is connected to its corresponding Curved Strip at the opposite side by a 1" Corner Bracket. A $1\frac{1}{2}$" x $1\frac{1}{2}$" Flat Plate 53 is bolted between the apex of this Corner Bracket and the centre of Strip 47. Fixed to left-hand Curved Strip 52 inside the cab, is a Single Bent Strip, the securing Bolt also fixing an Angle Bracket to the outside of the Curved Strip. A "gauge" is fixed to the free lug of this Bent Strip, this being represented by a $\frac{3}{4}$" Washer 54 over the face of a $\frac{3}{4}$" Flanged Wheel, both fixed to the Single Bent Strip by a $\frac{3}{4}$" Bolt. Fixed to right-hand Curved Strip 52 inside the cab, is a $\frac{1}{2}$" Reversed Angle Bracket, the securing Bolt again also fixing an Angle Bracket to the outside of the Curved Strip. Attached to the spare lug of the Reversed Angle Bracket is a handwheel (not a steering wheel!), built up from a 1" Rubber Ring located on the heads of four Bolts screwed into the transverse bores of a 4-holed Collar 55 (electrical part No.500). The Collar is carried on a Contact Stud locked by Nuts in the Bracket lug.

At the left-hand side of the cab, a $1\frac{1}{2}$" Angle Girder is bolted to Angle Girder 43 through its second hole from the rear end. The vertical flange is extended by a $1\frac{1}{2}$" Flat Girder 56, to the upper edge of which another $1\frac{1}{2}$" Angle Girder is secured. Bolted, in turn, to the top flange of this Girder is a $3\frac{1}{2}$" x $1\frac{1}{2}$" compound flat girder, built up from two overlapping $3\frac{1}{2}$" Flat Girders, the forward end of which is attached to the cab sides by a 1" x 1" Angle Bracket. Note that this Bracket is spaced from the compound flat girder by two Washers on the shanks of the remaining Bolts. Bolted to the compound girder, beside this Bracket, is a $\frac{1}{2}$" Reversed Angle Bracket, in the free lug of which another handwheel is mounted. Supplied by an electrical 1" Bush Wheel 57, fitted with a Threaded Pin, this handwheel is mounted on a 1" Rod held by a Collar in the lug of the Reversed Angle Bracket. The Bush Wheel is spaced from the lug by two Washers.

Bolted to the rear end of each Angle Girder 43 is an outward-pointing Fishplate and two inward-pointing $1\frac{1}{2}$" Strips, one on top of the other. Two Angle Brackets are fixed to the underside of the Strips, the end securing Bolt also holding a Corner Angle Bracket in place. Bolted to the spare lug of the Fishplate, outside the cab, is a $5\frac{1}{2}$" Narrow Strip 58, the forward end of which is bolted to another Fishplate secured to the forward end of Angle Girder 43. Fixed to the right-hand Angle Girder, inside the cab, are two $1\frac{1}{2}$" Insulating Flat Girders 59, while a $1\frac{1}{2}$" Insulating Strip, angled rearwards slightly is fixed to the left-hand Girder through its second hole from the forward end. When the body is mounted on the chassis, these Insulating components are attached to the Steam Engine mechanism cover which, of course, also serves as the cab floor, or "footplate".

The cab roof is simply built up from four curved $4\frac{1}{2}$" x $2\frac{1}{2}$" Flexible Plates, completely overlaid by four $4\frac{1}{2}$" x $2\frac{1}{2}$" Plastic Plates 60, attached by Obtuse Angle Brackets to two 7" compound flat girders 61 fixed to the Angle Girders carrying Strips 45. Each compound girder consists of one 3" and two 2" Flat Girders, butt-joined by a $5\frac{1}{2}$" Flat Girder.

Attached by an Angle Bracket to the underside of the top flange of each Girder carrying Strips 45 through its 5th hole from the front, are two Fishplates. Clamped between these Fishplates at each side of the cab is a 4" Stepped Curved Strip 62. Attached by an Angle Bracket to each Angle Girder through its third hole from the rear end are two more Fishplates, but these do not support a Curved Strip.

BOILER HOUSING

Coming next to the boiler housing, it is best to begin construction with the front, or smokebox end. A 6½" long cylinder, with a 10" (20 holes) diameter, is produced from six 5½" x 2½" Flexible Plates, curved to shape and suitably overlapped. Note that the front pair of Plates is completely overlaid by two 5½" x 2½" Plastic Plates 63, and that the joint with the second pair of Flexible Plates is overlapped by a band supplied by six electrical 2" Flexible Strips 64 connected together to form a 9½" compound flexible strip. The lowest hole in the cylinder is left clear to receive the Bolt which secures inside the cylinder an Angle Bracket and the forward end of a 5½" Strip which runs back down the cylinder to act as a bracing strip for the Flexible Plates. The rear end of the Strip is extended two holes by a 2" Strip 65.

Fixed to the top of the cylinder, inside, is a 5½" Narrow Strip, the forward securing Bolt passing through the second hole of the Strip and into the hole in the cylinder diametrically opposite the hole through which the lower Angle Bracket is fixed. This Bolt also secures an Angle Bracket in place, inside the cylinder, as well as fixing a Threaded Crank by its arm to the top outside of the cylinder at the Flexible Strip bands. Also secured inside the cylinder, running back from the Flexible Strip band position, are two 3½" Strips, bolted one to each side of the cylinder where the Flexible Plates join. Bolted round the inside front edge of the cylinder are four Formed Slotted Strips, overlapped as necessary, but with the lowest pair of overlapping holes being left clear. The upper pair of Formed Strips are connected together at their highest point by a ⅜" Bolt which also carries above the cylinder a 1½" Corner Bracket 66, four Washers, a 1½" Strip, two Fishplates, one on top of the other, and a final Washer.

Tightly fixed by Nuts in the spare lugs of the two Angle Brackets inside the cylinder are two forward-pointing 3" Screwed Rods. A circular ring 67 is built up from four 2½" Stepped Curved Strips, then this, in turn, is fixed by Nuts on the forward ends of the Screwed Rods. Attached to the ring by a Hinge is the smokebox door, supplied by a Face Plate to which a Wheel Flange 68 and a ¾" Flanged Wheel are secured, the latter by a ⅜" Bolt held in the boss of the Face Plate.

Turning to the outside of the cylinder, attached to the underside in the positions shown are two similar assemblies, each built up from two 1" x 1" Angle Brackets and a Channel Bearing 69. Fixed to the sides of the cylinder, four holes from the front, are two Collars 70, while fixed lower down the side, nine holes from the front,

are two Obtuse Angle Brackets which are each straightened slightly and extended by another Obtuse Angle Bracket, also straightened. This Bracket will later provide an anchoring point for the side catwalk.

Secured to the top of the cylinder is the bell (non-ringing in our case) and what, I believe, is a steamchest.

The bell is built up from a Chimney Adaptor 71 locked, with a Collar, on the shank of a ¾" Bolt. Two ½" Bolts, each carrying an electrical Thin Washer and a Rod and Strip Connector, are screwed into the transverse bores of the Collar. The Rod and Strip Connectors locate on the shanks of two ¾" Bolts locked by Nuts in the end holes of a 1½" Strip, to the centre of which a Fishplate is bolted. The assembly is attached to the cylinder by the free lug of this Fishplate, two Washers on the securing Bolt shank acting as spacers.

The steam chest consists of a Double Arm Crank bolted to the top of the cylinder through the centre hole of the appropriate Flexible Plate. Fixed in the boss of the Crank is a 1" Screwed Rod on which are fitted, in order, three Washers, a 1" Pulley with Rubber Ring, boss downwards, six Washers and a Collar, the latter screwed tightly on to the Rod by its transverse bore to serve as a locking nut. A 5½" x 1½" Flexible Plate completely overlaid by a 5½" x 1½" Plastic Plate 72, is formed into a small cylinder gripping the 1" Pulley with Rubber Ring and the overlap is overlaid by a 1½" Strip. A Handrail Support is fixed to the upper right-hand side of the cylinder thus formed, then a top is provided by a 1½" Contrate Wheel 73 fixed by a ½" Bolt screwed into the transverse bore of the "locking" Collar.

The smokestack (chimney) and headlamp are still to be fitted, but these should be left until later. Before leaving the section, however, two 4" Rods 74 are secured, one to each side of the main cylinder by Handrail Supports, positioned as shown.

Now bolted to the spare lugs of the Angle Brackets attached to Stepped Curved Strips 50 in the cab are three Formed Slotted Strips 75, the securing Bolts also fixing two forward-running 3½" Strips in place. Two further 3½" Strips are bolted, one to the lower end of each outer Formed Strip, while two 3½" Narrow Strips are bolted to the centre of each outer Formed Strip. Secured to all these straight Strips, as shown, are two shaped 3½" x 2½" Flexible Plates 76 connected at the top by a 5½" x 1½" Flexible Plate, the latter positioned closest to the cab so as to leave a gap at the top forward section of the assembly. This gap is essential as the filler cap/safety valve of the Meccano Steam Engine protrudes through it when the body is mounted on the chassis. An electrical Core Holder for Rectangular Coil 77 is bolted to the centre of the 5½" x 1½" Plate, the lip resting on the centre Formed Slotted Strip.

Bolted to the forward ends of the 3½" Strips and Narrow Strips are another three Formed Slotted Strips 78, the lower end securing Bolt at each side also fixing in position an Angle Bracket, a 2½" Strip, a curved 3½" x 2½" Flexible Plate 79 and another Angle

Bracket 80. The first Angle Bracket and the $2\frac{1}{2}$" Strip are situated inside the boiler, while the second Angle Bracket is on the outside and will later provide a chassis anchoring point. Bolted to the first Bracket at each side are two downward-pointing $1\frac{1}{2}$" Strips 81, one on top of the other, which will also serve as a chassis anchoring point. The Flexible Plates at each side are connected at the top by a $2\frac{1}{2}$" x $1\frac{1}{2}$" Flexible Plate and full use must be made of the slotted holes in all these Plates to produce a slight funnel shape, the forward section of the boiler being of smaller diameter than the rear section. The $2\frac{1}{2}$" Strips inside the boiler are angled upwards slightly and are also slightly bent inwards so that their forward ends are approximately $\frac{3}{8}$" from the nearby Plate. Journalled in the end holes of the Strips are two Adaptors for Screwed Rod 82 connected by a 2" Screwed Rod. The tips of the Adaptors make contact with the Flexible Plates and the assembly thus acts as an adjustable brace for this section of the boiler.

Four Handrail Supports are next fixed, two to each Formed Slotted Strip arrangement 75 and 78 in the positions show, then the two boiler sections can be mated together. The forward cylinder locates just over the funnel-shaped section, to which it is fixed by two Bolts which pass through the forward lower corner holes of Flexible Plates 76. The top $5\frac{1}{2}$" Narrow Strip inside the cylinder locates under the $2\frac{1}{2}$" x $1\frac{1}{2}$" Flexible Plate in the funnel-shaped section and is bent upwards to follow the slope of the funnel. Rod 74 at each side is then extended rearwards, via a Rod Connector, by a Flexible Coupling Unit which is curved upwards and attached by another Rod Connector to another Flexible Coupling Unit fixed in the Handrail Support in the forward Formed Slotted Strip band 78. This unit is itself connected by a third Rod Connector to a 2" Rod held in the Handrail Support secured to Formed Slotted Strip band 75.

Each side catwalk is now built up from a $3\frac{1}{2}$" Flat Girder and a $4\frac{1}{2}$" Flat Girder 83, butt-joined by a $7\frac{1}{2}$" Flat Girder, the rear joining Bolts also fixing a second $3\frac{1}{2}$" Flat Girder 84 in place to extend the first $3\frac{1}{2}$" Girder $\frac{1}{2}$" outwards and rearwards. The forward angle between the two $3\frac{1}{2}$" Girders is rounded-off with a 1" Corner Bracket, while the rear angle is enclosed by a $1\frac{1}{2}$" Strip 85 bolted to the rear end of Flat Girder 84. The forward end of Girder 83 is also rounded-off with a 1" Corner Bracket, then the finished catwalk is bolted to the Obtuse Angle Bracket connected to the underside of the boiler.

Attached to the underside of the catwalk through its inner tenth hole from the rear is a Corner Angle Bracket, spaced from the catwalk by a Washer, Fishplate and two more Washers on the shank of the securing $\frac{3}{8}$" Bolt. The free lug of this Corner Angle Bracket is connected to the free lug of the Corner Angle Bracket at the rear underside of the cab by a $9\frac{1}{2}$" Strip. Bolted to this Strip in the order shown are a $2\frac{1}{2}$" x $1\frac{1}{2}$" Triangular Flexible Plate, two $3\frac{1}{2}$" x $1\frac{1}{2}$" and another $2\frac{1}{2}$" x $1\frac{1}{2}$" Triangular Flexible Plate. The wheel arches thus supplied are edged by two 5" Stepped Curved Strips connected by two overlapping 2" Slotted Strips 86.

The chimney can now be built up. Fixed in the boss of the Threaded Crank at the smokebox end of the boiler is a $3\frac{1}{2}$" Screwed Rod on which a $1\frac{1}{2}$" Pulley fitted with a Motor Tyre is locked by Nuts approximately half way up the Rod. Held by Nuts on the upper end of the Rod is a Threaded Coupling, the Rod passing through the centre tapped bore of the Coupling. Located over the Rod and Coupling, its lower end resting on the face of the $1\frac{1}{2}$" Pulley, is a $2\frac{1}{2}$" Cylinder 87 held in place by a $\frac{1}{2}$" and a $\frac{3}{4}$" Bolt screwed into the longitudinal bores of the Coupling. A 1" Rubber Ring and a $1\frac{1}{2}$" Motor Tyre 88 are wedged onto the Cylinder near its upper end. Clamped round this Tyre and that on the $1\frac{1}{2}$" Pulley is the outside cladding which reproduces the distinctive shape of the typical western-style loco smokestack. This is built in two sections from $2\frac{1}{2}$" x $1\frac{1}{2}$" Flexible Plates. (On our duplicate model illustrated, these were specially painted blue to blend with the blue tip to the boiler.) In the upper section, four Plates 89 are bolted horizontally, with full use being made of the slotted holes to result in the chimney tapering towards the top. In the lower section, seven vertical Plates are used, each edged by a $2\frac{1}{2}$" Narrow Strip 90 and each overlapping the next by two holes <u>at the lower edge only</u>. This overlap results in the sections tapering towards the base of the chimney where it locates in a 1" Motor Tyre. In the centre of the chimney, the two sections are clamped inside a ring 91 made up of four Formed Slotted Strips.

Turning to the headlamp, the base consists of two $2\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strips, the rear one bolted to Corner Bracket 66. Bolted to the lugs of the Angle Strips at each side is a $1\frac{1}{2}$" Flat Girder 92, the rear securing Bolt also fixing a Pawl without boss in position to provide a bit of added ornamentation. Bolted to the centre of the Angle Strips is a 1" x 1" Angle Bracket, to the vertical lug of which a $1\frac{1}{2}$" x $1\frac{1}{2}$" Flat Plate is fixed to serve as the back of the lamp. Secured to the centre inside of the Plate is an electrical 1" Core for Cylindrical Coil, to the other end of which a second $1\frac{1}{2}$" x $1\frac{1}{2}$" Flat Plate is bolted to provide the front of the lamp, the securing Bolt also holding in position a $\frac{3}{4}$" Washer 93 and two 1" Pulleys without boss, the foremost of which is fitted with a 1" Rubber Ring. The lamp top is enclosed by four Angle Brackets, bolted two to each Flat Girder. Mounted on top of the spare lugs of these Brackets are a $\frac{7}{8}$" Bevel Gear 94 and two more 1" Pulleys without boss, all located on a $1\frac{1}{8}$" Bolted and clamped tightly in position by a $\frac{3}{4}$" Washer and Nut beneath the Angle Bracket lugs.

To enclose the gap in the boiler, through which the Meccano Steam Engine filler protrudes, a removable steam chest is simply produced from a $5\frac{1}{2}$" x $1\frac{1}{2}$" Flexible Plate 95 bolted round two 1" Motor Tyres wedged on a Ship's Funnel. The upper edge of the Plate is overlaid by four overlapping electrical Flexible Strips, while the join between the ends of the Plate is overlaid by a vertical $1\frac{1}{2}$" Strip. The completed unit is positioned on the loco by wedging the lugs of the Ship's Funnel, one beneath the nearby Formed Slotted Strip 78 and the other beneath electrical Core Holder 77. A top for the unit is provided by an electrical 1" Bush Wheel in the boss of which a $1\frac{1}{8}$" Bolt is held by a Nut. Two ordinary Bolts, shanks upwards, are held

in two of the face holes, while an imitation whistle or safety valve is represented by a $\frac{3}{4}$" Bolt, held by Nuts in another face hole. Clamped by electrical Thin Washers between Nuts on the upper end of the shank of this Bolt is a short length of thin wire fitted with Spring Cord to represent piping. This disappears inside the cab, where the end is fitted with a Hook for Spring Cord, presumably acting as a whistle handle. As the Bush Wheel must be removed while the Meccano Steam Engine is filled, it is simply wedged in the top of the Ship's Funnel.

At long last the body may now be mated to the chassis. Angle Brackets 80 are bolted through the catwalk to Slotted Strips 38; Strips 81 inside the boiler body are bolted to Angle Brackets 32 on the front of the Meccano Steam Engine; Strip 65 is bolted to the Steam Engine baseplate; the appropriate Angle Brackets at the rear of the cab are bolted through the rear row, second from bottom holes in the Steam Engine sideplates and, finally, Collars 70 are connected to Threaded Bosses 28 by 3" Screwed Rods.

Before leaving the loco, a step allowing access to the cab is provided at each side of the model by a 2" Strip 96, to which two Angle Brackets are bolted. The upper end of the Strip is fixed to the lower rear corner of the Steam Engine sideplates. Also, the front of the boiler support between the body and chassis is completed by two $2\frac{1}{2}$" x $1\frac{1}{2}$" Triangular Flexible Plates 97, bolted apex to apex and overlapped two holes. Two $1\frac{1}{2}$" Angle Girders are secured to the angled upper edges of the Plates, then the assembly is attached to the forward edges of the wheelarch Triangular Flexible Plates by Angle Brackets.

Inside the cab, a cover for the Steam Engine flywheel is built up from a $2\frac{1}{2}$" Angle Girder and a $2\frac{1}{2}$" Strip connected together at the ends by $1\frac{1}{2}$" Angle Girders 98, at the same time fixing a $2\frac{1}{2}$" x $1\frac{1}{2}$" Plastic Plate 99 in position. Bolted to the vertical flange of the forward $1\frac{1}{2}$" Girder are two Flat Trunnions, secured apex to apex and overlapping two holes. Bolted to the rear $1\frac{1}{2}$" Girder are three 2" Strips, connected together at the lower ends by a $1\frac{1}{2}$" Strip. Bolted to the $2\frac{1}{2}$" Strip are two Angle Brackets, while, bolted to the vertical flange of the $2\frac{1}{2}$" Angle Girder is a $2\frac{1}{2}$" Flat Girder 100 extended downwards at the forward end by a 2" Flat Girder. The completed cover fits over the flywheel and is attached to the side of the cab by the Angle Brackets.

The loco is nicely finished off with a bell-rope supplied by a length of Cord running from the cab, through the Handrail Support on the forward steam chest and tied to the Bolt protruding from the top of the "bell". Also, a length of "pipe" - thin wire covered with Spring Cord - runs from each side of the forward steam chest, down the boiler and through the catwalk, to disappear inside the boiler support.

TENDER

This, then, completes the locomotive. Next, we have the tender. Each side consists of a $9\frac{1}{2}$" x $2\frac{1}{2}$" Strip Plate 101, extended

one hole upwards and downwards by a $9\frac{1}{2}$" Flat Girder and edged at the front by a $3\frac{1}{2}$" Angle Girder 102 and at the rear by a $2\frac{1}{2}$" Angle Girder overlaid by a $2\frac{1}{2}$" Strip 103. The appropriate lower securing Bolts also fix two horizontal $5\frac{1}{2}$" x $2\frac{1}{2}$" Flanged Plates 104, flanges upwards, between the sides, one at each end, while the upper rear Bolts also fix two Angle Brackets in place. A $5\frac{1}{2}$" x $3\frac{1}{2}$" Flat Plate 105 is bolted to these Angle Brackets, a Wheel Flange overlaid by a $\frac{3}{4}$" Washer being bolted in turn to the Plate.

At the front of the tender, two $5\frac{1}{2}$" Flat Girders 106 are secured between Angle Girders 102 and a Handrail 107 is also fixed to each Girder 102. This consists quite simply of a 2" Rod held in two Handrail Supports. Secured to the centre of the lower Flat Girder is a 1" x $\frac{1}{2}$" Angle Bracket 108 underlaid by a Fishplate, which serves as the loco coupling point.

Bolted between the $2\frac{1}{2}$" Angle Girders at the rear of the tender is a $5\frac{1}{2}$" x $2\frac{1}{2}$" Flexible Plate 109 edged by $2\frac{1}{2}$" Strips and extended one hole upwards and downwards by $5\frac{1}{2}$" Flat Girders. Fixed to the lower Flat Girder are two buffers 110, each supplied by a $\frac{3}{4}$" Washer and a 1" Pulley without boss fixed by a $1\frac{1}{8}$" Bolt to an electrical Insulating Spacer which is, in turn, fixed to the Flat Girder. Also secured to the Flat Girder, in the central position, are two Angle Brackets between the spare lugs of which a Collar is held on a Pivot Bolt. Locked by a Nut in the transverse bore of this Collar is a 1" Screwed Rod, on the shank of which a second Collar 111 is screwed by its transverse bore. This whole unit represents the rear coupling.

Now bolted as shown to the underside of each Flanged Plate are two $2\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strips, to the lugs of which two similar Double Angle Strips 112 are bolted to result in two box arrangements. A $1\frac{1}{2}$" Strip overlaid by a Double Bent Strip 113 is fixed between each pair of boxes, then the boxes on each Plate are connected by two $4\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strips 114, attached by Corner Angle Brackets. A $3\frac{1}{2}$" Angle Girder is also bolted between the two rear boxes, while a $5\frac{1}{2}$" Angle Girder 115 is bolted to the inner flange of the front Flanged Plate. Attached by Obtuse Angle Brackets to the spare flange of this latter Girder is a $5\frac{1}{2}$" x $3\frac{1}{2}$" Flat Plate 116 which is also attached by Obtuse Angle Brackets to the forward edge of Flat Plate 105.

A handwheel 117 is next provided by a Dinky Toy Tyre No.021 located on a 4-holed Collar, fixed by four 7/32" Grub Screws on a $\frac{1}{2}$" Bolt held by Nuts in the upper lug of a 1" x $\frac{1}{2}$" Double Bracket bolted inside the left-hand side of the tender one hole from the top and one hole from the front. Journalled in the lower lug of the Bracket and in the corresponding hole in the Flanged Plate is a 3" Rod 118, held in place by a Collar. A lip round the tender sides and back is supplied by two $9\frac{1}{2}$" Strips and one $5\frac{1}{2}$" Strip 119, attached to the respective Flat Girders by Obtuse Angle Brackets.

Each tender bogie is similarly built up from two $2\frac{1}{2}$" Angle Girders joined at each end by a $2\frac{1}{2}$" x 1" Double Angle Strip 120 and in the centre by a $4\frac{1}{2}$" Strip 121. Secured to the centre of this Strip by a Long Threaded Pin 122 is a $2\frac{1}{2}$" Strip which is also bolted to the centres of the Double Angle Strips. Two 4" Rods are journalled in the lugs of the Double Angle Strips, being held in place by $1\frac{1}{8}$" Flanged Wheels, 123, each spaced from its lug by a Washer. A Collar is secured on each end of each Rod.

Bolted to each end of Strip 121 is a 1" x 1" Angle Bracket, to the spare lug of which a $2\frac{1}{2}$" Strip overlaid by a 1" Corner Bracket, apex downwards, is fixed. Two Angle Brackets are bolted to the remaining corners of the Corner Bracket, a Pivot Bolt 124 fitted with a Compression Spring, being locked in the spare lug of each of these. Bolted finally to each end of the $2\frac{1}{2}$" Strip are two Insulating Fishplates sandwiched between three standard Fishplates 125.

It will, of course, be realised that the suspension units just described are non-operational. They are included purely for appearance.

The completed bogies are mounted in the tender with the Long Threaded Pins locating in the Double Bent Strips beneath the tender.

At this stage the model is finished. When operating it, however, it will be found that the Meccano Steam Engine firebox is situated too far inside the loco boiler for the burner to reach in its normal form. The burner handle, therefore, is extended by two $5\frac{1}{2}$" Strips 126, clamped over the handle and themselves extended by a $3\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strip. The track, incidentally, is built up from long Angle Girders connected by $7\frac{1}{2}$" Strips and $7\frac{1}{2}$" Angle Girders, suitably interspaced.

- end -

PARTS REQUIRED

6	-	1a	2	-	26c	2	-	89b	1	-	164
7	-	2	2	-	28	6	-	90a	4	-	173a
8	-	2a	1	-	29	1	-	94	4	-	175
10	-	3	1	-	30	1	-	95a	4	-	180
2	-	4	1	-	31	3	-	96a	12	-	188
29	-	5	1	-	35	6	-	103	3	-	189
11	-	6	720	-	37a	4	-	103a	4	-	190a
17	-	6a	560	-	37b	6	-	103d	4	-	191
2	-	8	246	-	38	2	-	103e	6	-	192
5	-	9	6	-	38d	3	-	103f	1	-	194
2	-	9a	1	-	40	5	-	103g	4	-	194c
8	-	9b	3	-	45	7	-	103h	3	-	194d
4	-	9d	4	-	46	2	-	103k	2	-	194e
2	-	9e	2	-	47	1	-	109	2	-	196
10	-	9f	4	-	48	5	-	111	12	-	212
53	-	10	12	-	48a	19	-	111a	6	-	213
5	-	11	1	-	48b	34	-	111c	14	-	215
3	-	11a	2	-	48c	5	-	111d	1	-	216
66	-	12	4	-	50	1	-	114	6	-	221
12	-	12a	1	-	51	5	-	115	4	-	224
5	-	12b	2	-	52	2	-	115a	15	-	235
41	-	12c	2	-	52a	8	-	120b	4	-	235a
1	-	15	6	-	55a	2	-	125	8	-	235b
2	-	15a	1	-	58	1	-	126	2	-	235d
6	-	15b	1	-	58b	4	-	126a	5	-	235f
4	-	16	36	-	59	1	-	133	1	-	500
5	-	16a	1	-	62a	12	-	133a	2	-	502
1	-	16b	1	-	63c	17	-	136	1	-	503
10	-	17	1	-	63d	2	-	137	3	-	507
2	-	18a	13	-	64	1	-	138	5	-	508
1	-	18b	4	-	69	2	-	142c	16	-	513
4	-	19a	4	-	69b	2	-	142d	2	-	518
12	-	20	3	-	74	2	-	144	1	-	525
2	-	20b	13	-	77	9	-	147b	1	-	528
1	-	21	1	-	80a	4	-	154a	9	-	530
1	-	22	1	-	80c	4	-	154b	1	-	543
6	-	22a	3	-	81	4	-	155	80	-	561
8	-	24a	3	-	82	2	-	160	22	-	564
1	-	26	4	-	89a	2	-	161			

1 Meccano Steam Engine
1 Dinky Toy Tyre No. 021

Please note that Nuts, Bolts and Washers are in approximate quantities only.