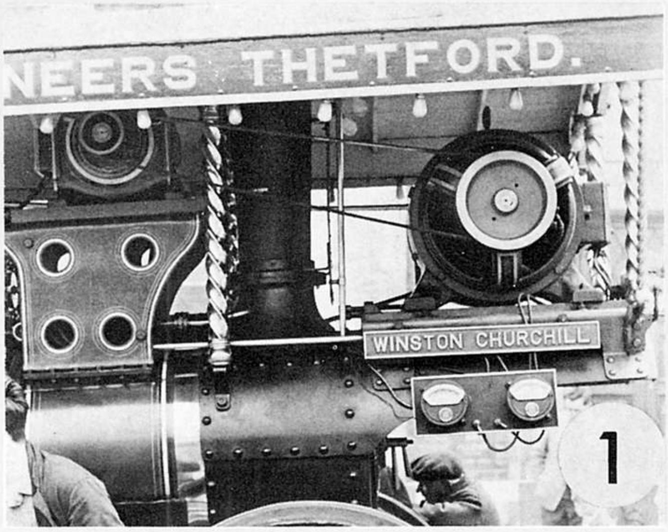
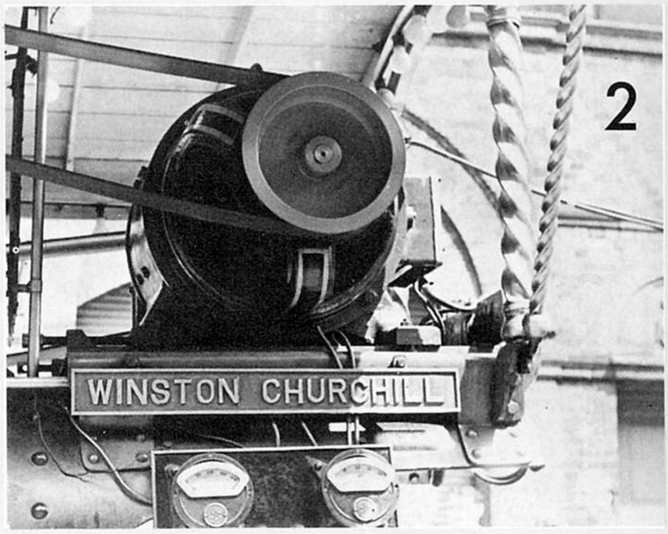




COLIN HAMILTON looks at DYNAMOS FOR SHOWMAN'S ENGINES

Steam Fairs are a popular hit with the public at large and Meccano enthusiasts in general, and the rides in such a fair should all be driven by individual steam engines built into the gallopers, cakewalks, steam yachts etc if the fair is to live up to its title. However, steam has a number of disadvantages, not least of which are the humping of coal and the time-lag in getting up steam.

As fairground rides became more complicated, the advantages of electrical power were utilized both for movement and illumination. By generating such electricity at a central point and feeding it across the fairground by cable, economy and convenience were achieved.

Normally a Direct Current is required for fairground machinery so that DC motors can be used with speed control circuits. In addition to this, the voltage is commonly about 120 volts (instead of the UK mains standard of 240 volts) as the lower voltage is considered to be below the lethal level in the case of electric shock.

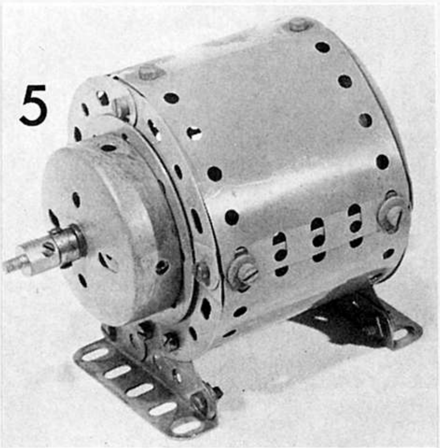
As the steam traction engine evolved into the Showman's Road Locomotive, the role of the flywheel driving agricultural machinery was changed to that of driving a dynamo mounted on a special cantilever bracket extending forward over the smoke box. Hundreds of examples are still seen today thanks to the enthusiasm which has preserved these juggernauts of the steam age, and the most common type is that of a single-unit dynamo often designed to supply the fixed set of 'rides' which that showman's engine towed from fair to fair.

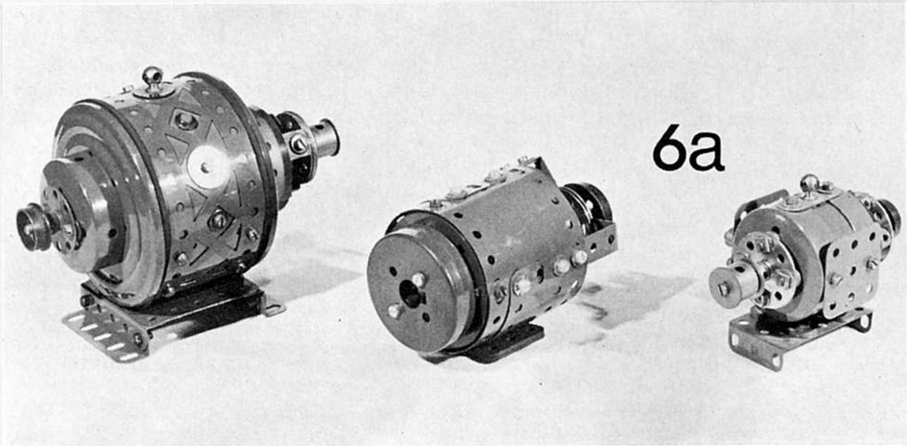
When the heavy-duty compound Burrells came on the scene, their additional horse-power enabled them to drive more powerful generators, but there is a limit to the size and weight of a dynamo which can be carried on a cantilever boiler bracket. In addition to this, the electrical 'load' carried by the dynamo could vary considerably according to the number of fairground rides in operation, their frequency of operation, and the standing load of illumination around the fairground.

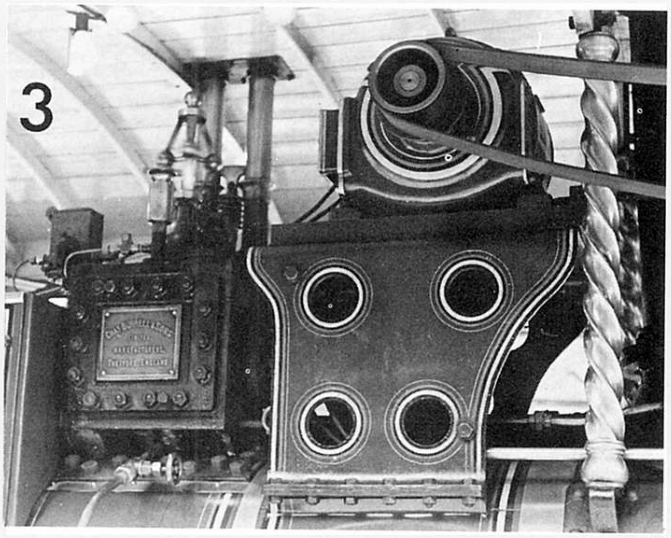
Fig 1 shows a method by which this problem was overcome: the famous Burrell showman's engine *Winston Churchill* is shown with two machines on different boiler mountings. The one in the normal place on the cantilever bracket is the main dynamo, and the smaller machine on the saddle bracket is known as a 'field exciter'. Both machines generate electricity, but that coming from the smaller machine is fed to the field coils of the forward dynamo to control the power output against the demand or 'load' of the fairground rides being energized by the showman's engine's dynamo. The smaller 'field exciter' and the main dynamo both have cover plates with instructions showing how machines can be converted from dynamo to motor operation.

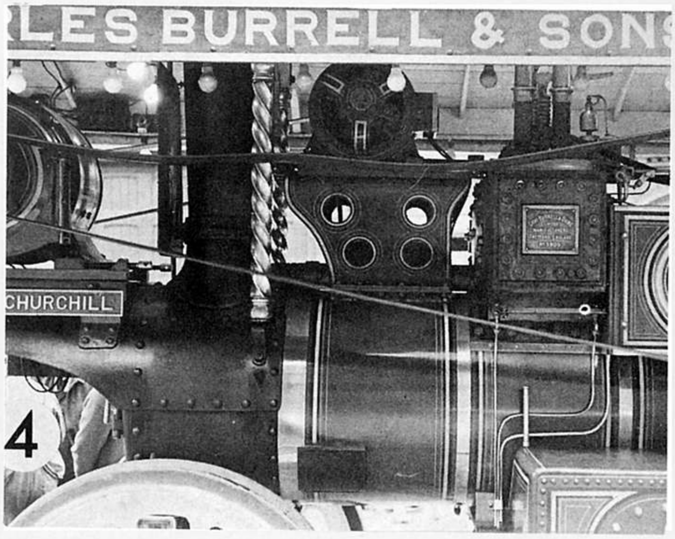
The general shots of Figs 1 to 4 show the two dynamos and the arrangements of brackets and belt drives from the main engine flywheel and from the offside pulley of the main dynamo to that of the field exciter. A number of modellers have reproduced this system, and a compact design is shown in the two well-known Meccano Books by Bert Love; on pages 81 and 83 of *Meccano Constructors' Guide* and pages 81 and 82 of *Model Building in Meccano and Allied Constructional Sets.*

Given a little thought and the unorthordox application of standard Meccano parts, it is possible to make dynamos of pleasing and realistic appearance. Taking the simplest form as conceived by the Model Room at Liverpool, Fig 5 shows a rather stark representation which has been used on the large-scale dealer's model of the Meccano Showman's Engine and has very little to commend it as a dynamo. However, as a large number of these had to be produced and assembled with an economy of parts and time, the bare outline served its purpose.









However, as the illustrations in Figs 6a and 6b show, it is not very difficult to make rather more interesting and realistic dynamos from standard parts. The smallest dynamo shown on the right of the photographs is still simple in construction, being two Boiler ends joined by an internal 2½"x1½" Flexible Plate, and the two 1½" □ Plates make a firm reinforcing, at the same time providing a heat shield for proximity mounting by the boiler chimney and, on the front side, a large terminal/dial board simulated by Collars on the middle row and Washers on the lower one.

Some years ago, Meccano Ltd, produced an all-black small Flanged Wheel, and these are worth preserving for use in mechanisms where the 'brassy' look is out of place. One of these is used as the offside back drive on the small dynamo while the main drive pulley is a double-flange type made up as follows. A Rod Socket is fitted with a ¾"Washer and a Chimney Adaptor which is locked in place on the threaded portion of the Rod Socket by a Threaded Boss. This, in turn, allows the outer ¾"Washers to be secured by a standard Bolt. If an antivibration fixing is required here, the outer ¾"Washer should be packed internally with standard or brass shim washers [Meccano Electrical part 561].

It is normally possible to see the bush gear and commutator on a fairground dynamo as one side is of open construction, and this has been achieved in each of the dynamos illustrated here. The medium-size machine on the left in Figs 6a & 6b has its diameter set by one external and one internal Face Plate attached to the external series of four 2½" □ Flexible Plates by Threaded Bosses, and this time the drive pulley is a large Flanged Wheel, also black, having been retained from the days of the 'black' parts.

The largest of the three Meccano designs is shown in Figs 7a & 7b, and its 'brush' gear is almost identical to that of the middle-sized dynamo.

A pair of 6-hole Wheal Discs form the outer bearing plate, and these are stood off from the Boiler End by a combination of 1" x ½" and ½" x ½" Angle Brackets overlaid by electrical Insulating Fishplates [Part 513]. A Socket Coupling forms the 'commutator' in this dynamo, and one end holds a Collar into which a Threaded Pin is inserted through the Wheel Discs so that a drive pulley — built as previously described — can be close coupled to the end bearings.

If Meccano bossed wheels are used, they often add that little extra width to the dynamo which makes it unwieldy when mounted on the engine bracket and this can put the dynamo drive right out of line with the flywheel belt. Some ½" Bolts, fitted with brass shim washers are passed through the fibre Fishplates to act as 'brushes' for the commutator.

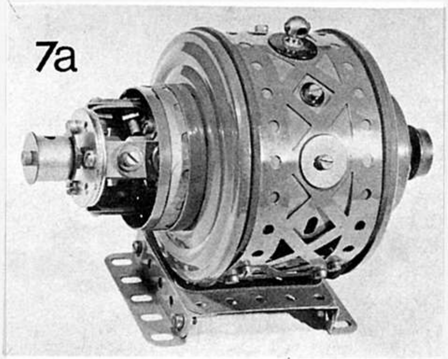
It so happens that a Boiler End will fit inside a Wheel Flange and still leave room for a ring of 2" Brass Flexible Strips [Part 530] to add 'gold line' decoration to the dynamo, and this can be seen in Fig 7a.

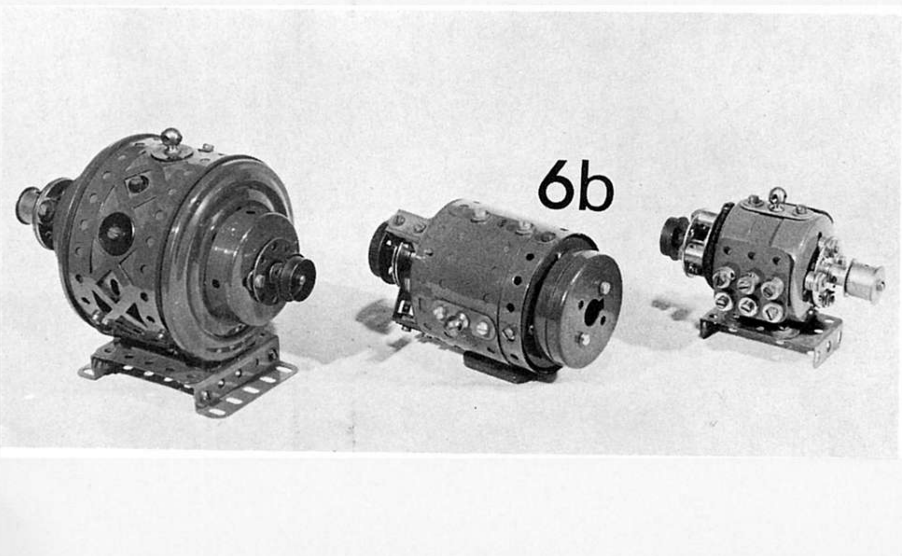
Ball Race Flanges form the outer ends of the dynamo casing, and a combination of internal Threaded Bosses and Threaded Rods hold these end plates together, at the same time trapping a 7½"Strip Plate curved between the Flanged Rings.

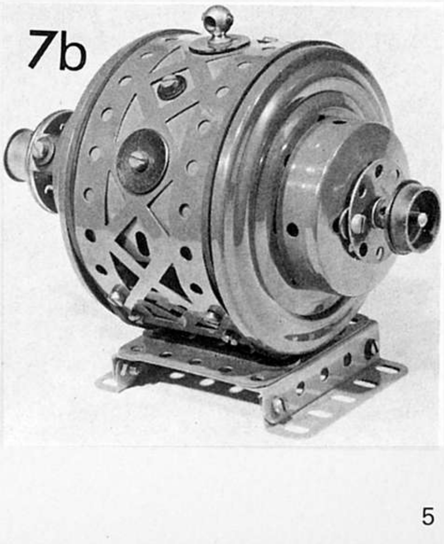
A 12½" Braced Girder (obsolete pattern) adds decoration and coverage to the dynamo case with holes filled in with Washers, and a neat capping is provided by a Handrail Support.

The object of this article is to get Meccano modellers thinking about the application of standard parts in unorthodox places to exploit the system to a wider degree. The human eye resolves detail better than the finest camera, and the observant modeller can re-create prototypes to a suprising degree of realism, as is shown by the superb Meccano models which grace the various club displays and exhibitions to which we are accustomed today.

Even the humble rubber band has a place; note that an otherwise ugly row of holes would show on the inner Strip Plate used for the large Meccano dynamo, but a pair of 10" Heavy Driving Bands are placed round the frame — just touching the rim of the Ball Race Flanges — and this adds the finishing touch!



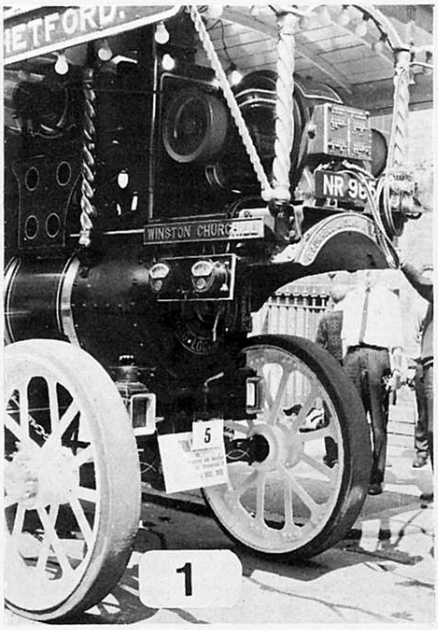




Modelling Showmen's Engines and Traction Engines in Meccano has now reached a very advanced form as the various Meccano Shows up and down the U.K. have proved in recent years, and the high standards achieved have been obtained by painstaking detail reproduced in standard Meccano parts and by close study of the correct proportions of the prototype on which the particular model is based. When a "glamour" shot of a real life showman's engine is taken, it is often done so from the view which clearly shows its front end, often because this is where detail and ornamentation proliferate as Fig. 1 illustrates. Winston Churchill is a Burrell compound Showman's Engine still taking pride of place at many a Steam Rally and such engines are favourites for Meccano modelling. However, choice of parts is very important and the selection of the Circular Girder or Hub Disc both for front wheels and for boiler dimensions is bound to get the proportions wrong immediately. It is quite obvious in the case of the Burrell, looking at Figs. 1 and 2, that wheel diameter and boiler diameter are quite different.

If the smaller scale of modelling is adopted as in Figs. 5 and 6, then the 3" Spoked Wheel and the Meccano Boiler do give a reasonable proportion, but if the front wheels are based on a 5½" diameter, then the boiler must be reduced in diameter to compensate and the illustrations in Figs. 7 and 8 show excellent results by advanced model-builders in getting the proportions right. We must be careful not to be too pedantic about proportions because they vary according to maker and as to whether an agricultural machine or a road locomotive is being modelled.

Constructors who want the best take the trouble to write to the makers, or to study published works giving full dimensions (and often detailed drawings) of the prototype they wish to model. They then do some careful paperwork to scale down the original.



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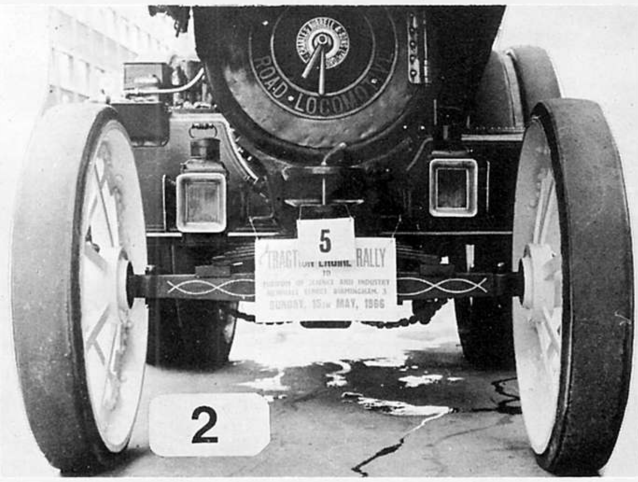
In this second article on traction engine modelling COLIN HAMILTON looks at ...

FRONT ENDS ON SHOWMAN'S ENGINES

If a standard Meccano part does happen to scale in correctly and has acceptable internal proportions of its own, i.e. flange depths, etc., then all well and good, but where this does not apply, the patient enthusiast simply builds up the required part to correct scale. This often involves a high degree of skill, imagination and patience on the part of the model builder if he is to achieve the results shown by the standards of Figs. 7 and 8. Indeed, Fig. 8 shows a front wheel construction for a Burrell compound Road Locomotive in which everything is built up from Narrow Strips, Curved Strips, Wheel Discs and gently curved Flat Girders.



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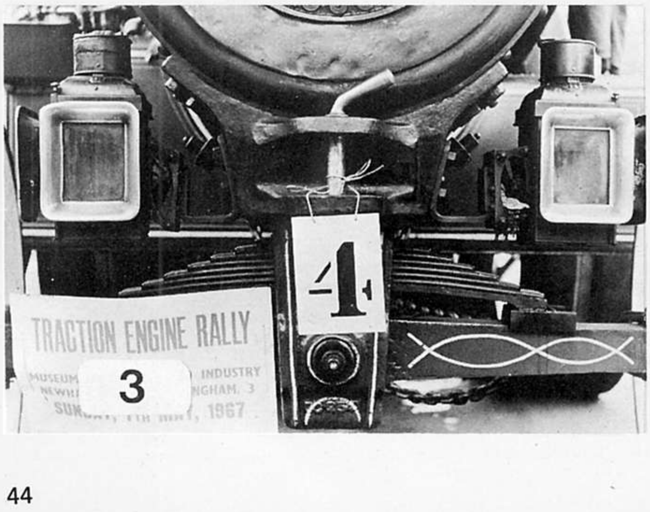

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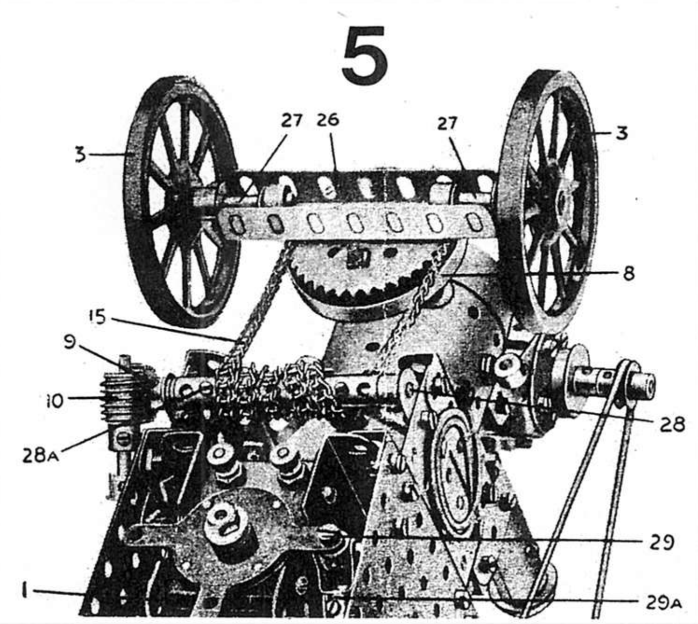
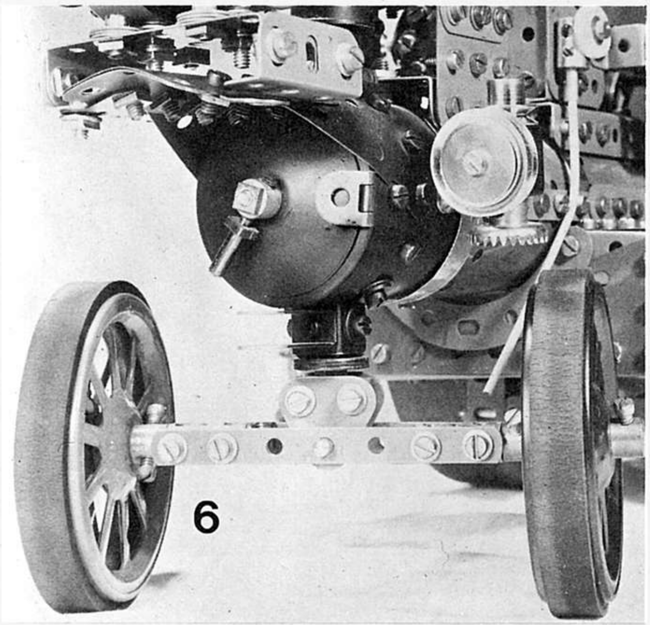
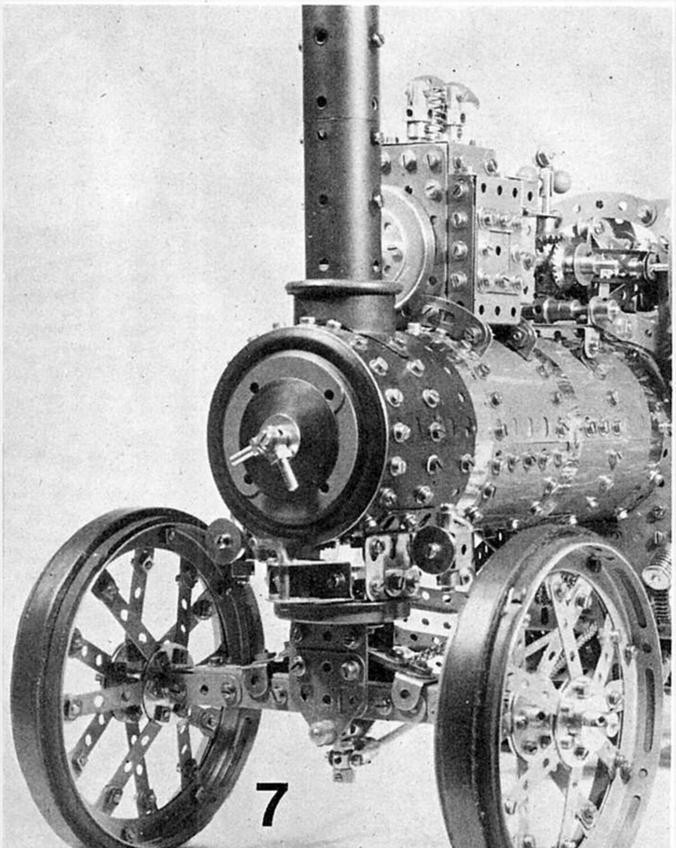
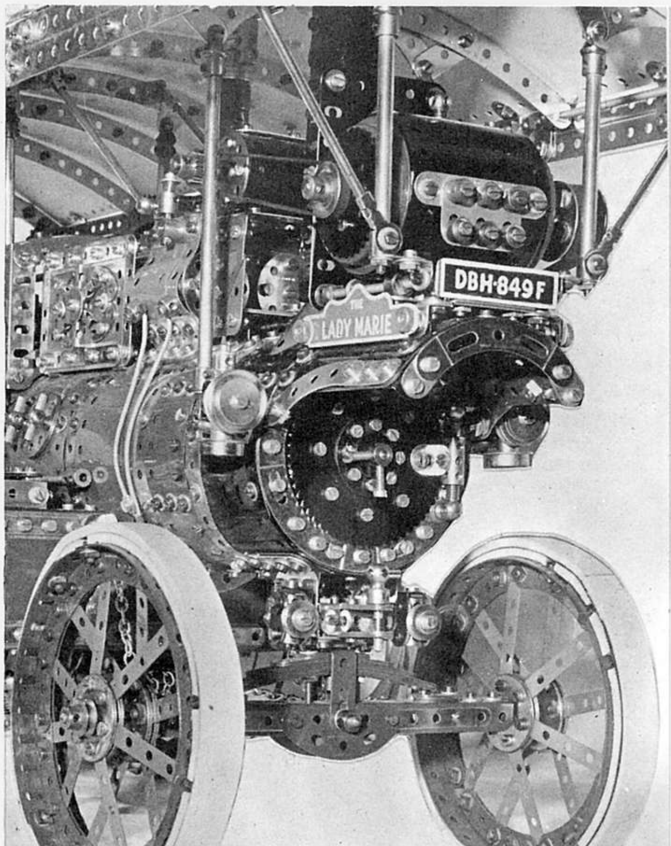


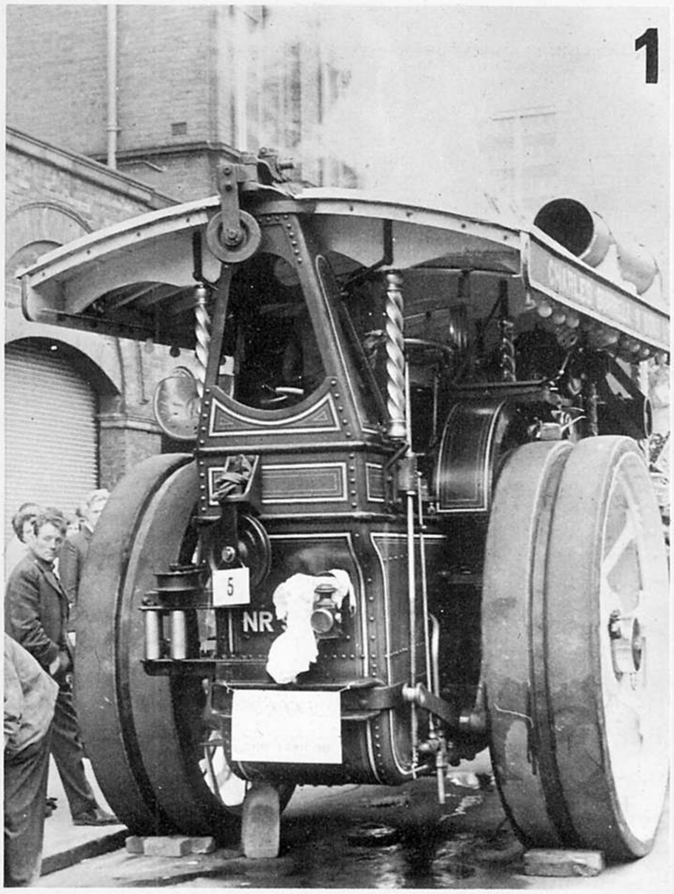


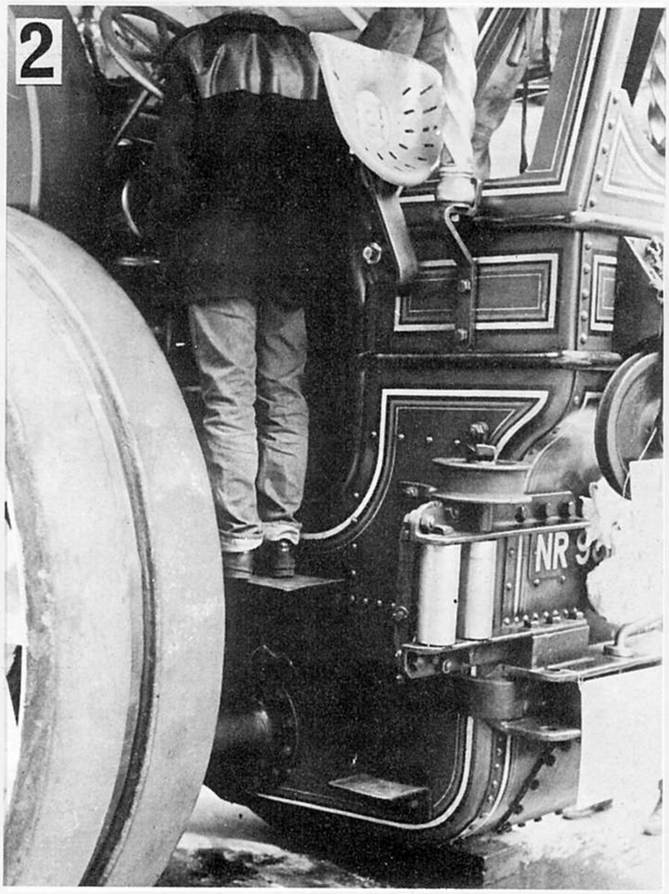
A well-loved, but badly proportioned pre-War design of Meccano Traction Engine has its steering gear shown from below in Fig. 5. The 2" Sprocket Wheel bolted solidly to a Wheel Flange give a rigid vertical steering pivot allowing no 'float' for the front axle when negotiating uneven ground. Some constructors have emulated this design and even incorporated Meccano Ball Bearings in a complicated steering swivel. Scaled up, such ball bearings would be as big as tennis balls! Essentially, traction engines or road locomotives have a simple front beam axle on a simple, but universal, central pivot. This is clearly shown in Figs. 6, 7 and 8. These last two illustrations show how the job can be tackled in Meccano parts. In the case of Fig. 7, the model of an agricultural traction engine, the axle beam is braced from below by a strut running back to the steering base and the necessary sideways deflection of the axle is catered for in the swivel design shown. Fig. 3 makes it clear that the Burrell Showman's Engine is provided with a sprung front axle and this is reproduced by the modeller in Fig. 8 from standard parts. In this case provision is made for a vertical rise and fall of the axle as the spring flexes.

As in railway steam locomotives, the smoke box needs cleaning and an access door is required, as the close-up of the Burrell's front shows in Fig. 4. It is interesting to compare how two different advanced model-builders have tackled the reproduction in Figs. 7 and 8. Again, prototype makers are different for the two models and so is their work purpose and the boiler/wheel diameter ratio is not the same. These differences have been catered for in both models. A careful study of the illustrations in this article should help the enthusiast to discover the forms and details of the prototypes and some of the building techniques required to obtain realism in a Meccano model. A wealth of details abound on models and prototypes alike, but these will be dealt with separately in a later article.









Continuing his series on traction engine modelling, COLIN HAMILTON deals with

REAR ENDS OF SHOWMAN'S ENGINES

To the enthusiast's eye, the tail end of a good showman's engine is as interesting in detail as the front, and once again the famous Burrell outlines are illustrated here in Figs. 1 and 2 to typify the design. Not only were these massive engines the hauling and generating work horse of the showground, but they were also the mobile cranes of their day. Study of Fig. 1 showing the rear of "Winston Churchill" reveals various pulleys and guides which were fitted to these road locomotives to enable them to carry out winching or hoisting duties. If, for example, a roller coaster was being erected on site, certain sections required hoisting well above ground level, so the auxiliary equipment for the Burrell included a strong derrick post with a heel pivot-pin and this was inserted in the draw-bar of the engine in place of the towing-pin shown in Fig. 2. A fixed "topping Lift" (wire stay) kept the derrick post at a set angle while the cable on the engine's winching drum was paid out round the roller and two guide pulleys which can be clearly seen in Fig. 1. Note that the lower guide pulley is off-set to one side on the rear bunker plate to give a clear vertical lead to the hoisting wire. A pair of vertical rollers was also fitted at winch level to the rear of these engines so that straightforward horizontal winching for recovery or a remote derrick operation could be carried out.

A fine example of modelling the rear end of a Burrell compound is shown in Fig. 3 where the essential contours of the prototype are shaped in Flat and Flexible Plates. Strength and elegance are combined in the upper struts for supporting the derrick by use of standard Meccano Girders overlaid with Narrow Strips, a contrasting silver on green producing a very pleasing 'slimline' effect.

Most important is the scale of the bunker width which virtually matches that of the boiler diameter. A common fault, even today, in modelling traction engines in Meccano is to use a bunker width which is quite out of scale and which gives a very ugly squat appearance to the model. This trend was set some fifty years ago by the original Meccano Supermodel Leaflet for a Traction Engine and it is the well-known pioneering Meccano specialists of the last decade who have put the matter right. Fig. 5 shows a rebuild of the offending pre-war model where the bad scale of bunker width to boiler diameter is clearly seen, apart from complete absence of driver access! However, even with the general overall size of the early Meccano model, much can be done to improve matters as shown in Fig. 4. This time, a bunker width of four-holed Strips gives the correct proportions when combined with the Meccano Boiler up front. Even at this smaller scale, additional details are easily modelled as the towing winch, rollers and neat draw-bar tow-pin bracket shows in Fig. 4.

Agricultural engines also need careful attention to their rear end proportions when modelled in Meccano and an excellent rugged example of this is shown in Fig. 6. Careful attention to outline modelling is the first priority, i.e. getting the general scale and shape right. All additional details such as lamps, handrails, driver's steps levers and steering wheels then compliment what is already a soundly designed and soundly built model.

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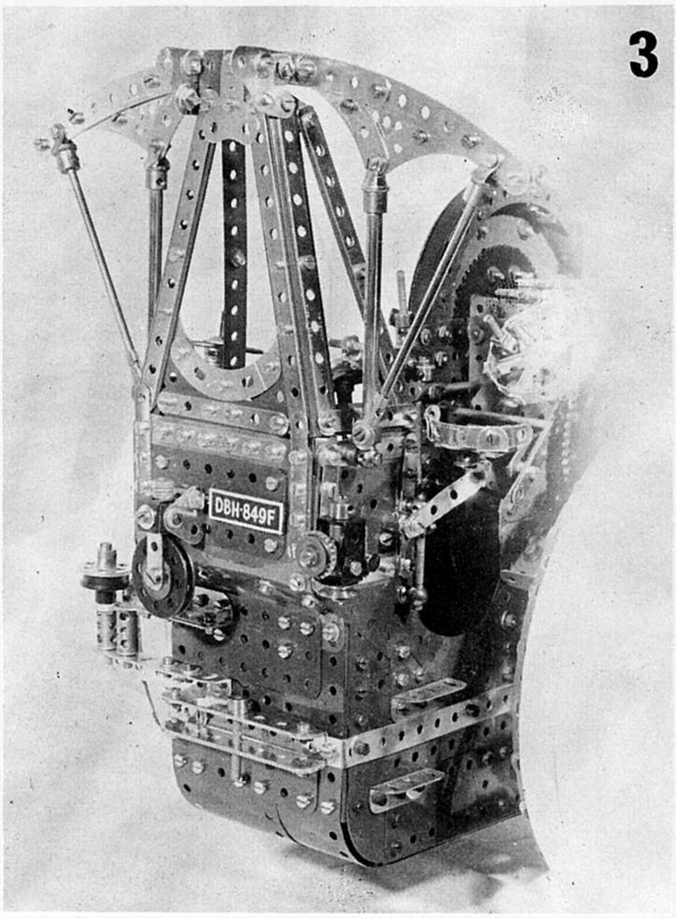

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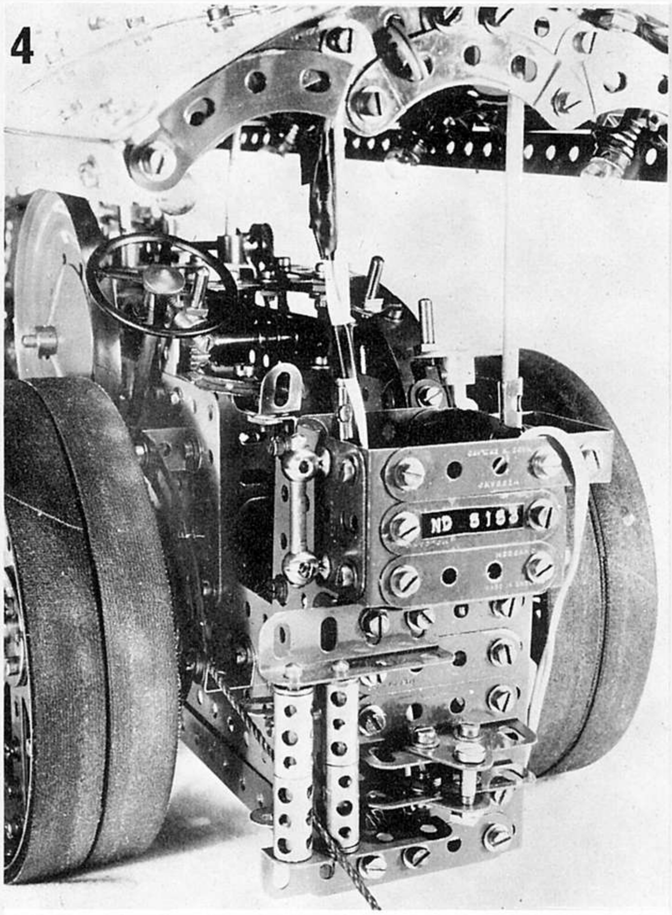

Fig. 1, a rear view of the well-known Burrell Compound Showman's Engine, "Winston Churchill"

Fig. 2, close-up of details on rear end of the Burrell. Note location height of vertical rollers and horizontal guide drum, and the off-set of the first derrick pulley

Fig. 3, a fine example of modelling on the rear end of a Meccano model of a famous Burrell Compound. Note excellent basic contours, scale and wealth of detail

Fig. 4, getting the scale right. Neat proportions of a well-designed model of the same basic size as that shown in Fig. 5

Fig. 5, how not to do it! Example of bad proportions on a pre-war Meccano Supermodel Leaflet design for a Traction Engine. Note "squat" and ugly shape of the rear end, with oversize width

Fig. 6, another example of excellent Meccano modelling on the rear end of an Agricultural Engine. Note the rugged wheel treads and clean access to the driver's compartment

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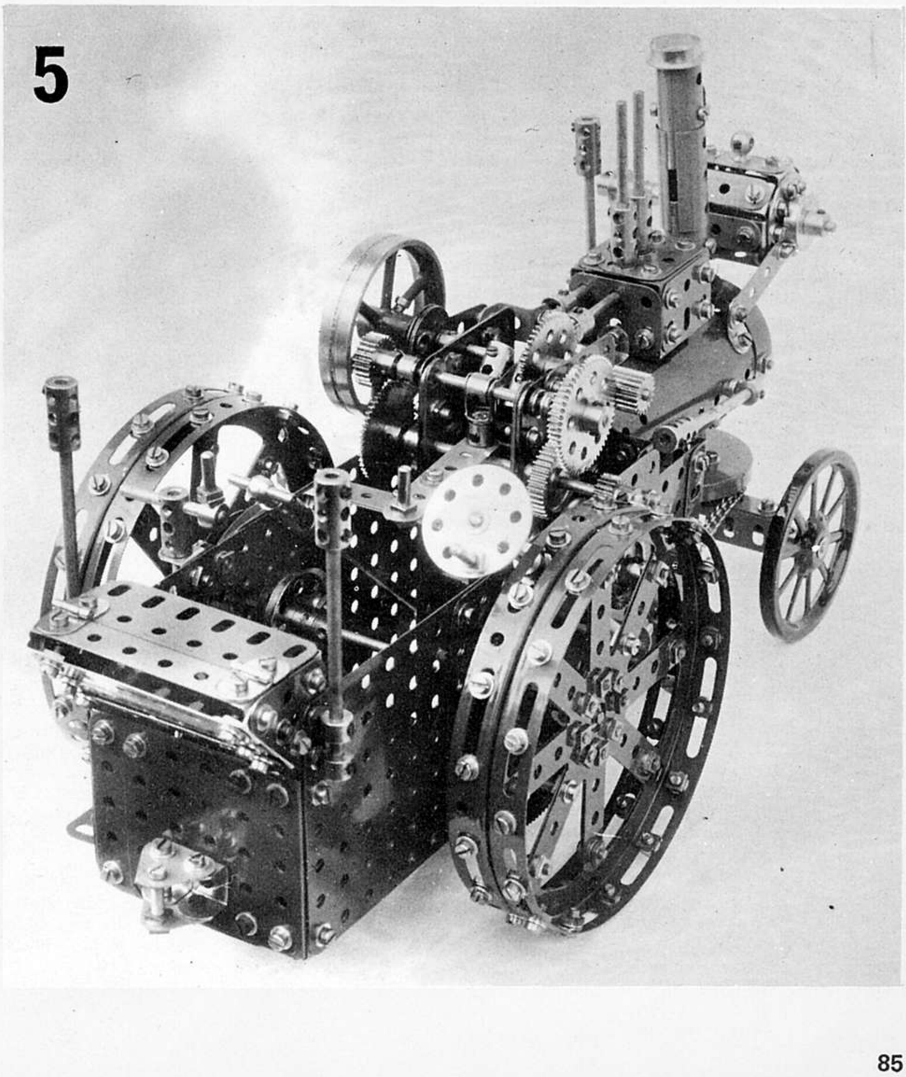

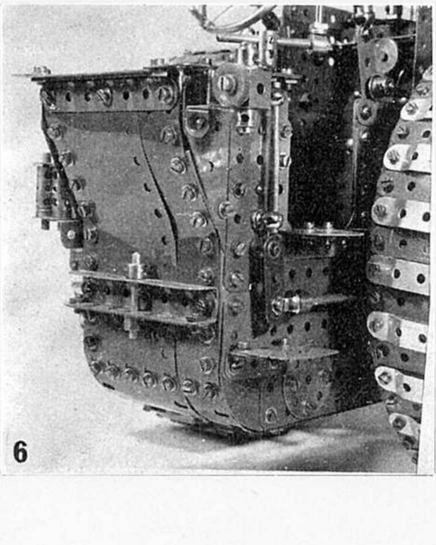

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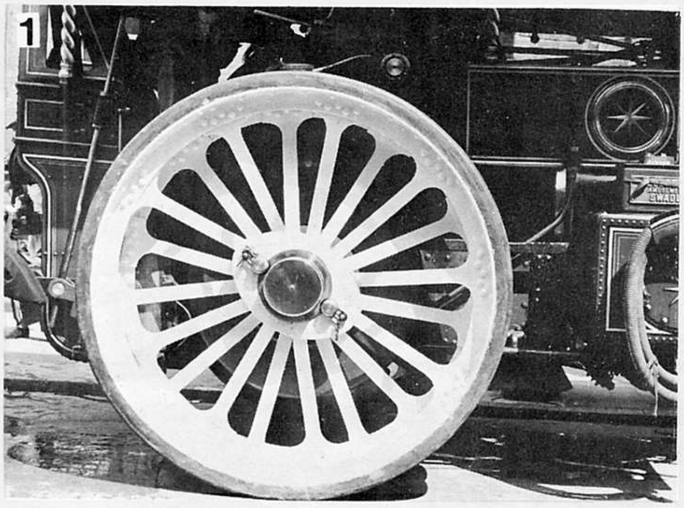

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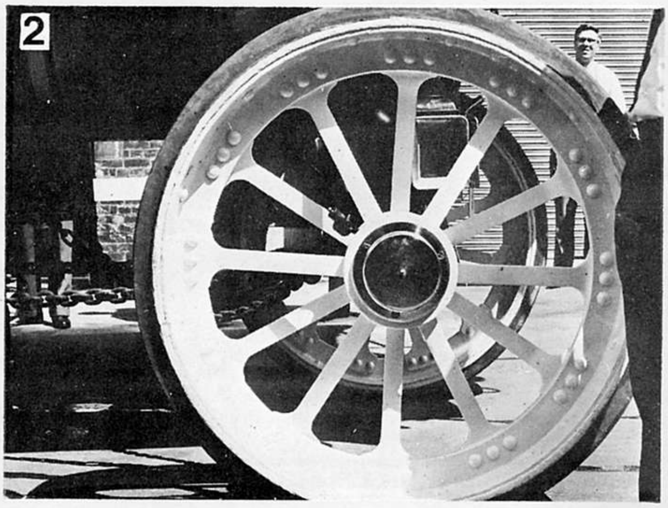

In Part 4 of his continuing series on traction engine modelling, COLIN HAMILTON turns his attention to...

ROAD WHEELS FOR SHOWMAN'S ENGINES

Given the tremendous appeal of the Showman's Road Locomotive to Meccanomen and general show-visiting public alike, it is surely incumbent on the modeller to achieve the maximum possible realism within the scope of his collection. Yet there is one area of the traction engine which, despite its high importance in overall visual effect, is often neglected. I speak of the road wheel which, front or back, is often a minor work of art in itself!

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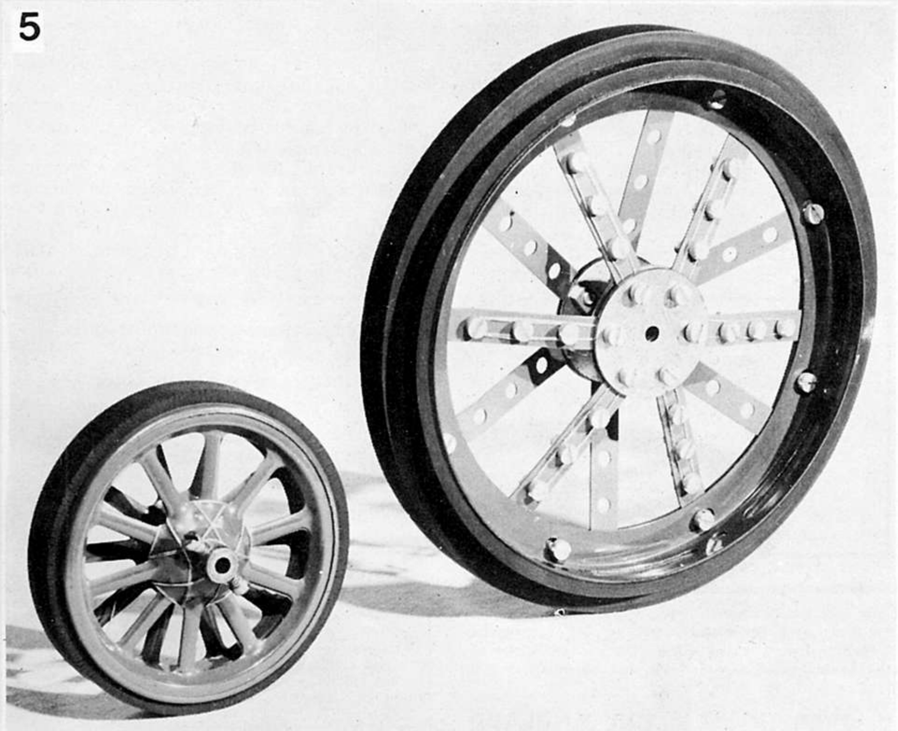
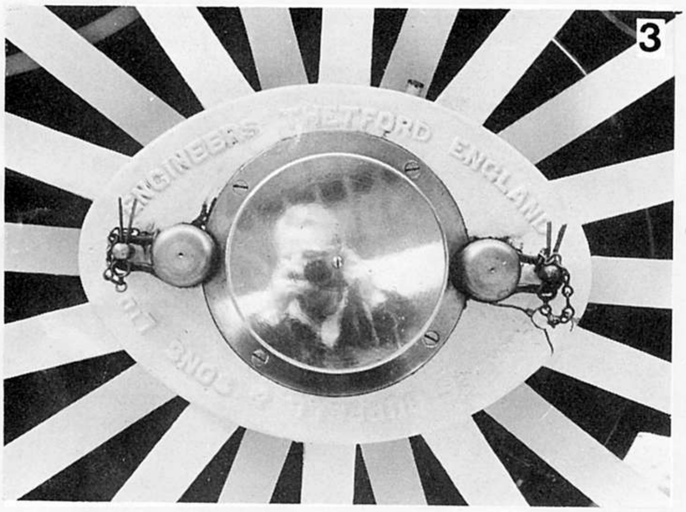


Designs of wheels for steam-driven road vehicles are many and various, but once again, a typical Burrell pattern is used as the basis for this article. Fig. 1 captures the elements of the rear wheel of a Burrell Showman's Engine in the stark silhouette which immediately shows a work of art as well as an engineer's sound design. Although the axle of the full-sized road locomotive is as thick as a man's arm, and a quite massive hub is forged to cope with the working and weight loads, the individual spokes of the wheel are slim and elegant by comparison. Nevertheless, the diagonal arrangement of the twenty radial spokes which gives an interleaved construction provides all the strength required and a stable wheel with high resistance to sideways buckling. Given a standard Meccano Boiler and a pair of 3" Spoked Wheels, the chances are that a Hub Disc will be pressed into service as the rear wheels of an elementary Traction Engine, or Showman's Locomotive, but the serious constructor would never be satisfied with this.

Fig. 4 shows just what can be done to break away from the Hub Disc. By using Circular Girders combined with Narrow Strips and by using a Socket Coupling holding a pair of 8-hole Bush Wheels in each socket, quite an elegant wheel can be built up giving the separated flanges required for the rear wheel of an engine. In the particular construction shown every spoke is secured at hub and rim, advantage being taken of Threaded Bosses which not only guarantee parallel spacing of the rims all the way round, but also provide captive points



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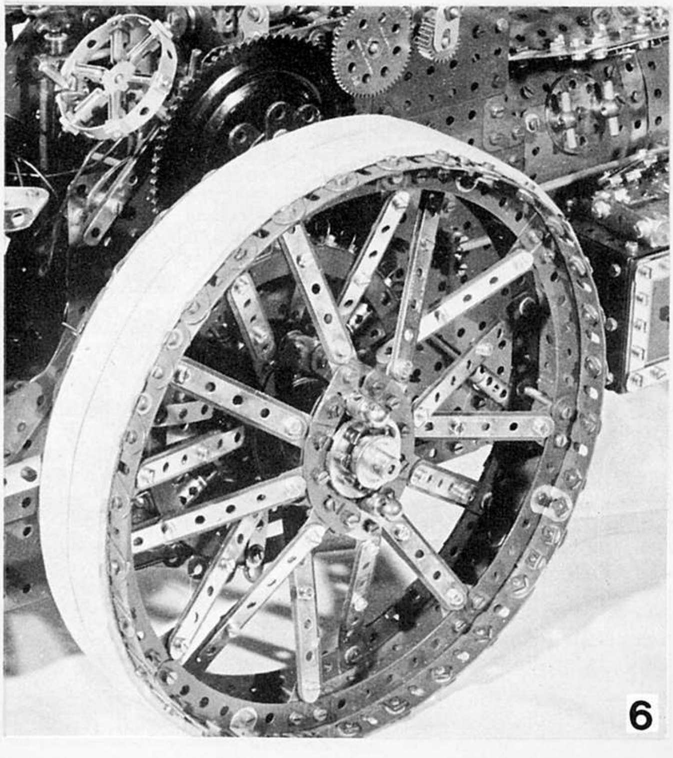
for the securing Bolts and leave no Nuts showing at the rims. It will be noted that substantial 'tyre' tread is supplied on the sample shown and these are actually used to trap double layers of Plastic Plates, 5½" x 1½" and 2½" x 1½", which form the outer faces of the wheels. Enterprising modellers keep a wary eye open for rubber belts on display in vacuum cleaner repair shops, lawn mower agents and washing machine stockists to make sure that they have a selection suitable for giving that professional rubber-tyred finish to their Showmen's Engines otherwise modelled in standard Meccano parts.

Looking at Fig. 2, which shows the front wheel of a Burrell engine, it will be noted that the wheel flanges are not separated. Since the greatest proportion of the engine's weight is located over the rear wheels, much lighter wheels of narrower 'tread' are required at the front end to facilitate steering. An acceptable simulation for the front wheels on the smaller scale is provided by Meccano 3" Spoked Wheels in pairs as shown in Fig. 5 and alongside this is a front wheel in Meccano parts when moving up to the larger scale road locomotives. Although Circular Girders and Narrow Strips are again the main components, only four of the twelve spokes are secured at the rim by bolting, the remaining eight simply being trapped between the Girder flanges as shown. Unless badly distorted bends are set into the Narrow Strips (a common fault in much Meccano model-building of traction engines, etc.) the Bush Wheels or Wheel Discs chosen for the hub must not be widely separated, or the 2½" Narrow Strips employed will simply not reach to the rim. Since modern Meccano Nuts are hexagon and accept 4BA size spanners, constructors will find that the use of 4BA Nuts & Bolts (cry heresy!) will just give that little bit of allowance with their slightly narrower shanks to let the Narrow Strips 'stretch' to the four points of the rim where spokes are actually bolted to the Girders. Where spokes are simply trapped by pinching, standard Bolts may be used at the hub.

In the same way that Hub Discs are often the popular choice for one size of rear wheel on a Meccano Traction Engine, so the Large Flanged Ring is often (and wrongly) 'favourite' for the larger rear wheel. Study of Fig. 6 will show that exactly the same diameter of wheel can be achieved by the use of a set of eight 4½" Curved Strips giving the correct depth of flange inside the rims. The flange of part No. 167b is far too deep for realism. In the construction illustrated, pairs of Flat Girders, edge to edge or side by side, are curved in a Meccano jig or bending roller to fit the curvature of the 4½" Curved Strips and secured by Angle Brackets at strategic points as shown. Long Meccano Bolts keep the wheel flanges parallel and overlaid 2½" Strips are set diagonally in every second slotted hole of the Flat Girders to join them round the face of the wheel. Something of a 'trick' is very successfully used in the construction of Fig. 6 to give the optical illusion of narrow spokes. This is achieved by overlaying the standard width Strips (in green) forming the spokes by 2½" Narrow Strips in silver. The illusion of narrow spokes thus created is quite striking.

Generally speaking, wheels on road locomotives are never fixed to their axles, but are free to revolve unless locked to the driving plate by pins. These can be seen in Fig. 3 on either side of the highly polished brass cap (reflecting the photographer at work!) Each locking pin has its own safety cotter pin preventing withdrawal of the locking pins by vibration. Both Figs. 6 and 7 show how this may be simulated in Meccano parts and in each case it will be seen that the model conforms to locking pin practice.

Finally, that extra touch of 'showground' decoration may be added to the wheels as shown in Fig. 5. Gold sewing thread is simply woven in and out of the spokes on the 3" Spoked Wheels nad locked under boltheads on the Narrow Strips used in the larger wheel of Fig. 5. Rubber belts complete the realism.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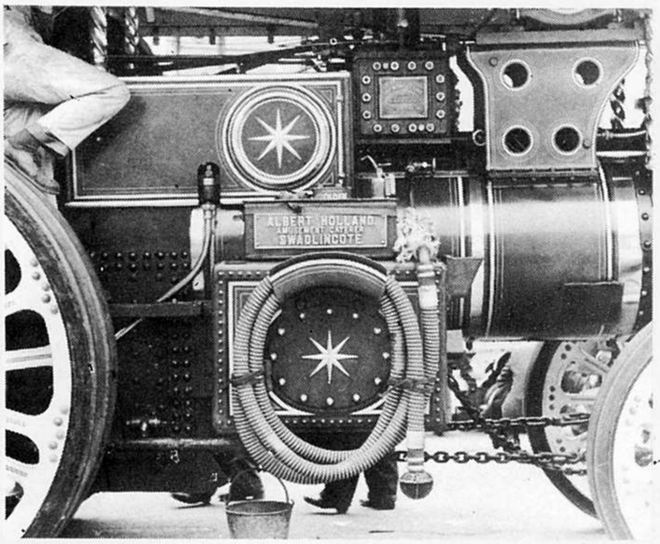


Fig. 1, side elevation of Burrell Scenic Locomotive 'Winston Churchill'. Note size of steam chest by comparison with boiler.

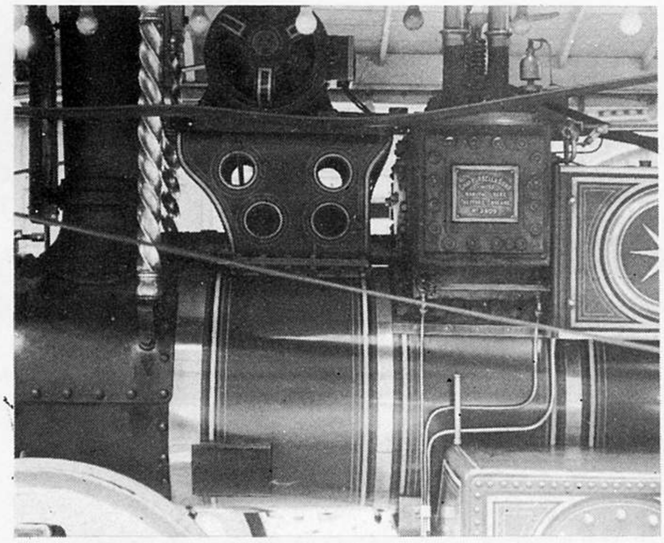


Fig. 2, a nearside view of 'Winston Churchill' showing symmetrical construction.

Part 5 of COLIN HAMILTON'S series on traction engine modelling deals with some of the features found in the central portion of a

SHOWMAN'S ENGINE

HAVING looked at the back and front ends of engines in previous chapters we now go on to examine in detail the midships portion of a typical Burrell Showman's Scenic Engine, using 'Winstone Churchill' once again.

Fig. 1 shows an excellent side elevation from which the proportions of the steam chest can be compared with those of the boiler on which it is mounted and the simplicity of the box-like structure should be noted by Meccano constructors who frequently go for a more ornate and curvacious structure at this point. Fig. 2 shows just how symmetrical is this scenic engine when viewed from the nearside (pavement side in the U.K.), but we need to study Fig. 3 to see that this Burrell design still has room to accommodate twin cylinders side by side, one being the high pressure cylinder (smaller circular end capping disc) and one low pressure cylinder (nearest camera) which makes use of the expanding steam from the high pressure exhaust part. 'Switching' of the steam from the boiler to the high pressure cylinder and then to the low pressure side of the steam chest is carried out by slide-valves outboard of each cylinder (but inside the steam chest) actuated by eccentrics on the main crankshaft. Simple twin quadrant gear allows the slide valves to reverse their phase so that the crankshaft will run in either direction.

Fig. 4 shows an attempt to reproduce a simple steam chest on a Meccano model which simulates, on the nearside, the squared-off box type of construction, but only one cylinder is attempted. End capping for this cylinder is provided by an 8-hole Wheel Disc with a ¾" Washer bolted in its centre. Both of these components are in black finish from earlier Meccano days and readers who have such parts from yesteryear should bear in mind the realism which such parts add to the 'smoky' parts of traction engines and railway locomotives. From Fig. 4 it is obvious that 3" x 1½" Flat Plates form the side shields of the connecting rod and eccentric gear and a crosshead of two Short Couplings on a 1" Rod runs in piston guides made from a 2½" Rod held by Collars to the side Plate and a 2" Rod mounted in a Rod Socket locked to the front plate of the steam chest. A slide for the eccentric connecting rod is simply a Slide Piece running on a 2½" Strip attached by a Fishplate to the steam chest side.

If we now look at Fig. 5 it is clear that our model shows a compromise in construction with a curved form to the 'offside' view of the steam chest. This is achieved quite simply by using a pair of Threaded Bosses internally to which the 8-hole Wheel Discs are attached at their '3 o'clock' and '9 o'clock' positions. A pair of 2½" x 1½" Flexible Plates are trapped under the top and bottom plates of the steam chest and curved over the offside to be fixed to the internal Bosses by an overlaid 1½" Strip and Washer-packed Handrail Supports as shown.

Top plates on traction engine steam chests are the normal place to find mountings for steam whistles, safety valves, regulators, or governors, and vertical exhaust steam pipes.

Fig. 3, the front end of a Burrell steam chest showing high and low pressure cylinder plates.

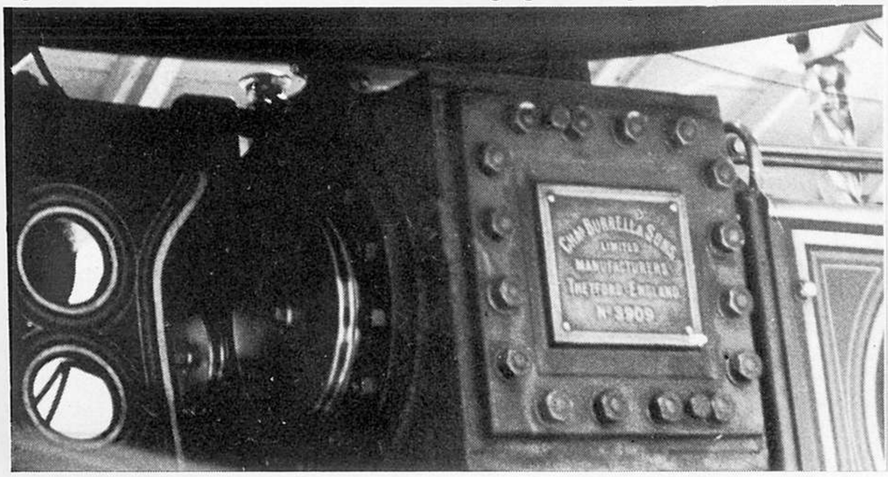
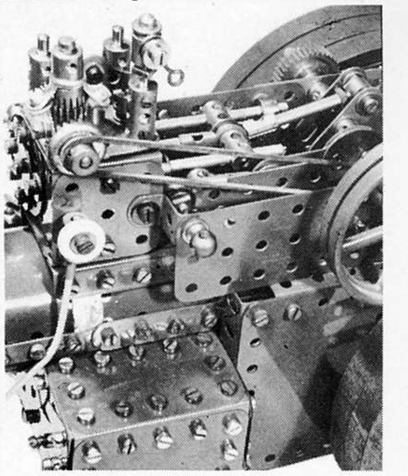


Fig. 4, the steam chest and single cylinder motion on a simple Meccano model.



Figs. 4 and 5 show how these items are modelled in standard Meccano parts. Modelling to this 'scale' (roughly speaking) requires compact construction and the centrifugal governor in this case uses a small Contrate Wheel drive to a 15t Pinion, the actual boss of the Contrate forming the drive pulley connected by a 6" Driving Band to a ½" fixed Pulley on the crankshaft. A Small Fork Piece has its lugs splayed outwards as shown and weighted with Set Screws attached by single Nuts to form bob-weights. The friction between the boss face of the 15t Pinion and that of the Fork Pieces is sufficient to give a realistic rotation on the 1⅛" Bolt set in the Coupling below.

A complete steam whistle can be seen in Fig. 4. Below the top plate of the steam chest, two Long Threaded Pins are set into the ends of a pair of 3" Girders running across the top. A standard Threaded Pin is similarly attached to support the Coupling forming the post of the steam whistle in the opposite corner of the steam chest at the top, (see Figs. 4 and 5). A 1½" Square Plate is dropped over the three Threaded Pins and two Couplings on the offside Long Threaded Pins clamp this Plate in place. Completion of the steam whistle is via a second standard Threaded Pin on to which is screwed a Threaded Boss fitted with an electrical Contact Screw, packed up by Washers, and a Wire Hook is trapped by Washers on a Set Screw in the side of the Boss. If a piece of Meccano Cord is attached and run back to the driver's position, the whistle is completed.

Location and design of these accessories gives the modeller great scope to exercise his choice of standard 'brassware', etc. to simulate the items referred to above and if the modeller has no access to the real locomotives, then library books should provide numerous illustrations of all these accessories. Illustrations in these articles can only begin to point the modeller in the right direction. Similarly, construction of the crankshaft in a Meccano traction engine can be simple or complex. That used in the excellent Fowler Ploughing Engine featured on the cover of the previous M.M. is a solid Meccano Axle Rod making use of four Meccano Eccentrics to give the twin cylinder and valve-gear motion required. Fig. 4 shows how a built-up crankshaft is made for a single cylinder engine. A start is made by setting up two Double Arm Cranks on any Meccano Rod and connecting the non-slotted ends by a ¾" Bolt and lock-nuts, spaced by appropriate Washers to permit a Collar to rotate freely. A standard Threaded Pin is fixed in a Rod Connector and screwed partially into the Collar. It is then a simple matter to extend the connecting rod from the Rod Connector as required.

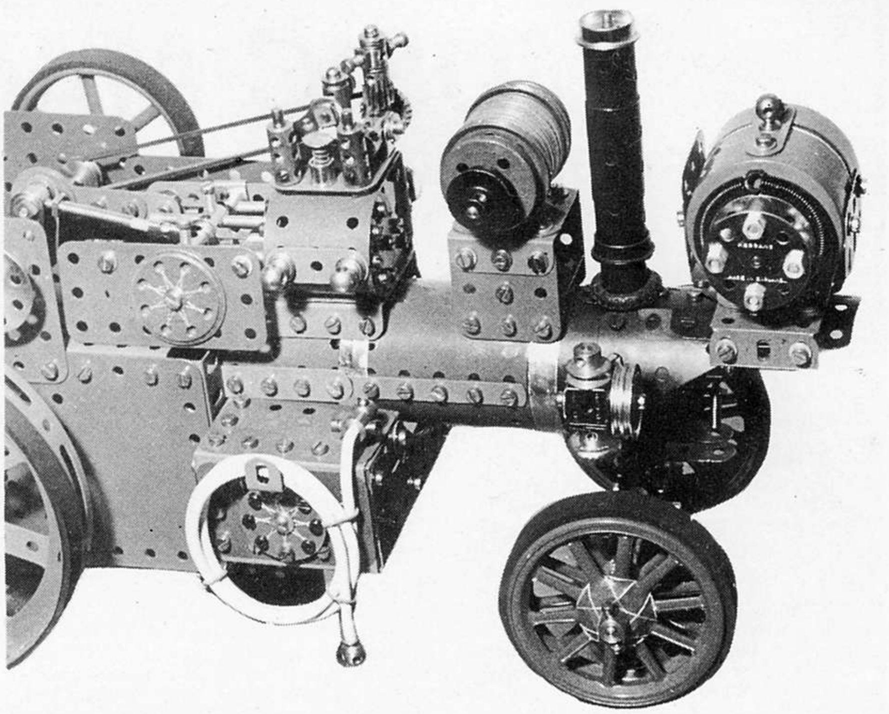


Fig. 5, an offside view of a Meccano showman's locomotive showing general features and ornamentation. Note simulated water hose and belly tanks.

Once the pair of Double Arm Cranks have been securely lock-nutted and checked they may be removed from the Axle Rod on which they were set up and then fitted with separate lengths of Meccano Rod to suit the crankshaft bearings. These bearings should be substantial and carefully set up. Double Arm Cranks make useful crankshaft bearings, or multiple layers of short strips, but they should always be set up by using a selected straight Meccano Axle Rod to ensure no binding when these reinforced bearings are bolted up at the final stages. Advanced modellers are able to extend this technique using pairs of Couplings as the webs of the crankshaft to make up twin crank jobs very effectively. Correct locking with appropriate grub screws can ensure that these built-up crankshafts run truly and for long periods at model shows.

Long-distance traction engines, including showmen's engines, had to plan 'water stops' very carefully and the fitting of belly tanks to augment the normal bunker was common practice for these road locomotives. Figs. 1 and 6 show the belly tanks on the Burrell together with the means of topping-up by suction hose from the local duck-pond, river or canal. Reproductions of these tanks in Meccano are shown in Figs. 4 and 5 where, again, Meccano Flexible Plates of yesteryear are used for choice by virtue of the absence of elongated holes. In addition, brass-finished Set Screws of the period add a bright touch to the appearance. A small diversion from standard parts incorporates about 50cm of Woolworths spring curtain cord to simulate the suction hose on the model as this particular plastic-covered spring cord takes the threaded portion of a Handrail Support internally to act as the suction filter and the other end of the curtain cord fits nicely into the bore of a Handrail Coupling mounted on a Threaded Pin to represent the hose connector on top of the belly tank.

General decoration on a scenic engine again gives great scope to the Meccano modeller's initiative and creative skill. The 'Star' pattern common to Burrell tanks and sideplates is reproduced here on the Meccano model by 8-hole Wheel Discs laced in the pattern shown by gold-coloured sewing thread, the same as that used to decorate the spokes of the front wheels.

When the 'scale' of the model goes up a size, many of the Meccano circular parts such as Conical Discs, Wheel Flanges and Curved strips may be utilised for embellishing flywheels and side panels on showmen's engines and examples of this skill are regularly seen at the Henley Meccano Show. Add to this the very wide range of colour contrasts available through changes in the Meccano colour schemes over the past three decades and the scope is enormous.

As in other road vehicles, showmen's engines need gears and differentials and these will be dealt with in the next article.

Fig. 6, a close-up of the Burrell belly tank showing typical 'star' ornamentation.