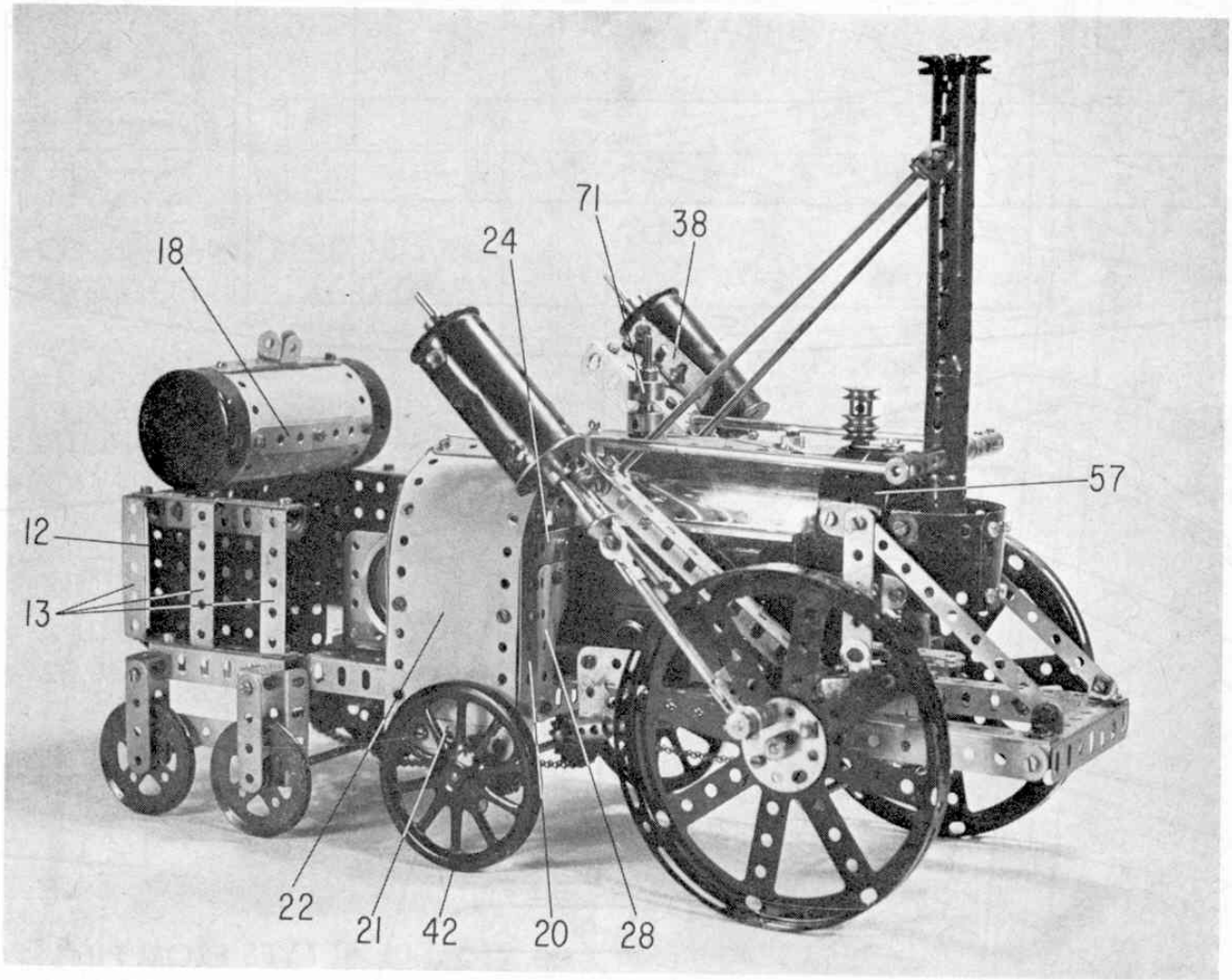


STEAM-POWERED "ROCKET"

'Spanner' describes an historic model built by M.M. reader Roger Le Rolland

George Stephenson's steam locomotive, the "Rocket", along with the Battle of Hastings, the Magna Carta and the exploits of Napoleon Bonaparte, is a morsel of history which has been fully digested by every scholar. For the railway minded more particularly, it is not difficult to visualise a frenzied crowd throwing their prim hats and bonnets into the Autumn sky at the famous Rainhill Trials of October 1830, when the puffing "Rocket" streaked along a section of the Liverpool and Manchester Railway, at the terrifying speed of 15 mph!

Stephenson won £500 on that occasion, the prize offered by the directors of the Railway for the engine which would give the best performance on a level length of their track, a length situated at Rainhill Bridge, Lancashire—hence the title of the trials.

Sadly, the era of workaday steam locomotion has disappeared from this land forever, leaving a romantic vision which cannot be equalled by sophisticated, modern engines. Such machines as Stephenson's "Rocket" and its contemporaries marked the beginning of the railway age, an industrious, furious time which resulted in the establishment of a comprehensive railway system covering the entire country.

Mr. Roger Le Rolland of Stoke-on-Trent, Staffs, has captured something of the spirit of this pioneering age with a working model of the "Rocket" which, I feel, would make the Tyneside engineering wizard proud to behold. Not only does it look like his uniquely-shaped original, it also works just like it, in that it is actually powered by live steam as supplied by the Meccano Steam Engine.

The accompanying photographs show Mr. Le Rolland's original construction, as opposed to an M.M. re-built version, and for this reason we would like to pass on Mr. Le Rolland's apologies for the fact that some of the parts are not in mint condition. They have, he explains, seen years of service. Also, although the accompanying photographs are in black-and-white, it will be noticed from the shading of some of the parts that their colour is not compatible with

Meccano colours for those particular parts. The simple reason for this is that Mr. Le Rolland has re-painted some of his parts and, in a few isolated cases, has departed from "official" colours. Whatever the colours, however, the model itself is captivating.

As I have stressed on several occasions, one of the attributes of the Meccano Steam Engine is that its design enables it to be used not only as a power unit, but also as a strong, integral part of the parent model's structural framework, thanks to its large, rigid baseplate. In this case, the Engine provides a substantial section of the Rocket's chassis, but before completing the remainder of the chassis, the initial drive system should be assembled while there is still plenty of room to work.

The flywheel is first removed from the Steam Engine, then a 3 × 1½ in. Flat Plate 1 is secured to the side of the Engine baseplate, as shown, the rear end holes of the Plate coinciding with the third holes from the rear in the baseplate side. Bolted to the upper edge of the Flat Plate, one on top of the other, are a 1½ in. Strip, a Double Arm Crank 2 and a Double Bent Strip 3, all these providing bearings for a 2½ in. Rod held in place by a 2 in. Sprocket Wheel 4 and a Collar. A ¾ in. Sprocket Wheel 5 is fixed on the outer end of the Rod, then the flywheel is remounted on the Engine crankshaft. Sprocket Wheel 4 is connected to the Sprocket on the crankshaft by Chain.

Now bolted to the underside of the Engine baseplate, in the positions shown, are two 5½ in. Angle Girders 6 and a 4½ × 2½ in. Flat Plate, the forward securing Bolts in the latter case also fixing a 4½ in. Angle Girder 7 to the underside of the Plate. The vertical flange of this Girder is bolted to the vertical flange of rear Girder 6, while the sides of the Flat Plate are extended rearwards by two 5½ in. Angle Girders 8. Bolted between Girders 8 at each side are a 4½ × 2½ in. Flexible Plate 9 and a 4½ in. Angle Girder 10, the vertical flange of the latter extended upwards by a 3½ × 2½ in. Flexible Plate 11. A 3½ × 2½ in. Flanged Plate 12 is attached by Angle Brackets to each Girder 8, the end flange of this Plate also being bolted to Girder 10. The upper rear corners of the Plates at each side are connected by a 4½ in. Strip, which is also bolted to Flexible Plate 11.

Secured to the upper edge of each Flanged Plate 12 is a 3½ in. Angle Girder which is connected by three 2½ × ½ in. Double Angle Strips 13 to another 3½ in. Angle Girder bolted to the vertical flange of Girder 8. The Bolts fixing two of the Double Angle Strips to this lower Girder also fix a 3 in. Angle Girder 14 in place, a 2 in. Angle Girder 15 and a Double Bracket in turn being bolted to each end of the vertical flange of this Girder. Girders 15 are connected by a 3 in. Strip, while a 2 in. Strip 16 is bolted to the spare lug of each Double Bracket. The lower holes in Girders 15 at each side will later serve as bearings for the rear axles.

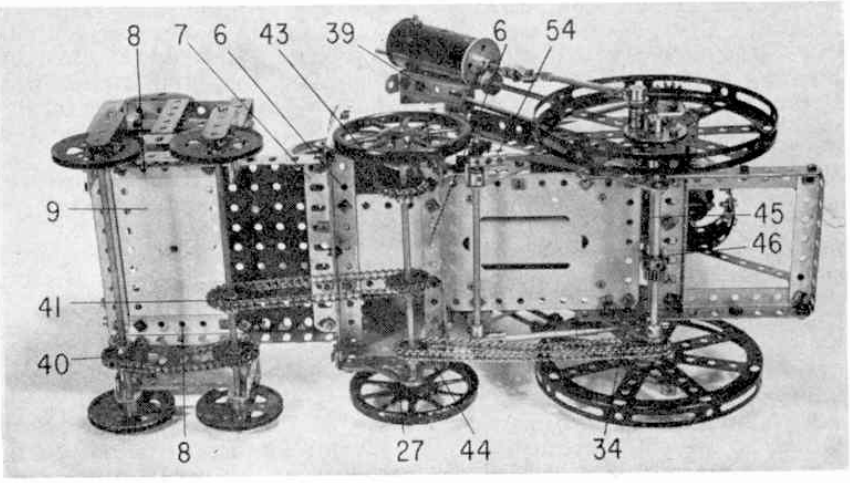
Bolted between the upper edges of Flanged Plates 12, in the position shown, is a 4½ × ½ in. Double Angle Strip, to which a 3½ in. Angle Girder 17 is fixed. Bolted to the free flange of this Girder is the water tank, supplied by a complete boiler, to which three Strip arrangements 18 are secured, one at the top, one at the front and one at the rear. Each arrangement consists of a 1½ in. Strip, a 2½ in. Strip and a 3½ in. Strip mounted one on top of each other, but note that two Double Brackets 19 are also bolted to the top of the upper arrangement to represent the filler-point.

At this stage the Engine drive mechanism can be enclosed. Bolted to the ends of Angle Girders 6 at each side are two 3½ in. Strips 20, the Strips projecting one hole below the Girders. The lower ends of the Strips are connected by a 2½ in. Strip 21, attached by Angle Brackets, the securing Bolts helping to fix a 5½ × 2½ in. Flexible Plate 22 to the Strip, while the upper ends of the Strips are each extended by a 2½ in. Stepped Curved Strip 23. Note that the connecting Bolts, in the case of the forward extensions only, also fix a 5½ in. Strip 24 between the Strips at each side. In the case of the rear extensions, the ends of Stepped Curved Strips 23 at each side are connected by two 2 in. Slotted Strips 25, each Slotted Strip being spaced from the appropriate Curved Strip by two Washers on the shank of the securing ⅜ in. Bolt. The central Bolt fixing the two Slotted Strips together also holds a Hinge in position, a 2½ × 2½ in. Flat Plate 26 being bolted to this Hinge to provide an inspection cover for the drive mechanism. A handle for the cover is supplied by an electrical Contact Stud held by Nuts in the opposite edge of the Plate.

Flexible Plates 22 are curved round to follow the contours of Strips 20 and Curved Strips 23 and are secured to the Strips by Angle Brackets, suitably placed. The upper edge of each Plate is overlaid by a 2½ in. Strip.

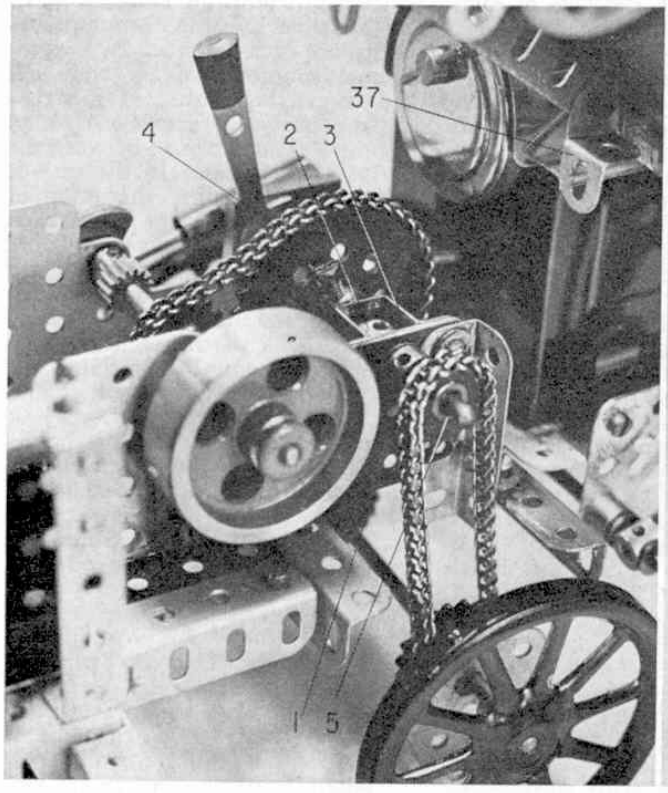
Bolted to each Strip 21 are two 1½ in. Corner Brackets 27, mounted one on top of the other, holes in these Brackets later providing bearings for another of the model's axles. Two Flexible Gusset Plates 28 are then bolted to forward Angle Girder 6 and attached to Strip 24 by Fishplates to complete the gearing enclosure.

The Engine baseplate is now extended eight holes forward at each side by two 5½ in. Angle Girders 29, the vertical flange of each of these Girders being overlaid by a 5½ in. Strip. The Girders are connected, through their end holes, by a 3½ in. Angle Girder 30, the securing Bolts also holding two Angle Brackets 31 in place,

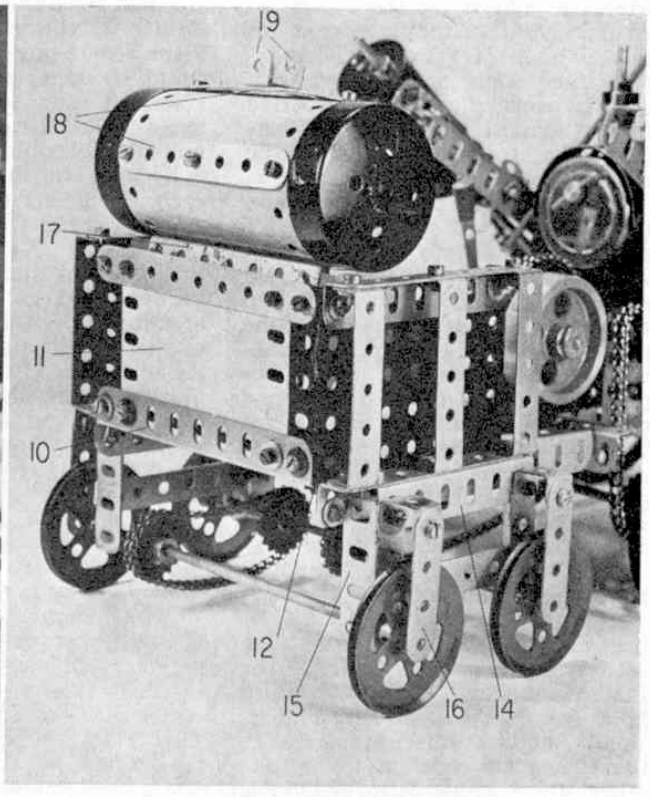


Opposite: George Stephenson, the father of the locomotive, would be proud of this live-steam reproduction of his famous "Rocket", designed and built by Mr. Roger Le Rolland of Stoke-on-Trent, Staffs.

The value of the Steam Engine's strong baseplate which enables the Engine to be used as an integral part of the main structure is evident from this underside view of the "Rocket".



A close-up view of the initial chain-drive system added to the Meccano Steam Engine, as it appears with the covering removed.



The tender of the locomotive, viewed from the rear. Note that the two rear axles are journalled in Angle Girders 15, only, and do not pass through Strips 16.

and through their seventh holes, by another 3½ in. Angle Girder 32. Bolted to this latter Girder is a 2½ × 1 in. Double Angle Strip 33.

Two 1½ in. Corner Brackets 34, one on top of the other, are secured to the side flange of each Angle Girder 29, the corner holes in the Bracket coinciding with the fourth hole of the Girder. These holes are left free to receive the front axle later. Bolted to the side flange of each Girder through the next hole forward is a 1 × ½ in. Angle Bracket 35, to the spare lug of which a 7½ in. Angle Girder 36 is attached by an Obtuse Angle Bracket. Towards its upper end, this Girder is connected to nearby Stepped Curved Strip 23 by a Corner Angle Bracket 37. Bolted to the upper end of the Girder is a Girder Bracket 38 to which a 2½ × ½ in. Double Angle Strip 39 is secured.

It is advisable at this stage to fit the axles and wheels. Four similar axles are each provided by a 6½ in. Rod, the two rear axles being journalled in the lower end holes of Angle Girders 15, where they are held in place by 2 in. Pulleys. The rear of these two axles is fitted with a 1 in. procket Wheel 40 which is connected by Chain to a similar Sprocket Wheel on the foremost of the two axles. This latter axle carries a second 1 in. Sprocket Wheel 41 which is, in turn, connected by Chain to another 1 in. Sprocket Wheel fixed on a 6½ in. Rod journalled in the centre forward holes of Corner Brackets 27 and held in place by Spoked Wheels 42. Also fixed on this Rod is yet another 1 in. Sprocket Wheel 43 and a ¾ in. Sprocket Wheel 44. Sprocket Wheel 43 is connected by Chain to Sprocket Wheel 5 on the Engine drive extension, while Sprocket Wheel 44 is connected to a ¾ in. Sprocket Wheel fixed on the end of a 4½ in. Rod 45 held by a Collar in the lower corner holes of Corner Brackets 34. A ½ in. Pinion on this Rod meshes with another ½ in. Pinion on a 4 in. Rod journalled in the Corner Brackets, immediately above Rod 45. This second Pinion meshes in turn with a third ½ in. Pinion 46 fixed on the front axle which is supplied by a 6½ in. Rod journalled in the upper corner holes of the Corner Brackets and held in place by Collars.

Each of the main driving wheels is provided by a Hub Disc 47, to the centre of which an 8-hole Bush Wheel is bolted. Secured to the face of this Bush Wheel is an Adaptor for Screwed Rod, on the shank of which five Washers and a Rod and Strip Connector are loosely mounted, being held in place by a Collar. Fixed in the Rod and Strip Connector is a 2½ in. Rod 48, on the other end of which another Rod and Strip Connector is carried, the latter Connector being pivotally connected to an End Bearing 49 fixed on the end of a Keyway Rod. This Rod slides free in the boss of a 1⅛ in. Flanged Wheel wedged in the lower end of a Cylinder 50 bolted to Girder Bracket 38. Another Flanged Wheel is wedged in the upper end of the Cylinder, the whole unit, of course, representing one of the two driving cylinders present on the original Rocket.

Held by a Collar and a ½ in. Pulley with boss 51 in one of the holes in the face of the Flanged Wheels is a 6½ in. Rod 52, on the lower end of which a Collar is fixed. This arrangement does not serve any practical purpose on the model, but is representative of one of the features of the full-sized original.

Now bolted to each side of the Engine baseplate, in the position shown, is a 1½ in. Angle Girder, to the vertical flange of which another 1½ in. Corner Bracket 53 is bolted. Held by Collars in the lower corner holes of this Corner Bracket at each side is a 5½ in. Rod, on each

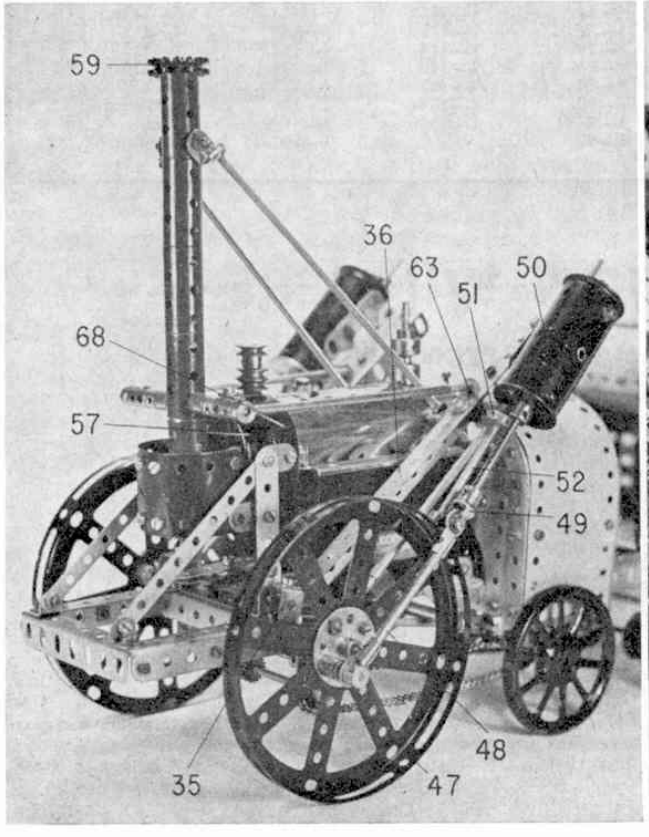
end of which a Coupling 54 is held by a Spring Clip, the Coupling being spaced from the Spring Clip and from the nearby Collar by a Washer in each case. Fixed in the longitudinal bore of the Coupling is a 4½ in. Rod, some 1½ in. from the other end of which a Right-angled Rod and Strip Connector is fixed. Lock-nutted to the lug of this Connector is a second Right-angled Rod and Strip Connector 55 fixed on the end of a 5 in. Rod, free to slide in the forward lug of Double Angle Strip 39. A sliding movement is imparted to this Rod by the action of a Collar (mounted, along with four Washers, on a ¾ in. Bolt 56 fixed to the inside face of the main driving wheel) knocking against the 4½ in. Rod held in Coupling 54.

The chimney can next be built up from five Sleeve Pieces, connected together by Chimney Adaptors. The lowest Sleeve Piece is mounted on two 1½ in. Screwed Rods held by Nuts in a Boiler End 57. The upper of the two Rods passes through the centre hole in the Boiler End and also secures a Chimney Adaptor to the inside centre of the Sleeve Piece. An Adaptor for Screwed Rod 58 is bolted to the top of this Chimney Adaptor, the shank of the Adaptor then being extended upwards by a 4½ in. Screwed Rod attached by a Rod Connector. This Screwed Rod projects through the Chimney Adaptors connecting the remaining Sleeve Pieces together, Nuts being tightened against the Chimney Adaptors to hold them rigidly in place. It will be found that the Screwed Rod projects a distance of approximately ¼ in. above the upper Chimney Adaptor which connects the first and second Sleeve Pieces. A Collar is screwed by one of its threaded bores on to this protruding end, then a Multi-purpose Gear 59 is tightly secured to the top of the Chimney by a 1⅛ in. Bolt screwed into the other tapped bore of this Collar.

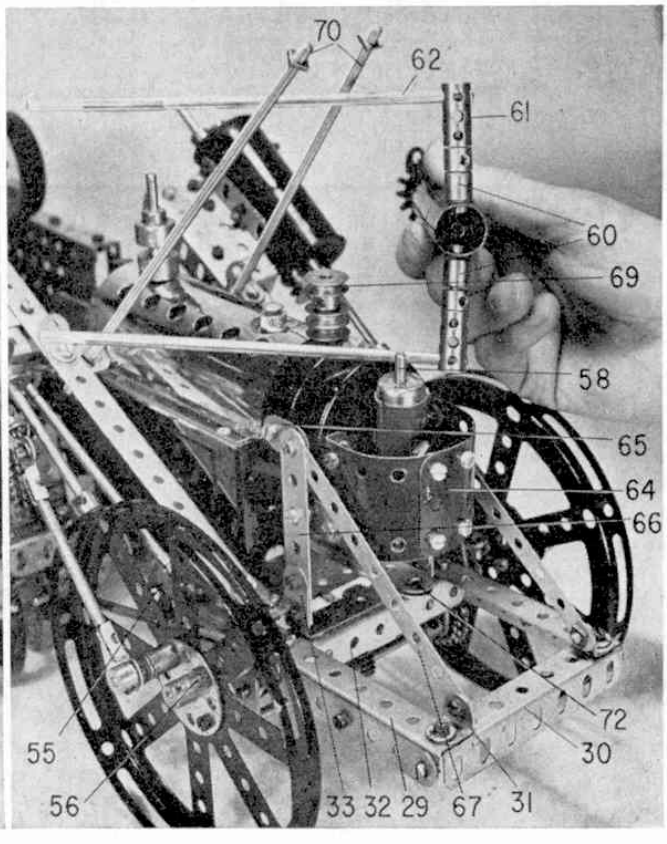
Bolted to the second Sleeve Piece from the lower end of the chimney are two Adaptors for Screwed Rod 60, each spaced from the Sleeve Piece by a Washer. A Collar and a Coupling 61 are added to the shank of each Adaptor, a 4½ in. Rod 62 being carried in the end transverse bore of the Coupling. This Rod is extended, via a Rod Connector, by a 1 in. Rod which will later be inserted into the spare hole of an Obtuse Angle Bracket 63 bolted to Angle Girder 36 through its sixth hole down.

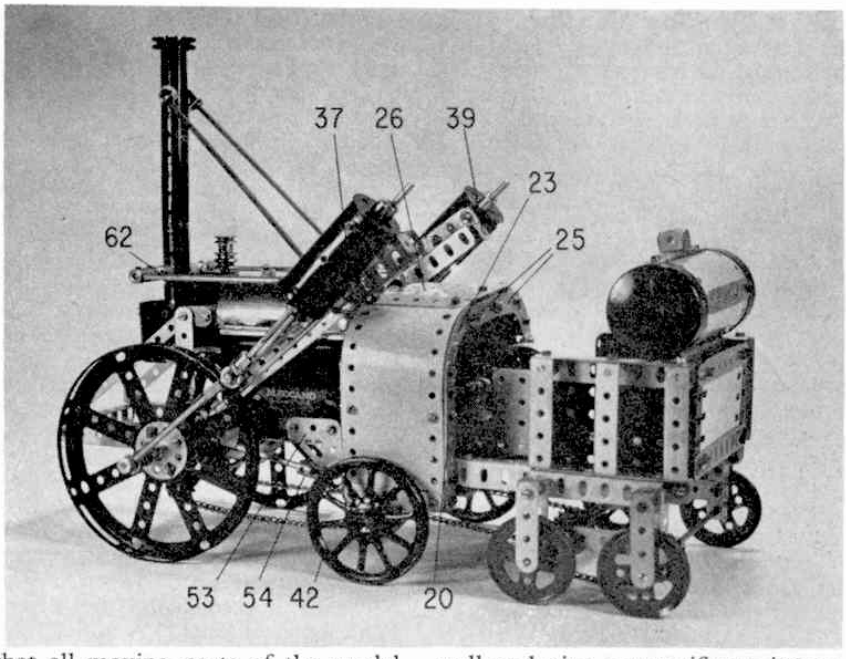
The base of the chimney is enclosed behind a 4 × 1½ in. compound flexible plate, 64, built up from two 2½ × 1½ in. Flexible Plates curved to shape and attached to Boiler End 57 by Angle Brackets. Bolted to each side of the Boiler End are a Fishplate 65, a 4½ in. Narrow Strip 66 and a 3 in. Strip 67, the Fishplate being spaced from the Narrow Strip by a Washer. Another Fishplate is bolted to the top of the Boiler End, then a second Boiler End 68 is fixed to the Fishplates to fit snugly against the first Boiler End. Note that a ¾ in. Bolt, shank upwards, is used to connect the second Boiler End to the upper Fishplate, two ½ in. loose Pulleys and a ½ in. Pulley with boss 69 being added to the shank of the Bolt, as shown. The lower corners of compound plate 64 are connected to Strips 67 by Fishplates, the latter being spaced from the Strips by three Washers on the shank of each securing ⅜ in. Bolt, then the whole assembly is mounted in position in front of the Steam Engine Boiler by bolting Strips 67 to the lugs of Double Angle Strip 33 and by bolting Narrow Strips 66 to Angle Brackets 31. Boiler Ends 57 and 68, of course, serve as

A close-up view of the front end of the model showing the assembly of the imitation drive cylinders and connecting rods.



In this close-up view of the front of the model, the chimney has been removed to show the fixture to which the upper Sleeve Pieces are attached.





Another general view of the "Rocket" showing the high standard of realism which Mr. Le Rolland has managed to achieve without becoming involved in unnecessary complication.

a false extension to the boiler of the Steam Engine.

With everything in position, the earlier-mentioned Rods carried in Coupling 61 are inserted into Obtuse Angle Brackets 63, further chimney-stays being provided by two 8 in. Screwed Rods 70, held by Nuts in Angle Brackets bolted to Angle Girders 36 and in further Angle Brackets bolted to the upper Sleeve Piece in the chimney. The final touch is supplied by a Socket Coupling 71, carrying an Adaptor for Screwed Rod, which is fixed on the brass cap protruding from the top of the Steam Engine boiler, towards its rear end.

Having built Mr. Le Rolland's Rocket, it will be found that the extended forward end of the Steam Engine makes it difficult to fit the methylated spirits burner into the firebox of the Engine. This problem can be easily overcome by simply extending the handle of the burner with 2½ in. Strips 72. It is important to stress, incidentally, that all moving parts of the model —particularly the imitation cylinder connecting rods—be carefully adjusted to ensure perfectly free-running. With everything in order, the model will operate extremely well and give a magnificent impersonation of the real thing. The only thing to remember is that the Steam Engine, being a genuine working unit, gets very hot and must be treated with due respect.

PARTS REQUIRED

3—2	2—9c	2—15	2—24	2—55a	5—96	2—161	2—192
1—2a	5—9e	3—15a	3—26	19—59	3—96a	1—162	2—201
7—3	2—9f	1—15b	1—27f	1—62b	3—111	2—162a	4—212
4—4	7—10	2—16a	2—35	4—63	1—111a	5—163	4—212a
10—5	6—11	1—16b	1—45	1—72	1—111d	5—164	3—213
4—6	28—12	2—18b	1—46	2—79	1—114	2—166	2—216
4—6a	2—12b	2—19a	8—48a	1—80b	2—118	1—171	2—230
2—8b	4—12c	4—20	1—48c	2—81	10—133	6—173a	2—235
6—9	6—14	4—20a	2—53	4—90a	1—154a	2—188	1 Meccano
2—9a	1—14a	3—23a	1—53a	1—94	1—154b	1—190a	Steam
7—9b		2—23b		1—95		1—191	Engine

CAR COMPETITION WINNERS

The postal strike rather upset our monthly Dinky silhouette competition; only 25 correct identifications were made of the March silhouette (Mercedes Benz 250 SE, Dinky No. 160) and we didn't have one in April due to the post difficulties. May, however, saw the entry back to normal; the car was the Alfa Romeo 33 Tipo Le-Mans (Dinky No. 210).

MARCH PRIZEWINNERS

P. Sims, Southampton; C. Donne, Chigwell, Essex; Roger Whiteman, Nottingham; Allan M. Cookson, Blackpool; M. Aggleton, Richmond, Surrey; Geoffrey Hughes, Northumberland; Raymond Levy, Manchester 22; Chris Stokes, Sanderstead, Surrey; Andrew Lewis, Co. Dublin; M. Robsin, Highcliffe, Hants; Nicholas Mitchell, Derby; Philip Northway, Dunfermline; David Edwards, Crawley, Sussex; David Martin, Hatch End, Middx.; John Runberley, Huddersfield; Stephen Sinclair, Liverpool 8; A. Peacock, Hertford; George Avery, East Putney; Peter Kent, London; Richard Newsome, Market Drayton, Salop; Brian Martin, Glasgow; A. Yarwood, Macclesfield; J. Campbell, Battersea; Paul Goddard, Barnstaple; K. A. G. Mackenzie, Truro.

MAY PRIZEWINNERS

T. J. Moore, Crowborough, Sussex; M. Reed, Hemel Hempstead; Paul Richardson, Cleckheaton; J. M. C. Mouat, Shenfield, Essex; James Morton, Sheffield; J. Flynn, Newbury; David Kirk, Leicester; David Peat, Aldershot; Mark Gilbert, Newark; W. R. Kerswell, Dorchester; J. Whittaker, Lichfield, Staffs; John Apps, Gerrards Cross, Bucks; William J. Vevers, Musselburgh, Midlothian; D. Lee Williams, Loughborough; David Sorrell, Chelmsford; K. Cowley, Sheffield; T. Bolt, Herefordshire; A. Sartain, Wiltshire; Neill Cudlip, Redruth, Cornwall; C. R. Weston, Nottingham; Richard Parkin, Hertford; C. S. Thompson, Kent; Kim Fullbrook, Braintree, Essex; Martin Pink, Surbiton; Peter Glynn, Birmingham; A. Boston, Bingley, Yorks; Ian Watts, Aylesbury; L. Glover, Yorks; Adrian Williams, Stratford-upon-Avon; Simon Cross, Ipswich; Nicholas Hudis, Ipswich; M. Denning, Epsom; Peter Fisher, Cannock, Staffs; David Abbott, Epsom; Simon Chandler, Royston, Herts; Nigel Dixon, Folkestone; Melvin Stamp, Reading; Ian Shergold, Reading; Nigel Harding, Cheshire; Robin Ashworth, Hull; Norman Tamblin, East Lothian; R. G. Thomas, Bristol; Matthew Claridge, Melrose; James W. Rowe, Camberley; William Yates, Oxfordshire; J. S. Napper, Alton, Hants; Andrew Farren, Coventry.