MECCANO® Magazine

AUGUST 1968 VOLUME 53 NUMBER 8

Meccano Magazine, founded 1916.

Editorial Director
D. J. LAIDLAW-DICKSON

Editor
JOHN FRANKLIN

Consulting Editor for Meccano Ltd.
J. D. McHARD

Advertisement Manager
ROLAND SUTTON

MAP **HOBBY MAGAZINE**

FRONT COVER

Artist Laurie Bagley captures the action as a Mk. II Sea Vixen takes off from H.M.S. Eagle.

NEXT MONTH

Watch out for the exciting scale model aircraft cover, and a report on the National Model Flying Championships. Also, in September issue are: Great Engineers, Stamps, Dinky Toy News, Meccano Models to build and another full size free model plan. We also have a more advanced than usual project for Model Railway enthusiasts, plus of course, A.B.C. of Model Railways.

Advertisement and Subscription Offices: Model & Allied Publications Ltd., 13-35 Bridge Street, Hemel Hempstead, Hertfordshire. Tel.: Hemel Hempstead 2501-2-3.

Second class postage rates paid at New York, N.Y. Registered at the G.P.O. for transmission by Canadian Post. American enquiries regarding subscriptions, news stand sales and advertising should be sent to MECCANO MAGAZINE, Eastern News Distributors Inc., 155 West 15th Street, New York, N.Y. 10011, U.S.A., U.S.A. and Canada direct subscription rate $5 including index.

Publishers of Aeromodeller, Model Boats, Model Cars, Model Engineer, Radio Control Models, Model Railway News.

MODEL & ALLIED PUBLICATIONS LTD.

13-35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTFORDSHIRE

CONTENTS

AMONG THE MODEL BUILDERS

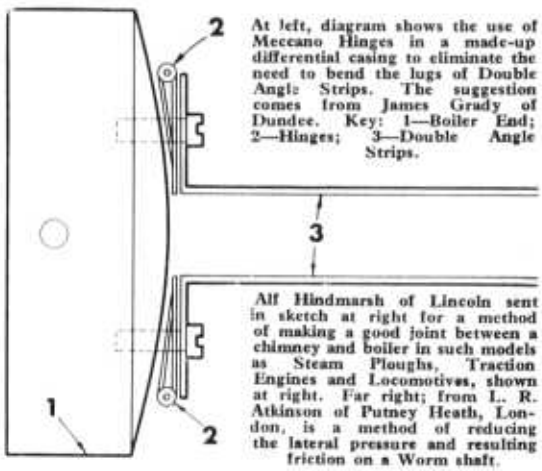
with Spanner

Mantel clock modifications

LAST MONTH M.M. reader Pat. Briggs of Nottingham gave detailed building instructions for a first-class Mantel Clock he had designed and built out of Meccano. Other readers who have since built the Clock or who have studied its design will know that, because of the simplicity and efficiency of the basic movement, the clock motion can be installed in other clocks of, as Mr. Briggs puts it, "more sophisticated appearance." Bert Love has sent me some photographs of just such another clock, this one also built by Pat. Briggs, and I thought it would be ideal to begin my article this month with a look at the new clock. Reproduced here, therefore, are a couple of Bert's photographs showing a traditional-style Carriage Clock incorporating Pat's basic design as featured last month. I leave it to Pat to comment on his first-rate model.

"The ornamentation," he says (and which is clearly shown in the illustration), "is achieved entirely with standard Meccano parts, apart from the dial and hands. A refinement to the original motion is included in this particular clock by making the anchor shaft itself from a 2 in. Elektrikit Pivot Rod, giving further reduction in overall friction and an increase in running time of up to 38 hours. Under these circumstances it is necessary to modify the crutch mechanism by attaching it to the anchor shaft internally and allowing the crutch pins to protrude through the rear of the clock case to engage the pendulum Collar, as shown in one of the accompanying pictures. In this event, the crutch must be of open triangular construction—to prevent fouling of the escapement rod immediately below it—and is made from two 2½ in. Narrow Strips bolted to a Double Arm Crank and spaced by Collars so as to clear the recessed Pivot Bolt."

This, then, is all that needs to be said about the modifications. The basic mechanism was fully described last month and the accompanying pictures are sufficiently detailed to give a good idea of the outer casing design. In effect, therefore, you clock enthusiasts now have two models to keep you busy—always assuming that you did buy last month's M.M.!



At left, diagram shows the use of Meccano Hinges in a made-up differential casing to eliminate the need to bend the lugs of Double Angle Strips. The suggestion comes from James Grady of Dundee. Key: 1—Boiler End; 2—Hinges; 3—Double Angle Strips.

Alf Hindmarsh of Lincoln sent in sketch at right for a method of making a good joint between a chimney and boiler in such models as Steam Ploughs, Traction Engines and Locomotives, shown at right. Far right; from L. R. Atkinson of Putney Heath, London, is a method of reducing the lateral pressure and resulting friction on a Worm shaft.

Differential casing hint

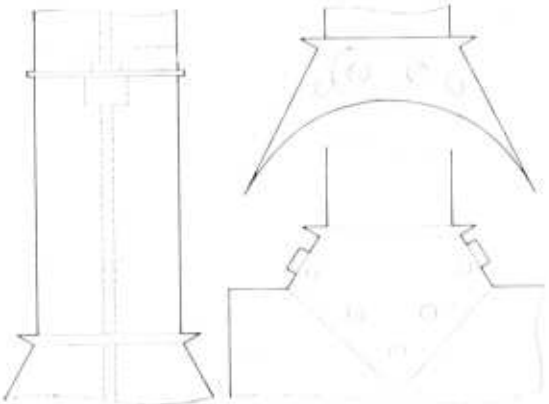
Moving northwards from Nottingham up to Scotland, we have a useful hint on differential casing construction supplied by James Grady of Dundee. "Many Meccano users," he writes, "find that, once a Double Angle Strip is bent, it is difficult to reset it at the original angle. This particularly applies when using Boiler Ends (in conjunction with Double Angle Strips) to form differential casings and the insertion of a Meccano Hinge eliminates having to bend the lug of the Strip."

The accompanying diagram shows how the Hinges are used in this particular construction and, having tried it myself, I can vouch for its success. James goes on to say, however, that, "By using this method, a Strip can also be laid successfully straight across a Boiler End." He's quite right, too!

Boiler/chimney joint

Our next offering comes from Alf. Hindmarsh of Lincoln who recently dropped us a line. "I am in the midst of building a 'Steam Plough' in Meccano," he wrote, "and have come up against the difficulty of a good joint between the chimney and boiler. This is how I've overcome it . . . (see accompanying diagram). I've utilised two parts 201 Flexible Fusset Plate, curved them, and bolted them to each other. The resulting aperture just takes a 1½ in. Pulley Wheel. One has only to use a suitable Threaded Rod, Cylinders and 1½ in. Flanged Wheels to get the desired effect, and the chimney can be made as tall as you like by simply adding Cylinders and Flanged Wheels."

Alf's idea has much to recommend it, particularly as it can be used not only with a Steam Plough, but with almost any model incorporating a chimney and boiler. It would be ideal for Traction Engines and Locomotives, provided they were made to a suitable scale.



Bending and straightening

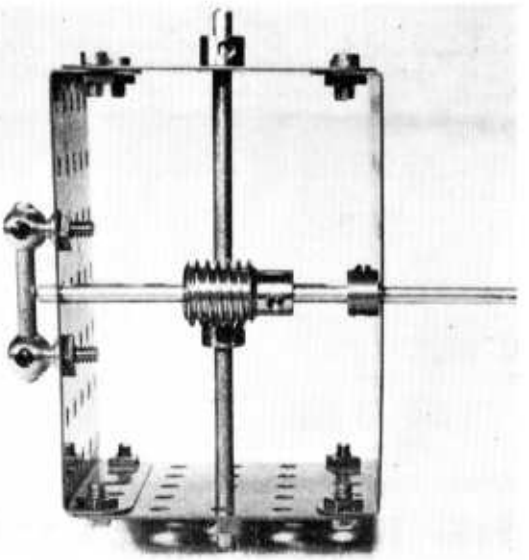
So as not to confuse you into thinking that the above sub-heading refers to a keep-fit-class, let me explain immediately that Mr. Grady's suggestion reminds me of the numerous letters we regularly receive on the subject of bending and straightening parts such as Strips and Flexible Plates. This is a problem which affects many enthusiasts, some of whom find that they occasionally bend parts beyond repair, so I feel justified in giving a few general pointers here.

When shaping a part for a model most damage is usually caused by the builder giving too sharp a bend to the part, thus fracturing the metal. The bend, in other words, looks like a geometrical angle, whereas it should really be more like a tight curve with no definite "point" in evidence. "Easier said than done," I can hear you muttering, but I must answer that it really isn't very difficult to produce a curve if you go about it the right way. In the Model-Building Department of Meccano Limited, for example, they have been shaping parts for something like half a century without any difficulty. Mind you, they have some special equipment to help them, but equipment which could easily be obtained by anyone.

It consists of nothing more than a set of six short wooden cylinders of different diameters ranging from about 3 in. down to about ½ in. (exact size is not critical). When, say, a Flexible Plate is to be bent, it is first formed round the largest cylinder, then the second larger, then the third and so on down through the cylinders until the correct shape is obtained. There's really nothing to it, and straightening the Plate again is just as easy. It's simply placed between two blocks of wood or metal on a firm surface—preferably the floor or a good, solid work bench—then the upper block is hit with a hammer. Admittedly, the result is not a new Plate, but at least the Plate will be perfectly useable, in most cases. And the cylinders? Any bits of scrap wood would do—pieces sawn off old table legs, broom handles, dowelling, etc. They're certainly not difficult to come by if you look out for wood scrap.

Reduced friction mounting

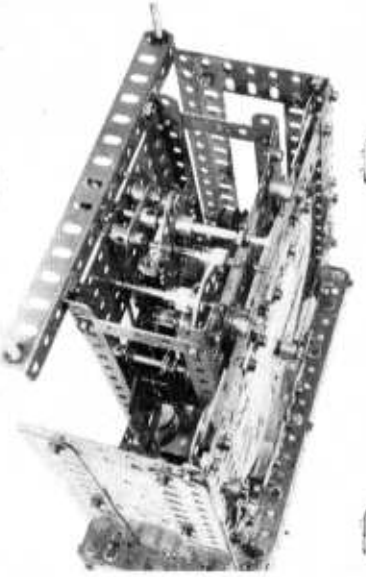
Finally this month we have another hint from L. R. Atkinson of Putney Heath, London who has had material featured in the last two issues. This particular idea is for an easy method of reducing the lateral pressure and resulting friction on a Worm Shaft. As you know, when a Worm on one Rod is used to drive a Pinion or



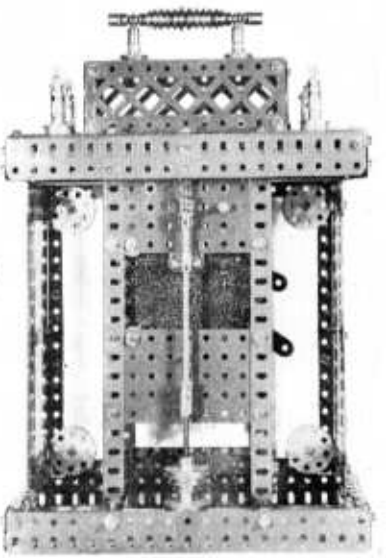
Gear on another Rod, the screwing motion of the Worm acting against the Pinion tends to force the Rod carrying the Worm away from the Pinion. If the Rod is held in place by Collars, for example, one of the Collars will be pressed against the Rod mounting, resulting in increased friction. This friction can be kept to an absolute minimum by doing away with the usual Collar and replacing it with a Rod held in Handrail Supports as shown in the accompanying photograph. The area of contact and therefore friction is thus greatly reduced and the reduction is even greater if the end of the Worm Rod is filed to a point.

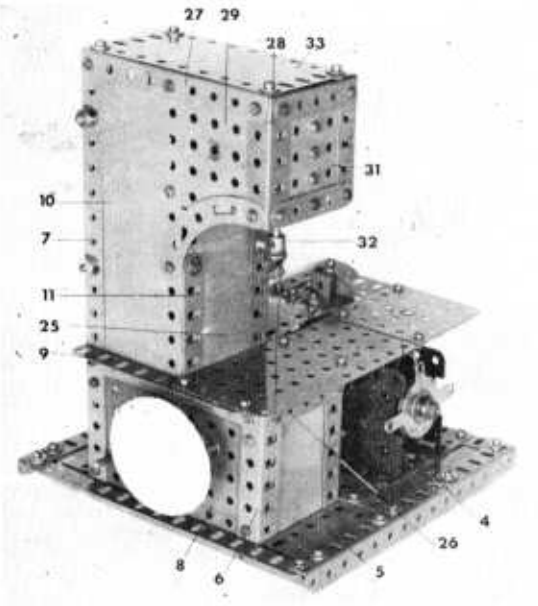
A 36-hour ornate Carriage Clock built by Pat. Briggs of Nottingham, using the same basic movements incorporated in last month's Clock also built by Pat.

In this view of the Carriage Clock, the top has been removed to show the modified escapement shaft and crutch mechanism.



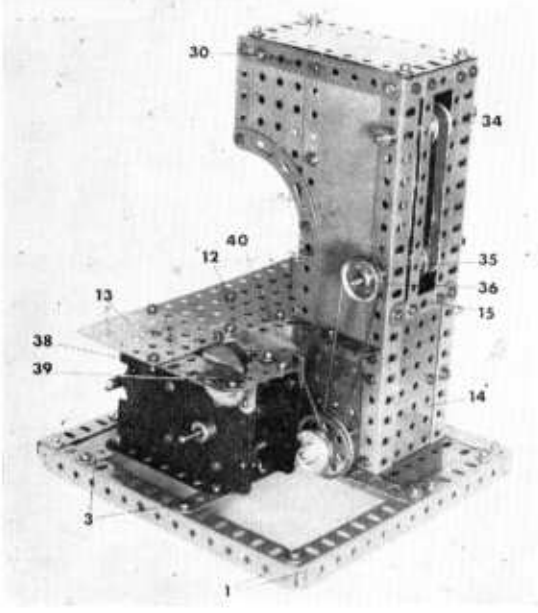
A rear view of Pat. Briggs' Clock in which the lower end of the modified crutch mechanism, incorporating the crutch pins, can be seen.





A WORKSHOP IN ONE

Spanner describes an amazing Meccano Woodworking Machine that actually "works" with real wood



IN MY years with the M.M., I must have seen literally thousands of Meccano models, a high proportion of which have been really excellent affairs. It is only natural that some of these have appealed to my own personal tastes more than others, but I do not think I am any different from most readers in finding working models usually more appealing than static constructions. By working models, of course, I mean models which incorporate the movements or basic principles of a prototype, rather than reproduce the actual work done by a prototype. The former (such as the Punching Machine on page 456 which performs the movements without punching the holes) are quite common, whereas examples of the latter are more difficult to find. In view of this, I was delighted with the Woodworking Machine featured below, not only because it is a full working model—which would have been enough in itself—but also because it is really four models in one!

Yes, four models in one, all of which can be used to some degree in the cutting and shaping of wood! It incorporates a vertically-mounted fret saw, a circular sanding disc, an endless sanding belt and a little circular saw. The first three features work extremely well using a real fret saw blade and proper sand paper, as the case may be, and it is only the circular saw which is perhaps not quite so successful. This is represented by a 50-teeth Gear, a circular saw blade no longer being included in the Meccano system, and so its cutting properties are not particularly good. It does, however, cut to a certain extent—especially balsa wood, which is really the material best suited to the machine as a whole, bearing in mind that it is after all a model. Power for all operations is supplied by an E15R Electric Motor.

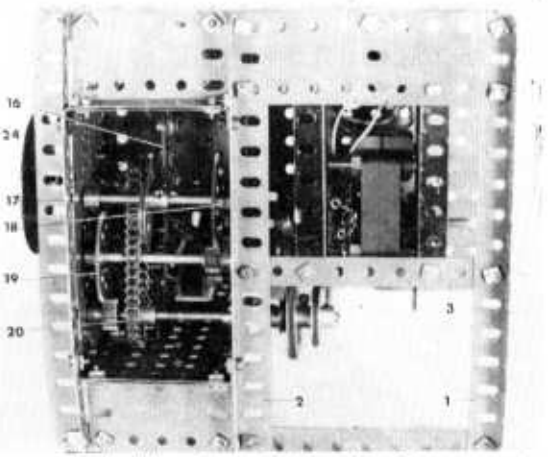
Despite the varied movements of the model it is not by any means a complicated construction. A square base is built up from four 7½ in. Angle Girders 1, two of which are joined through their seventh holes by a further 7½ in. Girder 2. Bolted between this Girder and one Girder 1 are two 4½ in. Strips 3, the securing Bolts holding one of these also helping to fix a 4½ × 1½ in. compound flexible plate 4, obtained from two 2½ × 1½ in. Flexible Plates, in position. Another 2½ × 1½ in. Flexible Plate 5 is bolted to front Girder 1 as shown.

Two similar constructions, each consisting of a 3½ in. Angle Girder 6, and a 9½ in. Angle Girder 7, joined by a 4½ × 2½ in. Flat Plate 8, are now fixed one to the vertical flange of Girder 2 and the other to one Girder 1. In each case, the top of Girder 6 is connected to Girder 7 by a 4½ in. Angle Girder 9, at the same time fixing a 9½ × 2½ in. Strip Plate 10 and a 3½ in. Angle Girder 11 in the positions shown, Girder 11 projecting a distance of one hole below Girder 9. A 5½ × 2½ in. Flat Plate 12, extended by a 2½ × 2½ in. Flat Plate 13, is bolted to the horizontal flanges of Girders 9 in such a way that it extends the full width of the base. A 4½ × 2½ in. Flat Plate 14, overlayed at each end by a 2½ in. Strip 15 is bolted between the lower ends of Girders 7.

Before going any further with the casing, the major part of the operating mechanism should now be fitted. First, however, two Fishplates placed one on top of the other are lock-nutted to one end of two 3½ in. Strips 16, also placed one on top of the other. Lock-nutted through the second holes of these Strips is a Single Throw Eccentric 17, then a fine fretwork blade about 3½ in long is clamped by a Bolt between the Fishplates.

Powered by an E15R Electric Motor, this 4-in-1 Meccano Woodworking Machine can be used to cut and shape balsa wood. Note the "endless" sanding belt.

An underside view of the model showing the drive to fret saw and sanding disc mechanism.



This blade is inserted in one of the holes in Flat Plate 12, the other ends of Strips 16 being lock-nutted to a 1 × 1 in. Angle Bracket bolted to the inside of Plate 14, and the Eccentric is fixed on a 3½ in. Rod held by a Collar and a 60-teeth Gear Wheel 18 in Flat Plates 8. In mesh with Gear 18 is a $\frac{7}{16}$ in. Pinion mounted, along with a 57-teeth Gear Wheel 19, on a second 3½ in. Rod journalled in Plates 8. Gear 19, in turn, meshes with a ½ in. Pinion on a 5 in. Rod mounted in Plates 8 and also carrying a 1 in. Sprocket Wheel 20, a Collar, a ½ in. Pulley 21, a 1½ in. Pulley 22 and a 1 in. Pulley 23, the last three all with bosses and all positioned outside Plates 8. The first three items lie between the Plates with the Collar and the Pinion holding the Rod in place.

Bolted to the outside of one Plate 8 is a Double Bent Strip which, along with the Plate itself, provides the bearings for a 2 in. Rod, on the outside end of which a Face Plate 24 is fixed. Mounted on the inside of the Rod is a Collar, holding the Rod in place, and a ½ in. Sprocket Wheel, connected by Chain to Sprocket Wheel 20.

The rest of the casing can now be finished. A 4½ × 2½ in. Flexible Plate 25, curved outwards at the top, is bolted to Girders 11, while a 3½ × 2½ in. Flexible Plate is bolted between Girders 6 at the front, the securing Bolts also fixing a 2½ in. Strip 26 to the tops of the Girders. Bolted to the top of each Girder 7, at right angles, is a 4½ in. Angle Girder 27, to the end of which a 2½ in. Angle Girder 28 is fixed, also at right angles, with the securing Bolt helping to fix a 2½ × 2½ in. Flat Plate 29 in position, as shown. A Long Threaded Pin 30 with a Collar mounted on its end is fixed to the inside of one Girder 27, then Girders 28 at each side are joined by a further 2½ × 2½ in. Flat Plate 31 edged at the top and bottom by a 2½ in. Strip. Bolted to the inside of this Plate are two 1 × 1 in. Angle Brackets, the end holes in the free lugs of which provide guides for a 2½ in. Rod on which a Collar and an End Bearing 32 are fixed, the Collar being positioned beneath the lug of the upper Angle Bracket. The fret-saw blade is clamped in the End Bearing, then a 2½ in. Driving Band is slipped over Threaded Pin 30 and over a Bolt fixed in the Collar, the latter therefore acting as a stop to prevent the Rod being pulled too far upwards by the elastic action of the Driving Band. A 4½ × 2½ in. Flexible Plate 33 is bolted to the tops of Girders 27.

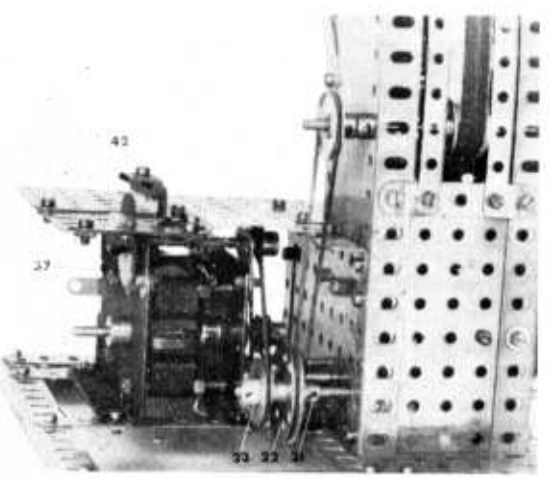
Now journalled in the third holes down of Angle Girders 7 is a 3½ in. Rod held in place by Collars. Mounted in the centre of the Rod are two ¾ in. Flanged Wheels 34 fixed face to face to form a drum. Another two similar Flanged Wheels 35 are mounted on a 4 in. Rod journalled in the ninth holes down of the Girders and held by Collars. A 1 in. Pulley 36 is fixed on the inside end of this Rod, being joined to Pulley 21 by a 6 in. Driving Band. Two 5½ in. Narrow Strips, one each side of the drums, are fixed between Strips 15.

An E15R Motor is next bolted to Strips 3, a ½ in. Pulley on its output shaft being connected by a Driving Band to Pulley 22. Two 1 in. Corner Brackets are then fixed one to each upper rear corner of the Motor sideplates, and in these is journalled a 2½ in. Rod held in place by a ½ in. Pulley with boss and a 50-teeth Gear Wheel 37. This Gear represents the circular saw and is driven by a Driving Band between the ½ in. Pulley and Pulley 23. A work table around the saw is supplied by two 2½ in. Flat Girders 38 joined by a 2 in. Strip 39 and bolted to Flat Plate 13. Inside Flat Girder 38 is connected to Angle Girder 9 by a shaped 2½ × 1½ in. Flexible Plate 40 at the same time fixing a ½ × ½ in. Reversed Angle Bracket in position. Bolted to the free lug of this, but spaced from it by two Washers on the shank of the securing Bolt is a curved 1½ in. Strip 41 serving as a guard for the saw blade.

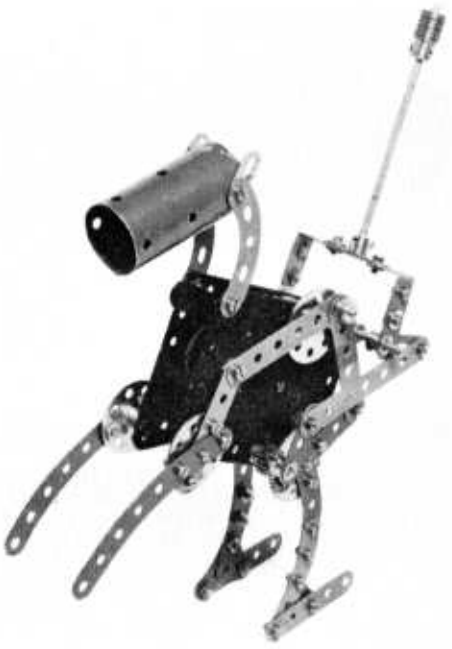
So far, then, we have the model built and the saw attachments completed. All that remains to be finished are the sanding attachments and these present no great problem. In one case, a circular disc 2 in. in diameter is cut out of 1 piece of sandpaper and stuck onto Face Plate 24 with a suitable adhesive such as Bostik 1 or Evostik. In the other case, a strip of emery paper ¾ in. wide and 8¾ in. long is passed round Flanged Wheels 34 and 35, and the ends joined to form an "endless" belt. Ideally, the ends should not overlap, but should be "butt-jointed" using a strip of adhsive tape stuck to the back of the emery paper across the join.

In operation, the model is tremendously impressive, but I must stress that it *is* a model so don't expect *too* much from it.

See page 455 for Parts List.



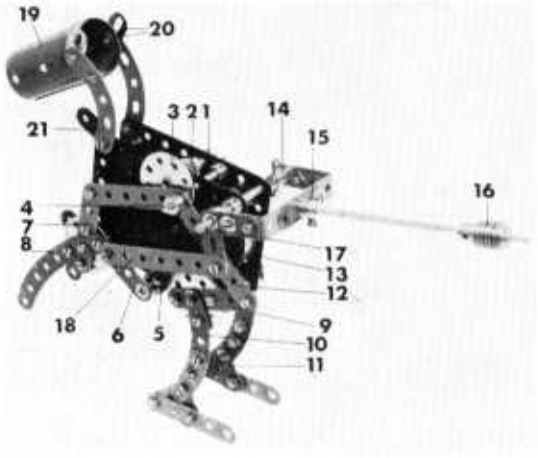
A close-up view of the Motor mounting and initial drives to the various operating features.



COME STEEPLECHASING

. . . with this fun-packed Meccano Model described as a "Steeplechaser" by its builder, D. J. Turnham of Old Marston, Oxford

Above, laughs galore can be had with this Meccano "Steeplechaser" designed and built by D. J. Turnham of Old Marston, Oxford! Below, another view of the "Steeplechaser" showing almost its entire construction. This is an outstanding model considering its performance in relation to its simplicity.



GENERALLY SPEAKING Meccano is regarded as a fully-fledged miniature engineering system. This is as it should be, but it does not mean that Meccano must *only* be used for the reproduction of genuine engineering structures. On the contrary, the system can be, and often is, used to make more light-hearted models such as the steeplechaser featured in this article. (You will see from the accompanying photographs that the model does look something like a horse and, as it performs two movements—a "prance" followed by a "step"—the title "Steeplechaser" seemed particularly appropriate to me!—Spanner.)

So as to keep the quantity of parts used in the model as low as possible, the horse was built round a No. 1 Clockwork Motor, the Motor thus not only providing the power for the movements, but also serving as the major part of the horse's body. Before actual construction is begun, however, the drive pinion is removed from the Motor which is then wound. A 1½ in. Rod 1 is mounted in the Motor sideplates, six holes from the brake lever, where it is held in place by Collars positioned one each side of one of the plates. The inner Collar acts as a retainer to limit the expansion of the Motor mainspring thus preventing it from fouling a ½ in. Pinion 2 mounted on a 1½ in. Rod, held in the sideplates by a Collar and an 8-hole Bush Wheel 3. A Threaded Pin 4 is fixed to this Bush Wheel as shown, while the Pinion engages with the main drive gear wheel of the Motor. Held by a Collar in the opposite edges of the sideplates, in line with the above 1½ in. Rod, is a 2 in. Rod on which a ½ in. Pinion 5 and a Crank 6 are securely fixed.

Turning to the left foreleg, a 2½ in. Strip 7 is bolted across an 8-hole Bush Wheel, a spacing Washer being mounted on each securing Bolt. Fixed by ½ in. Bolts to this assembly, as illustrated, is a 4 in. Stepped Curved Strip 8, a Nut on each Bolt being used as a spacer, in this case. The right foreleg is similarly built, except that Strip 7 is omitted, then both legs are mounted tight on a 2 in. Rod journalled in the corner holes in the Motor sideplates. The Rod, of course, is passed through the bosses of the Bush Wheels. One end of a 3 in. Strip is lock-nutted to Strip 7, the other end being slipped onto Threaded Pin 4.

In the case of the left hindleg, a 2½ in. Strip 9 is bolted across a 57-teeth Gear as also is a 2½ in. Curved Strip 10, the latter, at right-angles to the former, running only to the centre of the Gear and being spaced from it by a Washer. Curved Strip 10 is extended three holes by a similar Curved Strip to which a 2½ in. Strip 11 is bolted, the joint being strengthened by a 1 in. Corner Bracket. In the right hindleg, Strip 8 is omitted and an 8-hole Bush Wheel is substituted for the 57-teeth Gear, but otherwise construction is similar. Both legs are mounted on a 2 in. Rod, journalled in the Motor sideplates, with the 57-teeth Gear engaging Pinion 5. A 3 in. Strip 12 is lock-nutted, at one end, to Strip 9, the other end being slipped onto Threaded Pin 4 where it is held in place by a Collar.

The tail unit acts as a counterbalance and is built up from a Bell Crank 13 connected to an ordinary Crank 14 by a 2½ × 1 in. Double Angle Strip. Bolted

PARTS REQUIRED

1—3	2—18a	5—38	4—90
2—4	1—19a	1—46	2—90a
4—5	4—24	7—59	2—111c
2—10	2—26	2—62	1—115
1—16	1—27a	1—62b	1—128
3—17	1—32	2—89b	2—133a
	No. 1 Clockwork Motor		1—216

to this Double Angle Strip is a Double Arm Crank 15, in the boss of which a 5 in. Rod is fixed. A Worm 16 is mounted on this Rod. Cranks 13 and 14 are now secured on a 3½ in. Rod 17 held by Collars in the upper rear corner holes of the Motor sideplates. To obtain balance, it is important that an equal length of surplus Rod should project through the bosses of the Cranks at each side. A 3½ in. Strip 18 is lock-nutted between Bell Crank 13 and Crank 6, as shown, the end of Rod 17 serving as a stop for the Strip.

Finally, the head is very easily built from a Cylinder 19 to which two Fishplates 20 and two 2½ in. Stepped Curved Strips 21 are bolted, the former to represent the ears and the latter, the neck, being fixed tight to the upper front corners of the Motor sideplates.

With the model completed it is " trimmed " by first ensuring that the forelegs are in alignment and that it stands firmly on its balancing feet in the " prance " position. Crank 6, the angle of the neck and the position of Worm 16 on its Rod are then adjusted until the model performs a " prance " successfully without falling over backwards. It is advisable to fit two Grub Screws in the boss of the Gear and each Bush Wheel used in the legs.

The movements of the horse are mainly dependent on the action of the tail counterbalance on Pinion 5. When the tail is horizontal, the Pinion climbs around the 57-teeth Gear simulating a prance, but when it is vertical, a step is made.

PARTS REQUIRED—A WORKSHOP IN ONE

2—2a	3—16	103—37b	1—111c
2—3	2—16a	36—38	1—115a
7—5	1—17	1—45	1—125
1—6	4—20b	3—53a	1—130a
2—8a	1—21	9—59	2—133a
5—8b	1—22	1—70	1—166
4—9a	3—23a	4—72	2—186
4—9b	1—26	2—89a	2—186a
2—9d	1—26c	1—94	5—188
2—10	1—27	1—96	1—190a
2—12a	1—27a	1—96a	1—191
1—15	1—27d	2—103f	2—195
1—15b	107—37a	1—109	2—235f

1 E15R Motor

" Good afternoon gentlemen, here is the shipping forecast for today Saturday the . . . "

Mechanical Engineer

Training in the Fleet Air Arm

Continued from page 425

Mechanical Engineering. The fourth year is spent on Front Line service at Naval Air Stations for field experience and the fifth back again at H.M.S. Condor. The fifth year being devoted almost entirely to technical training, and at the end of this course, Aircraft Artificers —as they then are—have a thorough training behind them in both the practical and theoretical skills needed, which is recognised by the T.U.C. as being equivalent to civilian apprenticeships. During the fourth and fifth years, entrants can sit for their Higher National Certificate, studying in their own time, but most Artificers prefer to leave this until they have reached the rank of Petty Officer.

The training given to Artificer Apprentices is to say the least, very expensive and because of this the Navy have to ensure that they do get a minimum of return on their investment. The minimum signing-on period is 12 years, man's time, running from the age of 18. At the age of 30, which is the first available time for leaving the service, a further 10 years can be signed on for to give release at the age of 40—after 22 years service—which is then pensionable.

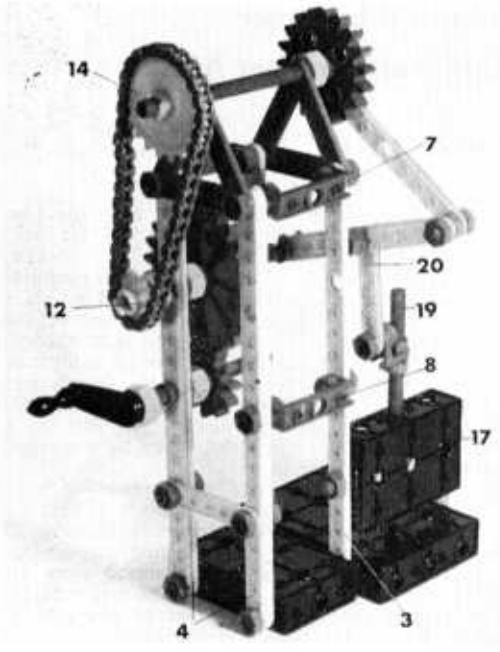
When one considers the rate of pay, at first it would seem a little low, but on subsequent inspection bearing in mind that one is paid 7 days a week and accommodation and food, etc., are provided, they are comparable to civilian pay. First year Artificer Apprentices earn 9/- a day, fourth year Artificer Apprentices earn 22/3d. a day, Leading Hands earn 37/9d. a day, whilst Petty Officers earn 48/9d. a day.

Whilst at H.M.S. Condor the Editor was very impressed by the accent placed on leadership training. In addition to the parade ground work and leadership lectures, extensive facilities are conveniently available in the local area for venture training which includes camping, canoeing, hill walking and sailing. During an air trip in the Sea Prince aircraft, piloted by Lt. Cdr. S. C. Farquhar, which is held on the station for practical aerodynamic instruction and for giving trainees air experience, we spotted several groups on venture training in the snow covered Scottish hills. This flight really was something to be remembered, as your Ed. sat in the Navigator's seat at the side of the pilot, flying low over the snow covered Scottish hills, in brilliant sunlight, with the red Naval tents standing out vividly against the white background.

A real surprise was in store on landing, as Lt. Cdr. Farquhar decided to test the station's alertness. He landed short on the main runway, and called the tower up to say the aircraft had crashed, to test reactions of the fire, ambulance and rescue crews. Within seconds your Ed. was being dragged from his seat by an asbestos-clad, hatchet wielding, rescue crew member. Quite an experience, and reassuring to know that these chaps are on the ball, all the time.

Modellers in Scotland will be pleased to note that *H.M.S. Condor* has an Open Day on July 20th, which will feature both flying and static aircraft displays.

We would like to thank Captain J. W. Mott M.V.O., Commanding Officer of *H.M.S. Condor* and his fellow officers for their kind hospitality and co-operation which enabled this feature to be produced.



Built with Plastic Meccano Set C plus one additional 1 in. Bolt, this model Punching Machine illustrates the simple principles behind equipment of this type.

PLASTIC PUNCHING MACHINE by Spanner

An interesting working model built with Plastic Meccano Set C, plus one extra 1 in. Bolt.

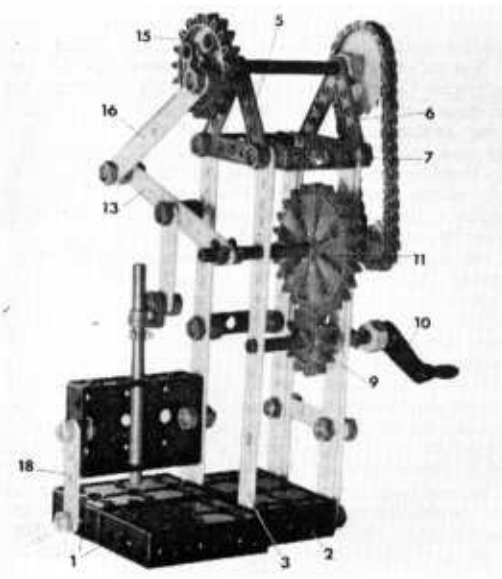
LOOKING AT the Instructions Leaflet packed with the Plastic Meccano Outfits it struck me that the great majority of models featured in it were based on vehicles, aircraft or engineering structures such as bridges, cranes, windmills, etc. Rather surprisingly, no engineering machines are included and, as it is perfectly possible to produce machine models with Plastic Meccano, we thought that the situation should be remedied. Our model-builder has therefore come up with the " working " Punching Machine described below. (I use " working," here, not because the model actually punches holes—it doesn't—but because it reproduces the operations of a punching machine so that you can see the simple principles behind this type of equipment.)

The model can be built from Plastic Meccano Set C with the addition of one extra 1 in. Bolt, and even this could be done without at a pinch. Like most Plastic Meccano models, construction is not difficult. Two Bases 1 are joined together then to one end of these a third Base 2 is bolted at the same time fixing two 5-hole Strips 3 between the Bases, as shown. Bolted to the outside of Base 2 are a further two pairs of 5-hole Strips 4, each pair consisting of two Strips mounted one on top of the other. Strips 3 are joined at the top by a 2-hole Triangular Girder 5, another similar Triangular Girder 6 joining Strips 4. In addition Strips 4 are joined through their second holes up by a 2-hole Strip, then both Strips 3 are connected to Strips 4 by two Double Angle Strips 7 at the top, while a further Double Angle Strip 8 is bolted between the centres of one Strip 3 and corresponding Strips 4.

Now journalled in the centre holes of remaining Strips 3 and 4 is a 4½ in. Axle, held in place by an Axle Clip and a 12-teeth Gear Wheel 9, a Handle 10 also being fixed on the end of the Rod. Gear 9 engages with a 24-teeth Gear Wheel 11 fixed on a 6 in. Axle also secured by an Axle Clip in Strips 3 and 4. Mounted on one end of the Axle is a 10-teeth Sprocket Wheel 12, while held on the other end by Axle Clips is a 3-hole Strip 13. Journalled in the apex holes of Triangular Girders 5 and 6 is a second 6 in. Axle on one end of which a 20-teeth Sprocket Wheel 14 is fixed, the other end carrying an 18-teeth Gear Wheel 15. Sprocket 14 is connected to Sprocket 12 by Chain, while a 3-hole Strip 16 is lock-nutted between Gear 15 and the free end of Strip 13.

At this stage a fourth Base 17 is bolted to one Strip 3, also being attached to one Base 1 by a 2-hole Strip 18, as illustrated. The centre holes in the sides of this Base serve as guides for a 6 in. Axle 19 on which an Angle Bracket is held by Axle Clips. Pivotally connected to the vertical lug of this Angle Bracket is a 2-hole Strip 20 the upper end of which is lock-nutted to the centre of Strip 13.

If everything has been correctly built, Axle 19 representing the punch, should move up and down when the cranking Handle is turned.



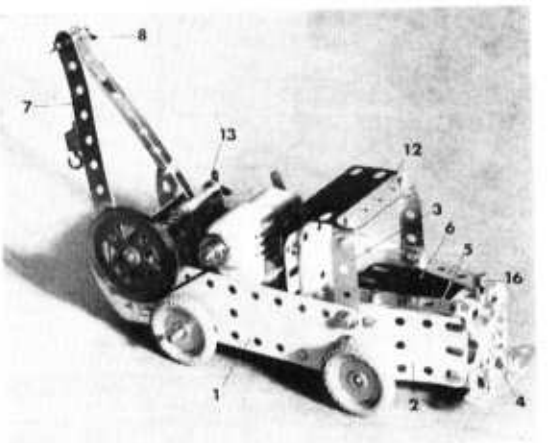
PARTS REQUIRED

3—2-hole Strips	1—4½ in. Axle
2—3-hole Strips	2—2-hole Triangular Girders
6—5-hole Strips	3—6 in. Axles
4—Bases	1—Handle
15—Bolts	1—24-teeth Gear Wheel
5—1 in. Bolts	1—18-teeth Gear Wheel
23—Nuts	1—12-teeth Gear Wheel
1—Angle Bracket	1—20-teeth Sprocket Wheel
3—Double Angle Strips	1—10-teeth Sprocket Wheel
6—Axle Clips	41—Chain Links

BREAKDOWN TRUCK

by Spanner

An interesting little model built with the Meccano Junior Power Drive Set, or Meccano Outfit No. 2. The winch is driven by the new Junior Power Drive Unit.



FOLLOWING THE tremendous success of the Power Drive Set over the past two years, Meccano introduced a smaller motorised outfit, the Junior Power Drive Set, shortly before last Christmas. The Junior Power Drive Unit (consisting of a 4½ volt reversible D.C. motor coupled to a fixed-ratio gear mechanism) contained in the Set has itself created considerable interest—so much so, in fact, that it is intended to market the Unit separately as is done with the larger Power Drive Unit. Featured below, therefore, is a simple Breakdown Truck which can not only be built with the Junior Power Drive Set, but which, in view of the separate availability of the J.P.D.U., can also be built with the No. 2 Standard Outfit plus one ½ in. Pulley to fix on the output shaft of the Unit to drive the winch.

Each side of the model is similarly built from a 5½ × 1½ in. Flexible Plate 1 extended four holes by a shaped 2½ × 1½ in. Flexible Plate 2, at the same time fixing a 2½ in. Strip 3 in position as shown. At the lower front corner, Plate 2 is attached by an Angle Bracket to a Trunnion 4, the securing Bolt passing through one of the open areas of the Trunnion. Because of this, a Washer is mounted on the Bolt so as to hold the Trunnion in place. A second, inverted Trunnion is then bolted to the apex of Trunnion 4 and to this are fixed two 2½ in. Strips 5, the securing Bolts also holding a 2½ × 1½ in. Plastic Plate 6 in place. Each Strip is attached to corresponding Plate 2 by an Angle Bracket while another 2½ in. Strip is bolted to the horizontal flange of Trunnion 4.

Strips 3 are now joined by a 2½ × ½ in. Double Angle Strip, while another similar Double Angle Strip is bolted between the upper rear corners of Plate 1, the securing Bolts also fixing a 5½ in. Strip 7 in place at each side. These Strips are curved inwards and shaped until a 1 in. Rod 8 can be held by Spring Clips in their end holes, then each is braced by a 2½ in. Stepped Curved Strip bolted to the lower corner of Plate 1.

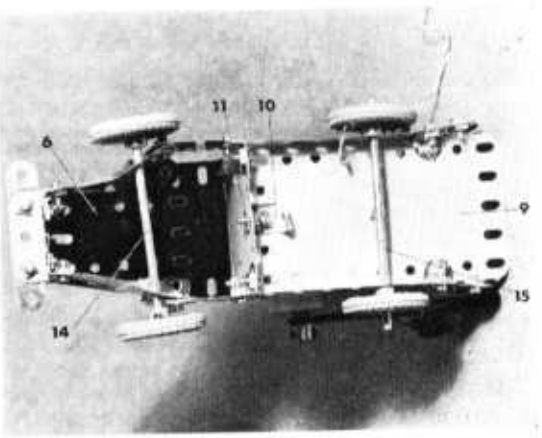
The bed of the truck consists simply of a 4½ × 2½ in. Flexible Plate 9 attached to Plates 1 by Angle Brackets. Fixed by a Double Bracket across the inside end of this Plate is a 2½ × 2½ in. Flexible Plate 10 extended by a 2½ × 2½ in. Plastic Plate 11, the latter curved over and bolted, along with a 2½ in. Strip 12, to the Double Angle Strip joining Strips 3.

A 3½ in. Rod 13, journalled in Fishplates bolted to Plates 1, acts as the winch. The Rod carries a length of Cord attached to a Cord Anchoring Spring and is held in place by a Spring Clip and a 2 in. Pulley. This Pulley is connected by a Driving Band to a ½ in. Pulley on the output shaft of the Junior Power Drive Unit which is fixed as shown to Plate 9. The wheels are supplied by 1 in. Pulleys with Motor Tyres, those at the front being mounted on a 3½ in. Rod 14 and those at the rear on a 4 in. compound rod 15 obtained from two 2 in. Rods joined by a Rod Connector. Finally, a Rod and Strip Connector 16 is bolted to the radiator-grille, to add some embellishment, and a hook is tied to the end of the winch Cord.

PARTS REQUIRED

2—2	1—20a	2—48a	2—188
6—5	4—22	1—69	2—189
2—10	1—23a	5—69a	1—190
1—11	3—35	2—90a	1—191
8—12	38—37a	2—126	1—194
2—16	38—37b	4—142c	1—194a
2—17	10—38	1—176	1—212
1—18b	1—40	1—186a	1—213

1—Small Hook



Above, built with the Meccano Junior Power Drive Set, this little Breakdown Truck incorporates a winch driven by the new Junior Power Drive Unit. At right, an underside view of the model showing its simple construction. Note the built-up rear axle.