

# STRIP-ROLLING MACHINE

A practical unit designed by "MECCANOMAN"

In Meccano modelling, it is at times required to curve Strips to an even radius. When this is attempted by hand, uneven results stem from the tendency for the Strip to bend in a series of kinks at each hole. It is also very difficult to maintain the curve smoothly to the extreme ends of the Strip.

The Strip Rolling Machine described here has been designed to have its rollers mounted as close as practicable so as to ensure smooth curving of the Strip between its holes. The choice of  $\frac{1}{2}$ " centres allows all three rollers to be driven together through a chain of  $\frac{1}{2}$ " Pinions which ensure smooth passage of a Strip through the rollers with the minimum of slip; it will even be found that painted Strips can be curved to quite an extent with minimal damage to the paint. However, in all cases where sharp radii are required, the Strip concerned should be curved in a succession of operations of gradually increasing severity.

The machine is also equally efficient in straightening the Strips after they have fulfilled their function. In addition, mutilated Strips can very often be restored by curving them gently first one way and then the other, thus gradually reducing the damage until straightness is achieved once more.

## CONSTRUCTION

### THE ROLLERS

Construction is commenced with the top roller assembly which consists of a  $3\frac{1}{2}$ " Rod with a centrally-mounted Short Coupling, on either side of which are placed, in order: a  $\frac{3}{4}$ " Washer, a  $\frac{3}{8}$ " Washer, two Couplings by their end transverse holes; then a further  $\frac{3}{8}$ " Washer, and finally a  $\frac{1}{2}$ " Pinion, boss inwards.

The lead-in roller assembly is formed of a further  $3\frac{1}{2}$ " Rod which passes through the other end transverse bores of the inner pair of Couplings mentioned above. This also carries a centrally-mounted Short Coupling, and  $\frac{1}{2}$ " Pinions, boss inwards on both ends.

The feed-out roller assembly is a 4" Rod, this time through the end transverse holes of the outer pair of Couplings, with a central Short Coupling as before. On one end is a  $\frac{1}{2}$ " Pinion, boss inwards, with one spacing Washer. On the other end, the additional  $\frac{1}{2}$ " length allows the

relevant end  $\frac{1}{2}$ " Pinion to be mounted boss outwards. The boss of this  $\frac{1}{2}$ " Pinion is then inserted into one recess of a Socket Coupling, whose other recess carries the boss of a Spoked Wheel, which acts as actuating handwheel. All tapped holes in both Pinions and Short Couplings are fitted with Grub Screws, those in the Short Couplings must be 3mm [69c] to ensure an unobstructed rolling surface.

### THE OPERATING LEVERS

The four operating levers are formed of  $3\frac{1}{2}$ " Crank Handles, which must be carefully selected to be identical in length, and in the profile of their bends. The use of these Crank Handles ensures that a full range of roller positions can be achieved without fouling the  $3\frac{1}{2}$ " Rods.

The lower ends of the outer Crank Handles are mounted in the bases of Handrail Couplings whose transverse bores rotate freely on  $1\frac{1}{2}$ " Rods which form part of the base frame assembly. These Rods are connected by Couplings at their inner ends, and carry vertical Couplings at their outer ends to act as leg supports. Collars are fitted against the inner faces of the Handrail Couplings for location purposes.

### THE BASE

The other end of the base frame assembly is similar, but carries no Handrail Couplings or Collars. The sides of the frame are 8" Rods located in the central transverse bores of the vertical Couplings. The legs themselves are  $1\frac{1}{2}$ " Axle Rods, which carry 1" Pulleys and Tyres as feet.

### ADJUSTMENT

The setting of the roller angle is determined by a special assembly mounted on an 8" Screwed Rod, which consists of a Coupling mounted by its central transverse threaded bore. This has 1" Rods protruding from its ends which carry the eyes of two Handrail Couplings, which in turn are retained by Collars. These Handrail Couplings are of course mounted on the lower ends of the inner pair of Crank Handles. Turning of the 8" Screwed Rod thus allows a fine adjustment of the roller angles. This Threaded Rod carries a lock-nutted Adaptor for Screwed Rod whose pin turns freely in the central transverse bore of the horizontal Coupling at one end of the base.

At the other end of the base, the Screwed Rod itself turns in the equivalent

bore of the Coupling at that end. The operating handle is a Threaded Crank fitted with a long Threaded Pin as shown, and is lock-nutted to the end of the Screwed Rod. Endplay is controlled to close limits with a Threaded Boss, which is also lock-nutted.

A few examples of work done by the machine are shown. It will be seen that various lengths of Strips can readily be rolled into complete circles. The laminated spring, produced with the aid of the machine, is interesting, as it seems to have acquired additional resilience in the process; it will return to the camber shown even after being deflected until 'flat'. In passing, I should mention that its buckle is a Short Circuit Piece [Electrical Part 554]; the various leaves are kept in alignment by a long Grub Screw through the centre holes of the leaves, which is retained in place by the buckle.

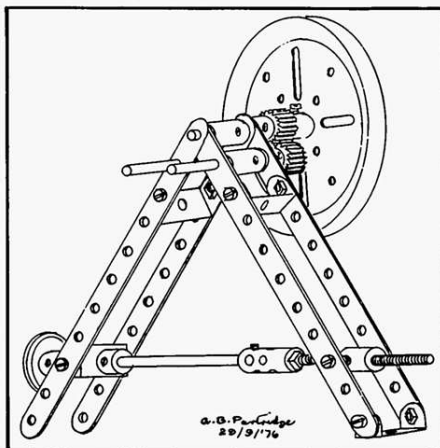
### PARTS REQUIRED

2	13a	6	26	1	64
1	15b	3	37c	1	69c
2	16	5	38	1	79
8	18a	2	38d	1	115a
2	18b	4	59	4	136a
1	19a	1	62a	4	142c
4	19s	11	63	1	171
4	22	3	63d	1	173a

### AN 'ECONOMY VERSION' by ALAN PARTRIDGE

This device is closely based on the foregoing machine which I have found so useful. My version contains the minimum of expensive brass parts, but is not so robust as 'Meccanoman's'.

The construction should be clear from the diagram after reading the description of the 'Rolls-Royce' version.



# AMONG THE MODEL BUILDERS

with Spanner

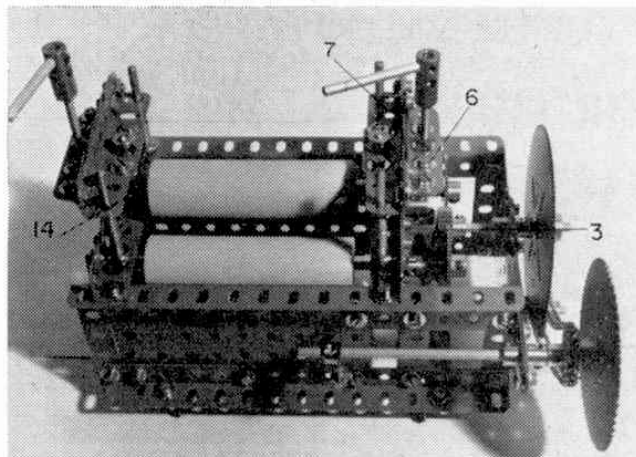
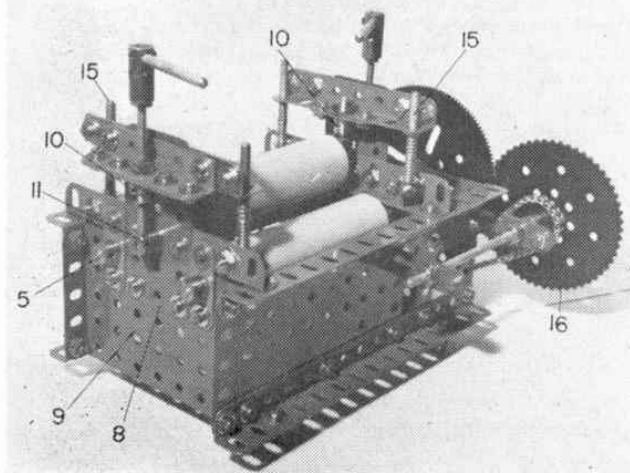
THE INTERNATIONAL appeal of Meccano has often been stressed in these pages—so much so, in fact, that some readers are beginning to wonder if I spend my spare time writing copy for advertisements! I assure you I don't, but I make no apology for frequently mentioning the world-wide interest in Meccano, simply because interest in Meccano is world-wide. We often hear of enthusiasts outside the U.K. and, in fact, our first offering this month was designed by one such enthusiast—Mr. Ulysse Bachelard of Zurich, Switzerland.

Ulysse has been building models for something like 40 years and I understand that it has been one of his burning ambitions for some time to have something he has designed appear in print. In the past he has been quite unable to attain this ambition as he neither writes nor speaks English, but, on this occasion, he has overcome the problem by sending a photograph of one of his creations to Mr. Bert Love, Secretary of the Midlands Meccano Guild. The model in question was a Flexible Plate Bending Machine which makes an extremely useful tool for a Meccano workshop. Bert Love built a copy of it from the illustration and, with Ulysse's permission, he has written the following description as well as supplying the accompanying photographs.

"The general construction of the framework," says Bert, "is evident from the three accompanying illustrations and consists of four  $7\frac{1}{2}$  in. Angle Girders spaced by three  $3\frac{1}{2} \times 2\frac{1}{2}$  in. Flanged Plates. It will be noted that all bearings for Axle Rods are reinforced by Double Arm Cranks to ensure very smooth and positive motion of the bending rollers. A double thickness of  $1\frac{1}{2}$  in. Perforated Strips may be substituted for the Cranks if the machine is used on a short term basis.

One of the accompanying pictures shows the reduction drive to the lower pair of rollers, both of which

In this end view of Mr. Bachelard's Machine, construction of the slides for the upper roller is clearly shown.

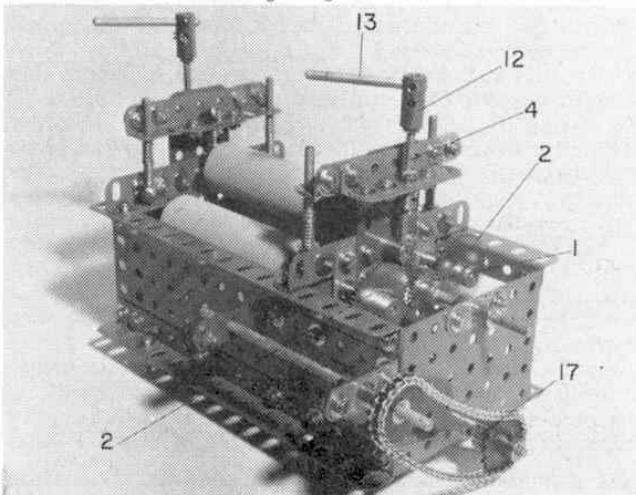


Built for Meccano Magazine by Mr. Bert Love of Birmingham, this Flexible Plate Bending Machine was originally designed by Ulysse Bachelard of Zurich, Switzerland—a Meccano modeller with some 40 years of model building experience behind him.

rotate in the same direction at the same speed. The  $\frac{3}{4}$  in. Pinion 1 which drives the two 50-teeth Gear Wheels 2 is mounted on a  $2\frac{1}{2}$  in. Axle Rod the latter so positioned that only a very small part of it projects through Double Bent Strip 3. This allows clearance for the Screwed Rod 4, used for applying pressure to the top roller, which, like the other two rollers used in the machine, is a standard Meccano Wood Roller covered with a fine grade of sandpaper. This is glued to the Rollers with a few spots of suitable adhesive, the sandpaper being cut carefully to make a neat butt joint and held in place with rubber bands until the glue sets. The lower rollers are carried on  $6\frac{1}{2}$  in. Rods 5 kept in place by an inside Collar and a Compression Spring between the face of each 50-teeth Gear Wheel 2 and its adjacent Double Arm Crank. This helps to keep a smooth tension and motion on the Roller shafts and the Springs also act as convenient "Spacers".

Construction of the slides on which the top roller is carried is clearly shown in another photograph. Each slide consists of a  $2\frac{1}{2}$  in. Angle Girder 6 bolted to a  $3\frac{1}{2}$  in. Angle Girder 7, but spaced from it by a double thickness of Fishplates as shown. This allows the slide to pass freely over the "guide" which is obtained from a  $3 \times 1\frac{1}{2}$  in. Flat Plate 8 bolted to the Flanged Plate 9 at each end of the Rollers. Both

In this view of the Plate Bending Machine, the built-up crank handle and  $3\frac{1}{2}$  in. Gear have been removed to show the reduction gearing to the rollers.





A simple Differential mechanism designed by James Grady of Dundee for use with small models possibly using 1 in. Pulleys with Motor Tyres as road wheels.

Girders forming each slide carry Double Arm Cranks 10 at their centres, bosses pointing downwards. The boss of the outside Crank provides a journal for one of the 3 in. Screwed Rods 4 used for applying pressure to the top roller. The lower end of each Screwed Rod is inserted into the transverse tapped bore of a Rod Socket 11 as shown. Two lock-nuts are secured about half-way down each Screwed Rod where they bear against a Washer acting as a pressure point applied to the outside of the slide. At their upper ends the Screwed Rods are secured by a lock-nut in the tapped bores of Threaded Couplings 12 in which a 2 in. Rod 13 is fixed to provide a lever.

Loose in the boss of each Crank fixed to the inside Girders of the slides is a 1 in. Rod to the lower end of which a Short Coupling 14 is attached to act as one of the bearings for the top roller. A Collar is fixed on the top of the Rod. Additional guides for the slides are provided by four vertical 2 in. Rods 15 mounted in Handrail Supports. Each of these Rods is fitted with two Compression Springs and Washers to raise the top roller when the pressure screws are released.

The machine is hand driven by a special crank consisting of a 3 in. Sprocket Wheel 16 to which a Long Threaded Pin is fixed. A pair of 1 in. Sprocket Wheels and Chain carry the drive to a  $\frac{1}{2}$  in. Pinion 17, as shown, this Pinion meshing with a  $3\frac{1}{2}$  in. Gear Wheel mounted on the  $2\frac{1}{2}$  in. Rod carrying the Pinion 1.

With this useful machine, Meccano Flexible Plates may be bent to a curvature as small as  $1\frac{1}{2}$  in. radius with perfect results. To operate it, a Flexible Plate is placed between the top and the two bottom rollers. Slight pressure from the Screwed Rods is applied and the Plate is rolled backwards and forwards while pressure is continuously applied. Inserting a Plate at an angle will produce a spiral bend, such as used on helter skelters or bus staircases."

#### PARTS REQUIRED

2-5	1-16a	1-44	2-80c
4-8b	6-17	1-47a	1-94
4-9a	2-18b	3-53	1-95b
2-9b	1-25	2-53a	2-96
2-9d	1-26	6-59	3-106
8-10	2-27	11-62b	1-115a
2-14	1-27b	2-63c	10-120b
1-15	80-37	2-63d	4-136
1-16	*186-38	2-73	2-179

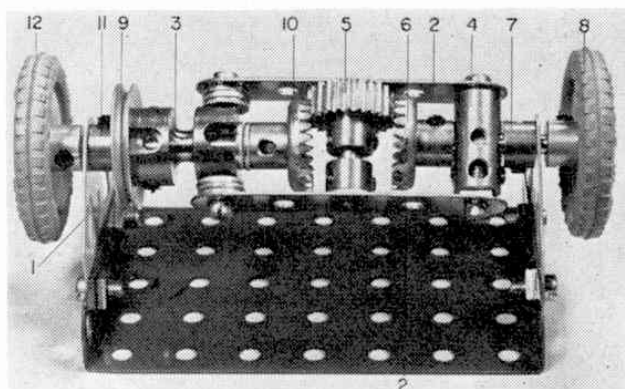
Half a sheet of fine grade sand paper.

\* If washers on Nuts and Bolts are omitted, quantity of Part No. 38 is reduced to 26.

#### Small Differential

Moving onto a different subject, on two separate occasions during the past year we have featured an extremely interesting mechanism designed by James Grady of Dundee, Scotland. In each case the particular mechanism featured was purposely small in size so that it could be used with small models—especially those using 1 in. Pulleys with Motor Tyres as road wheels. We have already had a Front Wheel Drive system and 4-wheel Independent Suspension from Mr. Grady. Now we have a small Differential Mechanism from the same source, this also being designed for use with 1 in. Pulleys with Motor Tyres.

Construction is not difficult, as the accompanying illustration shows. The mounting will of course vary with the model in which the mechanism is to be incorporated, but, in our example, it consists of a



#### PARTS REQUIRED

2-5	3-22	5-37b	1-63c
1-17	1-25	9-38	3-111c
1-18a	2-29	1-53	2-126a
1-18b	5-37a	3-59	2-142c
			1-171

$3\frac{1}{2} \times 2\frac{1}{2}$  in. Flanged Plate, to each side flange of which a Flat Trunnion 1 is bolted. The apex holes in these Flat Trunnions will later serve as the bearings for the main axle Rods, but first two  $2\frac{1}{2}$  in. Strips 2 are secured to a Socket Coupling 3 by  $\frac{3}{8}$  in. Bolts screwed into the threaded bores at one end of the Socket Coupling, each Strip being spaced from the Coupling by three Washers on the shank of the securing Bolt. At their other ends, Strips 2 are fixed to a Threaded Coupling 4, one by a Bolt screwed into the threaded bore of the Coupling and the other by a  $\frac{3}{8}$  in. Bolt held by two Grub Screws in the opposite end of the Coupling. A Nut on the shank of this Bolt acts as a spacer. Journalled in the centre holes of Strips 2 is a 1 in. Rod carrying a  $\frac{3}{4}$  in. Pinion 5 and held in place by a Collar.

Mounted free in the centre transverse bore of Threaded Coupling 4 and in nearby Flat Trunnion 1 is a  $1\frac{1}{2}$  in. Rod on which are fixed a  $\frac{3}{4}$  in. Contrate Wheel 6, a Collar 7 and a 1 in. Pulley with Motor Tyre 8. Contrate 6 is in constant mesh with Pinion 5.

A 1 in. Pulley with boss 9 is now fixed in the outside end of Socket Coupling 3. Journalled free in this and in the Socket Coupling, as well as in appropriate Flat Trunnion 1, is a 2 in. Rod carrying a second  $\frac{3}{4}$  in. Contrate Wheel 10, spaced from the Socket Coupling by two Washers, a Collar 11 and another 1 in. Pulley with Motor Tyre 12. Contrate 10 also meshes with Pinion 5. Pulleys with Tyres 8 and 12 act as the road wheels, while the drive, in this case supplied by a Driving Band, would be taken to Pulley 9. This Pulley, by the way, could be replaced by another part such as a Sprocket Wheel, if required.

I would like to close this month by drawing your attention to the illustrations on page 162. They show the work of two really keen Meccano enthusiasts, one in this country and the other across the far side of the world, in Australia. Neither of these gentlemen, Mr. D. G. Higginson of Stevenage, Herts., here, and Mr. W. R. Inglis of South Blackburn, Victoria in Australia, court anonymity. On the contrary they are both very active in making the public aware of Meccano and showing the "uninitiated" something of what can be done with the system—and this in the best way possible, by exhibiting well-built and detailed models. The photographs, in fact, show Mr. Higginson and Mr. Inglis with their models on show, the former at a recent exhibition he gave in a Stevenage school,

*Continued on page 162*

to twist two separate lengths of flexible wire together quickly and neatly so that they form a duplex cable.

The base of the machine consists of two  $5\frac{1}{2}" \times 2\frac{1}{2}"$  Flanged Plates connected together by a pair of  $12\frac{1}{2}"$  Angle Girders, and a second pair of Angle Girders are attached by means of Angle Brackets so as to form channels in which the  $3\frac{1}{2}" \times 2\frac{1}{2}"$  Flanged Plate 3 may slide. Two  $3\frac{1}{2}" \times 2\frac{1}{2}"$  Flanged Plates are bolted in an upright position to one of the  $5\frac{1}{2}" \times 2\frac{1}{2}"$  Flanged Plates and two  $4\frac{1}{2}"$  Rods 2 are placed as shown so that they can slide longitudinally. A Collar is mounted on the end of each of the Rods 2 and a  $1\frac{1}{2}"$  Strip held in place between the Collars by means of Threaded Pins, which are secured in the threaded bores of the Collars. At the left-hand end of the machine, a Crank Handle fitted with an End Bearing and Hook 1 is journaled in two Double Angle Strips.

In order to prepare a piece of twin flex, the two wires should first of all be rigidly secured to the Hook 1 and then passed on either side of the Axle Rod mounted on the Plate 3 and finally secured to the Threaded Pins fitted to the ends of the Rods 2. The Plate 3 with the Axle Rod attached should be pushed up close to the Hook 1 and the Crank Handle then turned so as to twist the wires together. As the twisting operation proceeds, the Rod attached to the Plate 3 will be pushed ahead of the flex while the shortening of the wires through twisting will cause the Rods 2 to slide forward against the tension of a Spring, and in this way a uniform finish is given to the flex.

The parts necessary in the construction of the model are as follows:—

3 of No. 5; 1 of No. 6A; 4 of No. 8; 4 of No. 12; 2 of No. 15A; 1 of No. 16; 1 of No. 19s; 2 of No. 35; 32 of No. 37; 2 of No. 38; 1 of No. 43; 1 of No. 45; 2 of No. 48A; 2 of No. 52; 3 of No. 53; 1 of No. 57; 3 of No. 59; 2 of No. 115; 1 of No. 166.

#### 0-4-0 Shunting Locomotive

The railway locomotive always forms a popular subject in the range of transport vehicles that can be reproduced with Meccano and the neat model 0-4-0 shunting engine illustrated in Fig. 4 should appeal particularly to many constructors.

The model represents a type of small locomotive often found in goods yards and works sidings, and although quite small it possesses

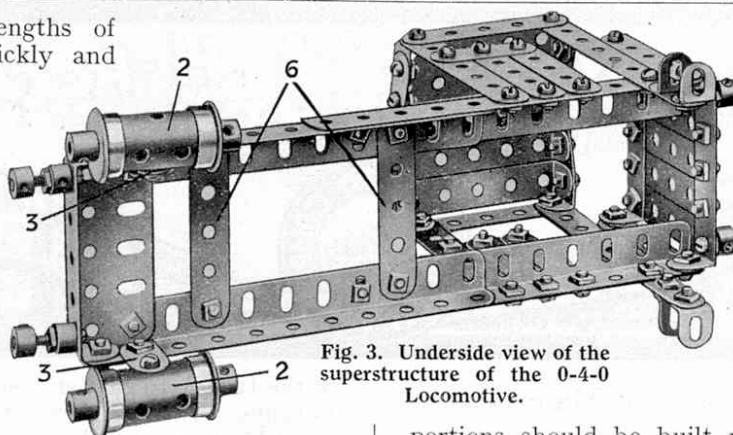


Fig. 3. Underside view of the superstructure of the 0-4-0 Locomotive.

portions should be built up separately and fitted to each other on completion.

The superstructure is shown in detail in Fig. 3. Each of the two side members is built up from two  $5\frac{1}{2}"$  Angle Girders overlapping five holes. The cab roof is composed of five  $2\frac{1}{2}" \times \frac{1}{2}"$  Double Angle Strips bolted to two  $2\frac{1}{2}"$

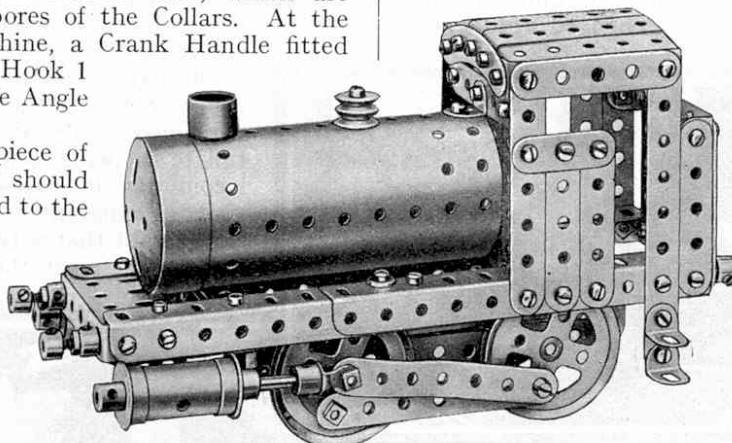


Fig. 4. A neat model 0-4-0 Shunting Locomotive.

Curved Strips and the roof is attached to the frame of the cab by Angle Brackets. The front of the cab is composed of three  $2\frac{1}{2}"$  Strips connected together so as to form three sides of a square and bolted to the Boiler by an Angle Bracket. The cylinders 2, which consist of Sleeve Pieces with  $\frac{3}{4}"$  Flanged Wheels pushed on to their ends, are bolted to the side members by means of two Flat Brackets 3 that are bent slightly outward.

The frame or under-carriage is illustrated separately in Fig. 5. Each side of the frame that carries the wheels is composed of two  $5\frac{1}{2}"$  Strips overlapping seven holes and one  $5\frac{1}{2}"$  Strip attached by Flat Brackets 4 as shown in Fig. 5.

The coupling rods 7 are attached to the front pair of wheels by bolts and lock-nuts and to the back pair by  $\frac{3}{8}"$  Bolts and lock-nuts. The connecting rods 8, which are bent slightly as shown, are attached at one end to the Bolts 9 and at the other to End Bearings in which are secured the  $1\frac{1}{2}"$  Rods that form the piston rods.

To assemble the model, the Bolts 5 are passed through the centre holes of the  $2\frac{1}{2}"$  Strips 6, and through the Boiler, and are then secured by their nuts (the Washers shown being used to space the Strips 6 from the  $1\frac{1}{2}"$  Double Angle Strips).

The parts used in the construction of the model locomotive are as follows:—

6 of No. 2; 2 of No. 2A; 6 of No. 3; 18 of No. 5; 2 of No. 6A; 4 of No. 9; 6 of No. 10; 10 of No. 12; 4 of No. 17; 4 of No. 20A; 4 of No. 20B; 2 of No. 23; 85 of No. 37; 15 of No. 37A; 10 of No. 38; 7 of No. 48A; 6 of No. 59; 2 of No. 90; 1 of No. 103F; 2 of No. 111; 5 of No. 111c; 1 of No. 116A; 1 of No. 162; 2 of No. 163; 1 of No. 164; 1 of No. 166.

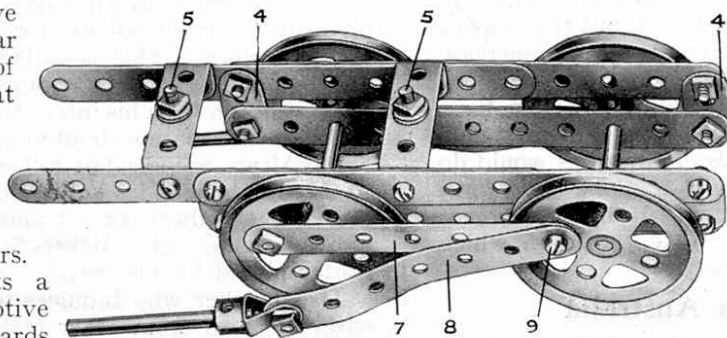


Fig. 5. Under-carriage of Locomotive, showing coupling gear.