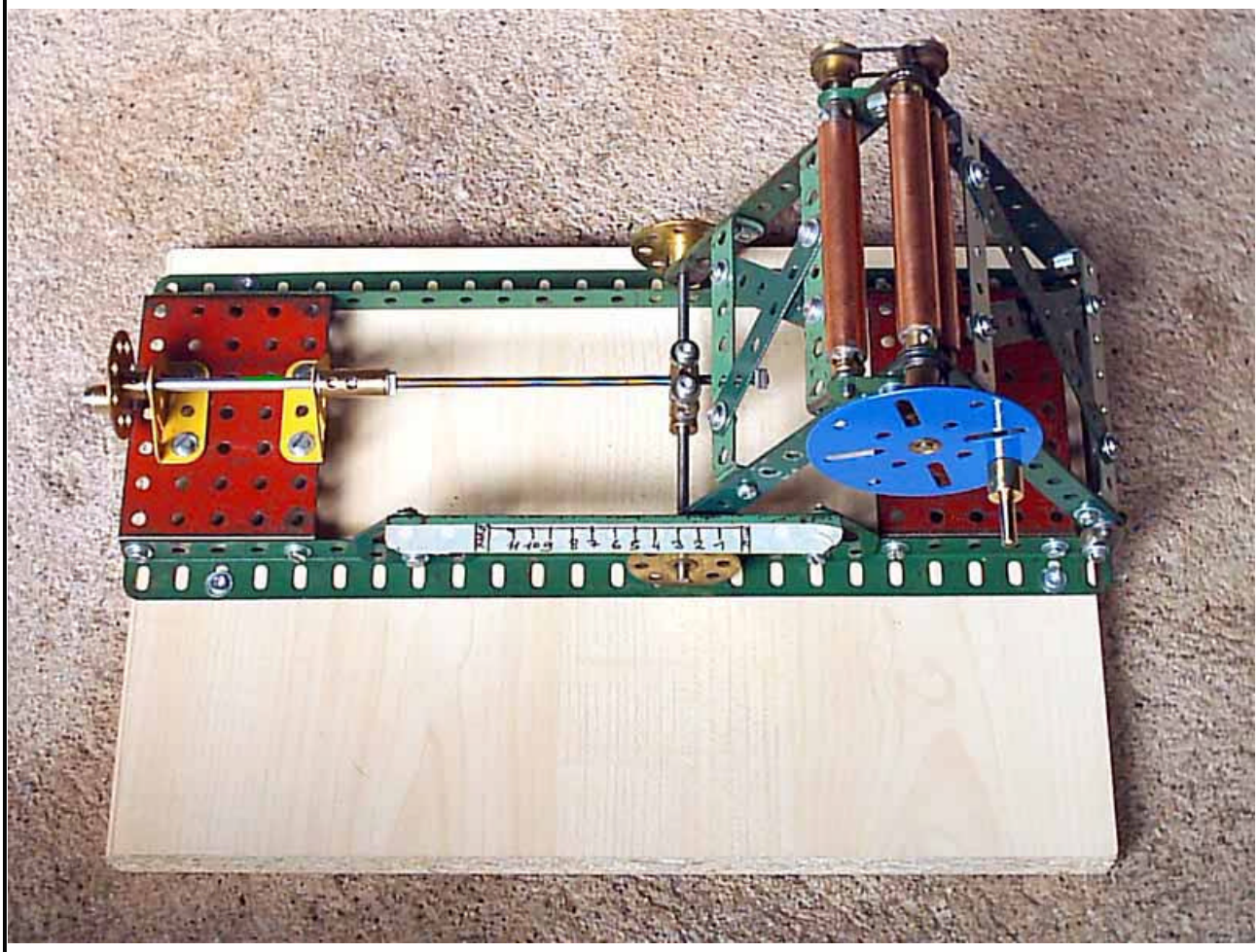
A simple V frame Plate Roller
by Peter Sullivan

In the "Fat Controller's" words, this is a VERY USEFUL Meccano accessory!

PARTS LIST: (Qty x P/N°)

8x 2, 2x 3, 2x 4, 2x 8, 1x 9, 4x 10, 4x 15a, 1x 15b, 1x 16a, 2x 23a, 3x 24, 2x 26, 38x 37a&b, 38, 4x 48b, 2x 53, 3x 59, 2x 63, 1x 63c, 6x 63d (replica!), 2x 77, 1x 80, 1x 109, 2x 111, 2x 126, 2x 126a, 1x 147b, 1x173a, 1x 186, 3x 3" length 12mm OD copper pipe.



CONSTRUCTION:

Start by cutting the 3x 3" (76mm) lengths of copper piping using a rotary pipe cutter. De-bur the ends sufficiently so that the 63d short couplings are a tight fit when inserted in the ends. They should be pushed in about ½ way so that the fixing grub screws clear the cut pipe end. (see photo of roller) Using a spare stainless steel axle to keep each set of couplings aligned along a common axis, soft solder them in place. Unless you have a giant soldering iron, you will need to use a propane gas jet to do this as the copper pipe is an effective heat sink! Take care to clean the parts before soldering and not to run too much solder into the joint which may block the bearing or tapped holes. Let the hot assembly cool down before trying to pick it up in your fingers! You can grip one end at a time in a "Workmate" type bench to safely solder each end in turn.

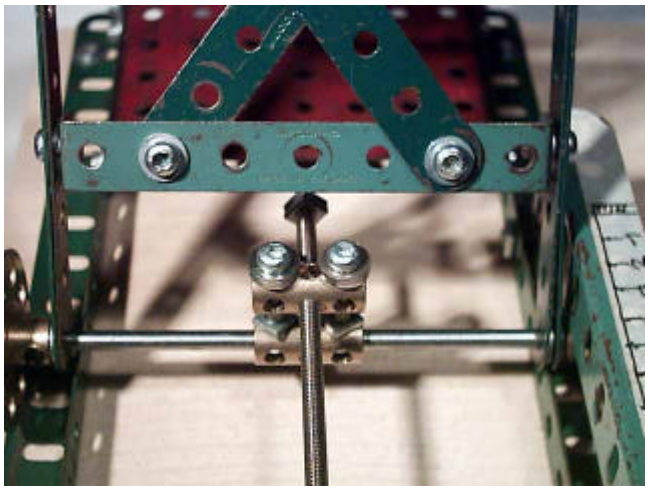
If you're unsure of your soldering abilities you can alternatively order 3 x 59kD (3" length) from Ashok, and you can then space them in adjacent ½" holes as per Arup Dasgupta.

Start the frame by bolting the 2 flanged plates to the 12½" angle girders. The left hand plate is flush with the girder ends and the right hand one is located one hole in. On the end right hand round free hole of each girder, securely bolt 2 fishplates slotted holes down aligning the round holes to take the frame bearing axle. Use washers under the bolt heads. The fishplates are doubled up to spread the load - had I had more 133a's handy, I would have probably used those, so I'm sure you will adapt and improve to whatever parts you have excess of!

Each frame half is similar and is composed of doubled up 5½" strips for each side separated by 3½" double angle brackets. The right hand frame d.a.b.'s are bolted one hole up from the bottom end, and two holes down from the top and are braced by two 3½" strips, The left hand frame's d.a.b.'s are closer together, each 4 holes from the strip ends, and braced by two 3" strips this time. (see photo). The left hand moving frame arm also carries two 1" triangular plates bolted one hole down from the top end to take the left hand exit roller.

A 4" axle held in place by collars (inside) locates the lower end of the right frame arm in the round holes of the fishplates. The frame should fit in-between the fishplate bearings. A 5" axle fitted with one of the special rollers holds each frame half together at the top, using washers to pad out roller width to the clearance available between the frames. A 19 tooth pinion and a face plate are fixed to the front end of the top axle, again using a washer between the pinion and the frame. The right hand roller is driven by a second 19 tooth pinion secured at the front to a 4½" axle rod, the rear end carrying a ½" pulley to provide a "weak" drive to a similar pulley on the last roller journalled in the free holes of the corner brackets, above the frame. Use washers & light oil were necessary to ensure friction free running of the rollers. Providing at least two of the rollers are positively driven there is no slippage problem.

Two bush wheels fitted to a 4½" rod provide a moving support for the left hand frame half and they ride on the slotted girder faces. A 5½" girder mounted on 2 trunnions restricts the movement of the front bush wheel & frame to one direction and stops it jumping up under load. A reference scale can be taped on the shorter girder to facilitate setting the curve radius.

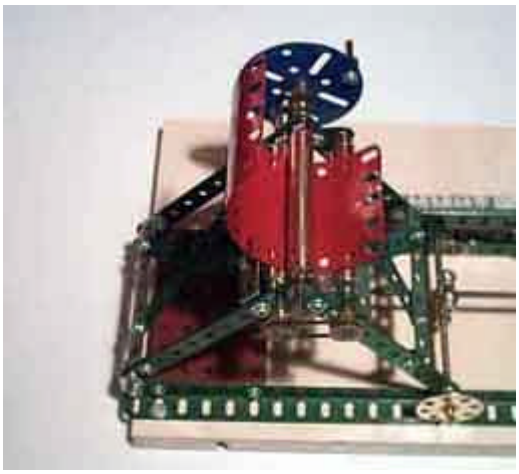


The frame angle is controlled by a 5" threaded rod fixed at one end by a threaded coupling (part 63c) and a lock nut. The other end runs in the middle horizontal threaded hole of a standard coupling (part 63). This coupling is fixed with two vertical 3/4" bolts to a second coupling below which is sliding free on the bush wheel axle. Adjust the coupling height with washers so that the screwed rod is running true and on-axis. A free collar on a pivot bolt fixed to a bush wheel hole makes an agreeable winding handle to adjust the frame angle via a short rod journalled in two trunnions. A faster action would be nice here, so you could gear up the control, and make it accessible from the front, or drive it via an electric motor for the delux version!

A rolling crank handle is made from a threaded rod adapter fixed to one of the face plate circumference holes.

Finally, fix the machine frame to a flat wooden base board with four woodscrews.

ROLLING INSTRUCTIONS:



- Close the frame up to it's minimum angle (0 on the prototype scale)

- Insert the flexible plate into the rollers from either side.

- Increase the frame angle gradually in-between rolling the plate to & fro, 1 or 2 scale steps at a time until the desired radius is achieved. Note the scale setting if several plates are to be rolled to the same curve.

- It is worthwhile to reverse the plate end fed through the rollers to optimise the evenness of the curve obtained.

- Badly creased plates can benefit from being curved in one direction, and then the other, repeating if necessary. It is quite easy to re-straighten a curved plate by giving it a slight opposite curve radius.

- If you need to roll strips, substitute a no.63 coupling for the top roller to allow enough clearance.

PJS -Oct/2003