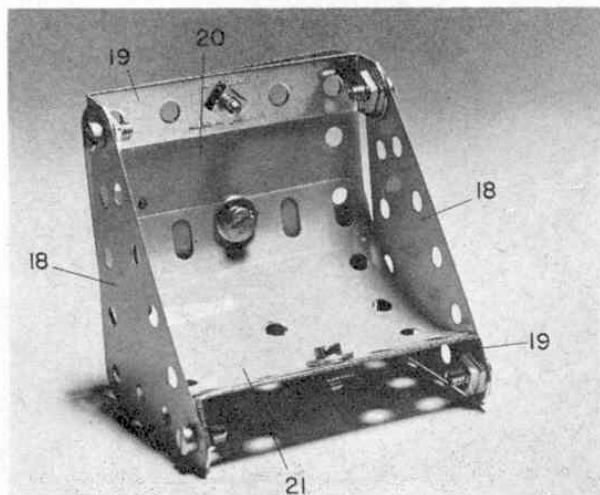


The Meccano Steam Engine, if treated with respect, is one of the most exciting power sources for a Meccano model, but it is not one which is often featured in the M.M.

IN THE December issue, Alf Hindmarsh, mourning the passing of steam power in his "Meccano Steam Era" article rightly claimed that Meccano modellers are indeed fortunate—we can enjoy all the fascination of live steam by building models powered by the Meccano Steam Engine. One of the many Steam Engine owners who agrees whole-heartedly with Alf on this subject is Robert Smith of Twickenham, Middlesex, the designer of the splendid steam-powered Tractor described in full here. He has devoted a considerable amount of building time to the Steam Engine and described it, succinctly, as "an excellent source of power."

Excellent, it undoubtedly is, and not only for the power it gives. It also adds tremendous character and atmosphere to any model in which it is fitted—far more, in my opinion, than is supplied by an electric or clockwork power unit. It seems to bring a model almost to life! To see Mr. Smith's Tractor, for example, slowly chugging along with steam hissing from the cylinder exhaust ports and the piston working away like a battering ram is a sight to behold. It just wouldn't be the same if the model moved cleanly and quietly along with no hissings splutterings and following steam clouds!

The driver's seat is easy to build and designed to be wedged in place on the model—not bolted.



LIVE STEAM TRACTOR

Spanner describes an intriguing model built by R. SMITH

The tractor is by no means a complex model. In fact, it was designed as a simple construction intended to be little more than a realistic "carrier" for the Steam Engine rather than a complicated, feature-packed scale reproduction. Nonetheless, it captures the true "feel" of the subject—and this despite running on four ordinary wheels—thanks to a pair of non-operable, but authentic-looking imitation "tracks".

One of the advantages of the Meccano Steam Engine, besides its obvious attraction as a live steam unit, is its large, strong baseplate which enables it to serve virtually as the chassis of its parent model as well as its power unit. In fact, in the Tractor, it supplies not only the chassis, but a fair amount of the body, also!

Before construction proper is begun the piston connecting rod of the engine is *carefully* slipped off its spigot on the driveshaft cam to allow the flywheel, Sprocket Wheel and Pinion to be removed from the driveshaft and replaced by a Collar and a Worm 1. The flywheel is then returned—inside the Engine sideplates—and the piston rod connected, the Collar and flywheel holding the driveshaft in place.

Once these drive modifications have been attended to, the baseplate of the Engine is extended rearwards by a $2\frac{1}{2} \times 1\frac{1}{2}$ in. Flanged Plate 2, secured to the floor of the baseplate, and by two $2\frac{1}{2} \times 1\frac{1}{2}$ in. Flexible Plates 3, secured one to each side of the baseplate. The forward Bolt fixing each of these Flexible Plates in place also holds a $1\frac{1}{2} \times \frac{1}{2}$ in. Double Angle Strip 4 and a Flat Trunnion 5 in position, as shown, then the sides are completed by two further $2\frac{1}{2} \times 1\frac{1}{2}$ in. Flexible Plates 6, bolted one to the top of each Plate 3.

At the rear, a $3\frac{1}{2} \times 2\frac{1}{2}$ in. Flanged Plate 7 is bolted to Flanged Plate 2 being spaced from it by one Washer on the shank of each securing Bolt, the Plate also being attached by Angle Brackets to the upper rear corners of Flexible Plates 6. Secured to the inside of Plate 7, in the position shown, is a Double Bent Strip 8, in which a $3\frac{1}{2}$ in. Rod is held by a Collar. The forward end of this Rod is journaled in a $2\frac{1}{2} \times \frac{1}{2}$ in. Double Angle Strip 9, bolted to the Engine baseplate, while fixed on the Rod are two $\frac{1}{2}$ in. Pinions 10 and 11, the former engaging with Worm 1 on the Engine driveshaft, and the latter meshing with a $\frac{3}{4}$ in. Contrate Wheel 12 on a 2 in. Rod mounted in the Engine sideplates and in a $1 \times \frac{1}{2}$ in. Double Bracket 13 bolted to the inside of the sideplates. Fixed on the outside end of the Rod is $\frac{3}{4}$ in. Sprocket Wheel 14.

A second $3\frac{1}{2} \times 2\frac{1}{2}$ in. Flanged Plate 15 is now bolted to Flanged Plate 7 through the latter's second row of holes down. Secured to Plate 15 is the upper lug of Double Angle Strip 9 and a Formed Slotted

Strip 16, acting as a flywheel guard, this also being attached to the Engine baseplate by a 1 × 1 in. Angle Bracket. A 2½ × 1½ in. Flexible Plate 17 is bolted to the upper flange of Flanged Plate 7 and to a 2½ × ½ in. Double Angle Strip fixed between Flexible Plates 6.

Wedged between Plates 6, immediately in front of Plate 17 and resting on Flanged Plate 15, is a removable driver's seat built up from two 2½ × 2 in. Triangular Flexible Plates 18 connected together by two 2½ × ½ in. Double Angle Strips 19. Bolted to the upper Double Angle Strip is a 2½ × 2½ in. Flexible Plate 20, to the centre of which a 2½ × 2½ in. Curved Plate 21 is fixed. The forward edge of this Plate is bolted to lower Double Angle Strip 19.

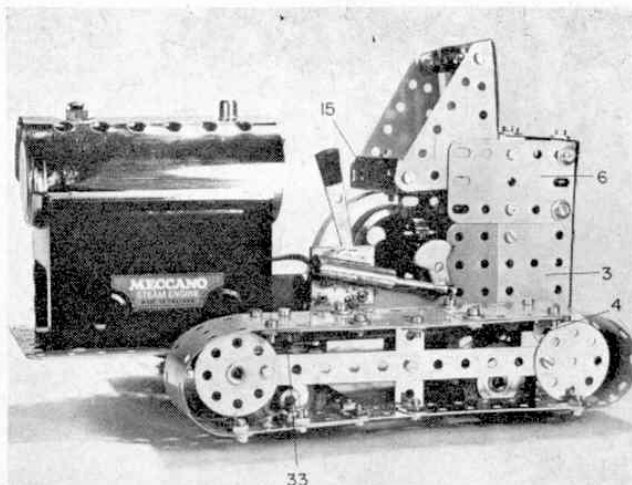
This brings us to the traction system fitted to the model. As already explained, the tracks shown in the photographs are imitation—meant only for effect—as the Tractor, itself, runs on wheels. All four wheels are supplied by 1 in. Pulleys fitted with Motor Tyres, the rear wheels being mounted on a 4 in. Rod held by a Collar and a 1 in. Sprocket Wheel 22 in the apex holes of Flat Trunnions 5. The front wheels on the other hand, are mounted, boss outwards, on a 5 in. Rod 23, journalled in the apex holes of two Trunnions 24 bolted to the underside of the Engine baseplate. Sprocket Wheel 22 is connected by Chain to Sprocket Wheel 14.

Each imitation track is produced from two 5½ in. Strips 25, to which a 2½ × 1½ in. Flexible Plate 26 and two 5½ × 1½ in. Flexible Plates 27 are bolted, Plates 27 being so arranged that they each project a distance of seven holes beyond the ends of the Strips. These same Plates are curved round and under, as shown, to be joined together by two 6½ in. compound strips 28, built up from 5½ in. Strips extended by 2½ in. Strips. The centre of the outer Strip 25 is connected to the centre of outer compound strip 28 by a 1½ × ½ in. Double Angle Strip 29, to which a 5½ in. Strip 30 is bolted at right-angles. An 8-hole Bush Wheel 31 is secured to the forward end of this Strip, while an 8-hole Wheel Disc 32 is secured to the rear end of the same Strip.

When completed, each track is attached to the Tractor towards the front by a ½ in. Reversed Angle Bracket 33 held by the rear Bolt fixing respective Trunnion 24 in place. Towards the rear, the track is bolted to Double Angle Strip 4, both tracks finally being joined together underneath by two 5½ in. Strips 34 bolted between compound strips 28, at the same time extending the ends of forward Strip 34 by Fish-plates which serve to secure the compound strips in each pair to each other.

This, then, completes construction of the model, but, before closing, there are one or two things that must be stressed. Firstly, great care must be taken when disconnecting the piston rod of the Steam Engine from the driveshaft at the start of operations to ensure that no damage is done either to the piston rod or the driveshaft-crank spigot. The rod is best disconnected, when fully extended, by pressing the cylinder pivot bolt inwards to bring the cylinder out away from the cylinder block, at which time the rod can quite easily be slipped off its spigot. Excessive force must never be used.

The second important point to remember is that the Steam Engine is a genuine live steam unit, operating at very high temperatures, and it must be treated with great respect. The operating instructions should be followed exactly and, under no circumstances, should the boiler or firebox be handled once the ignited burner is mounted in position, unless you want a painful burn! (I know this from experience!) The boiler should not be allowed to burn completely dry and should never be re-filled with water with the burner alight and in position.



One of the advantages of the Meccano Steam Engine is that the Engine, itself, can serve as a sturdy chassis for a model. In this Steam Tractor, designed and built by R. Smith, it supplies a large part of the body, as well!

Finally, when building the model, it is essential that friction is kept to an absolute minimum, otherwise the model may not operate satisfactorily. The Tractor is pretty heavy and the Steam Engine does not have a lot of power left over above that needed to drive the model, therefore, unnecessary friction may result in failure. With careful adjustment and the help of a suitable lubricant, however, a really impressive working model will be your reward.

PARTS REQUIRED

12-2	2-24	4-48a	2-126a
4-5	2-24a	1-51	4-142c
2-10	2-26	2-53	7-188
1-11a	1-29	4-59	4-189
2-12	1-32	1-94	1-190
1-12a	89-37a	1-96	1-200
1-15	89-37b	1-96a	1-215
1-15b	32-38	2-125	1-222
1-16	1-45	2-126	1 Meccano
4-22	4-48		Steam Engine

An underside view of the model showing the imitation track bases together with the wheels and axles actually used for traction.

