

## Tank Locomotive

### A Grand Model for Outfit No. 5

THIS realistic model 0-4-4 Tank Locomotive has many attractive features, including working coupling rods. The model is designed for construction with parts in a No. 5 Outfit.

The main frame of the Locomotive is made by bolting two  $12\frac{1}{2}$ " Angle Girders to the side flanges of a  $5\frac{1}{2}$ "  $\times$   $2\frac{1}{2}$ " Flanged Plate, overlapping the parts six holes. A  $2\frac{1}{2}$ "  $\times$   $\frac{1}{2}$ " Double Angle Strip 1 is bolted in the third holes from the front ends of the Girders. A made-up strip, formed by two  $12\frac{1}{2}$ " Strips overlapped 20 holes, is attached to each  $12\frac{1}{2}$ " Angle Girder by two Fishplates. Another made-up strip 2 on each side is supported by  $2\frac{1}{2}$ " Stepped Curved Strips as shown in Fig. 1.

Strip 2 consists of a  $12\frac{1}{2}$ " and a  $5\frac{1}{2}$ " Strip overlapped six holes. A  $2\frac{1}{2}$ "  $\times$   $\frac{1}{2}$ " Double Angle Strip 3 is bolted between the strips 2. To complete the main frame two  $12\frac{1}{2}$ " Strips on each side are connected to the front end of the Angle Girder by an Angle Bracket and are supported at the rear by a Double Bracket bolted to the Flanged Plate.

The water tank on each side consists of a  $5\frac{1}{2}$ "  $\times$   $2\frac{1}{2}$ " and a  $2\frac{1}{2}$ "  $\times$   $2\frac{1}{2}$ " Flexible Plate

bolted together. These Plates are supported by a  $2\frac{1}{2}$ "  $\times$   $\frac{1}{2}$ " Double Angle Strip at the front and by an Angle Bracket at the rear. The Double Angle Strip is bolted by its lower lug to the Angle Girder, and another Double Angle Strip is held by the same bolt. The upper lug of the second Double Angle Strip supports a strip 4, made from two  $5\frac{1}{2}$ " Strips overlapped 9 holes.

Strip 4 is connected to the side of the water tank by an Angle Bracket.

Each side of the coal bunker is a  $2\frac{1}{2}$ "  $\times$   $2\frac{1}{2}$ " Flexible Plate fixed to a Fishplate bolted to the Double Bracket at the rear of the frame. The

rear edge of the Flexible Plate is strengthened by a  $2\frac{1}{2}$ " Strip. The back of the coal bunker is made by fixing a  $2\frac{1}{2}$ "  $\times$   $1\frac{1}{2}$ " Flanged Plate, extended at each side by a  $2\frac{1}{2}$ "  $\times$   $1\frac{1}{2}$ " Flexible Plate, to the rear end of the  $5\frac{1}{2}$ "  $\times$   $2\frac{1}{2}$ " Flanged Plate. The sides and the back of the coal bunker are connected by  $1$ "  $\times$   $1$ " Angle Brackets.

The smoke-box is formed by two  $5\frac{1}{2}$ "  $\times$   $1\frac{1}{2}$ " Flexible Plates rolled into a circle and bolted round a  $2\frac{1}{2}$ "  $\times$   $\frac{1}{2}$ " Double Angle Strip. The front section of the boiler consists of two curved  $4\frac{1}{2}$ "  $\times$   $2\frac{1}{2}$ " Flexible Plates attached to the smoke-box, and these are extended

Fig. 1. The attractive model 0-4-4 Tank Locomotive shown above is designed for construction with the parts included in a No. 5 Outfit. Working coupling rods are one of its many interesting features.

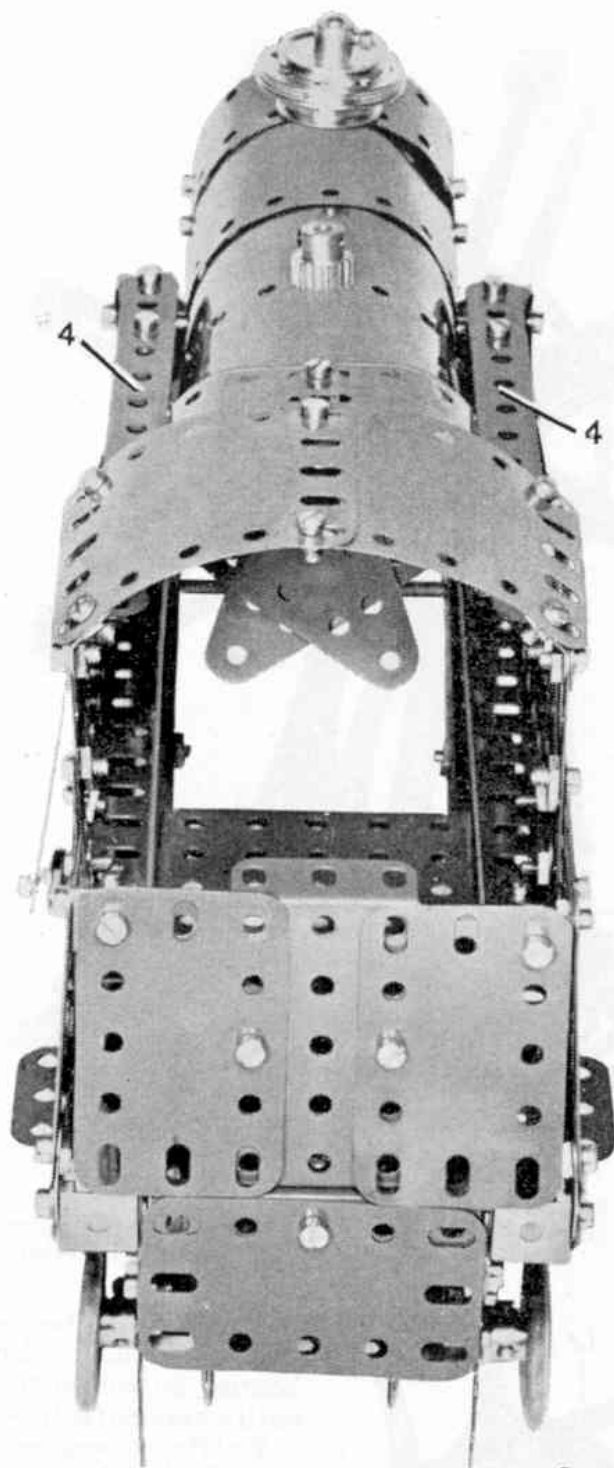


Fig. 2. Looking down on the model to see the details of the cab and boiler plating.

towards the rear by two curved  $5\frac{1}{2}'' \times 2\frac{1}{2}''$  Flexible Plates 5. To make the chimney a 1" Pulley, four Wheel Discs and two 1" loose Pulleys are placed on a 2" Rod, which is passed through the Flexible Plates and is held in place by a Bush Wheel. The dome is a  $\frac{1}{2}''$  Pinion fixed on a Threaded Pin. The front of the smoke-box is made from two Semi-Circular Plates.

At the front the smoke-box is supported by a Double Bent Strip 6, the bolts being used also to fix in place a Flanged Sector Plate and a  $2\frac{1}{2}'' \times 1\frac{1}{2}''$  Flexible Plate. Two  $\frac{1}{2}''$  Reversed Angle Brackets are bolted to the front ends of the  $12\frac{1}{2}''$  Angle Girders, and two  $3\frac{1}{2}''$  Strips connected by Fishplates are attached to the Reversed Angle Brackets. The buffers are  $\frac{3}{4}''$  Washers spaced from the lower  $3\frac{1}{2}''$  Strip by Spring Clips and Washers on a  $\frac{3}{8}''$  Bolt and a Pivot Bolt. The rear end of the boiler is bolted to two opened-out U-section Curved Plates, which are attached to Angle Brackets bolted to the strips 4.

The cab roof consists of two  $1\frac{1}{16}''$  radius Curved Plates supported by Obtuse Angle Brackets, which are bolted to  $2\frac{1}{2}''$  Strips on each side as shown. Two  $2\frac{1}{2}'' \times 2''$  Triangular Flexible Plates are bolted to a Double Bracket, fixed centrally to the front edge of the roof.

The front pair of driving wheels is fixed on a 4" Rod mounted in Flat Trunnions, and the rear pair is arranged on a 4" Rod supported in  $1\frac{1}{2}''$  Strips. A  $5\frac{1}{2}''$  Strip 7 on each side is slipped over the Rods before the Road Wheels are fixed in place. An Angle Bracket is attached to the boss of each Road Wheel by placing three Washers on a bolt, inserting the bolt through the slotted hole of the Angle Bracket and then screwing it tightly into a threaded hole in the boss. The Angle Brackets on each side are

(Continued on page 634)

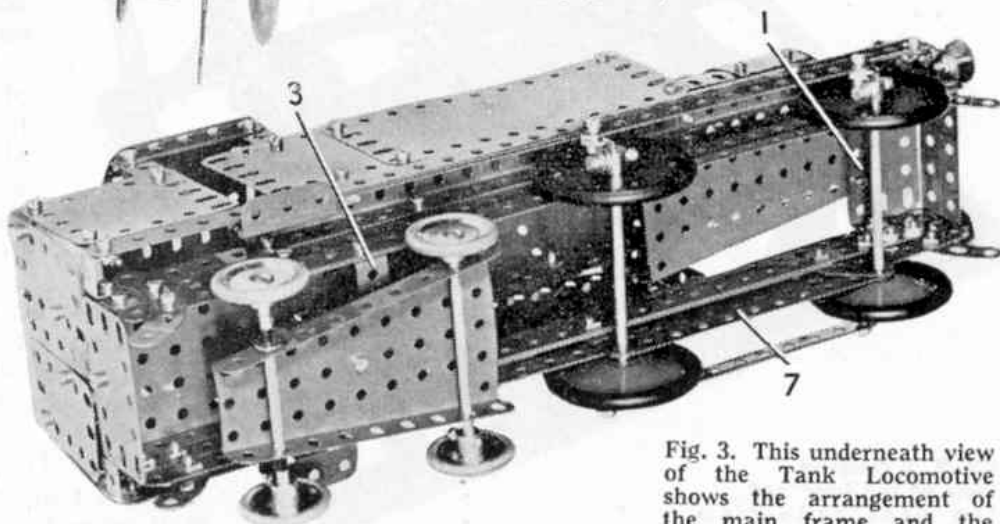


Fig. 3. This underneath view of the Tank Locomotive shows the arrangement of the main frame and the axle bearings.

**The Star of Bethlehem**—(Continued from page 583)

out that the light from even the nearest takes hundreds of years to reach us. It is therefore difficult to believe that the Star of Bethlehem comes into this category. To do so would mean that a Star created centuries before it became visible from the Earth was the harbinger of the Nativity, and this idea is directly contrary to all testimony about the phenomenon. All accounts show that the Star of Bethlehem was something that appeared for only a brief time, too. But it is unlikely that it could have been an unidentified comet, since with few exceptions comets follow orbits that involve their reappearance. Yet it might of course have been a comet that was one of the exceptions and became lost to us.

The more this Christmas mystery is investigated, the harder it seems to solve. Historians and geographers, as well as astronomers, have applied their knowledge to it. For instance, historians have pointed out that comets were long regarded as omens of evil, and that if the Star were such a celestial body it is hard to understand why it was welcomed by the Wise Men.

Geographers have helped astronomers' investigations by determining as far as possible the route from the East to Bethlehem 2,000 years ago. At that distant period the journey would probably follow a somewhat different route than might be expected today, and information about the old trails has helped to show whether certain planets and stars could in fact have served as a guide to the Manger.

All in all, however, the most that can be said with certainty about the Star of Bethlehem is that it was no imaginary or allegorical phenomenon. Even 2,000 years ago the science of astronomy existed, mariners having some knowledge of it, and the celestial light marking the first Christmas must have been exceptional to be regarded as a harbinger of glad tidings.

Whether we look upon it as a miracle or a heavenly marvel capable of scientific explanation, it remains a wonder still.

**People and Craft of the Narrow Canals**—

(Continued from page 588)

Talking of *The Friendship*, what magic there is in the names of boats and what scenes the memory conjures up when we see *Sunny Valley*, *Forget-me-Not*, *Clygate*, *Aster* and other beautiful names!

Much has been written about the education of the canal boat children. They are the product of a folk who are skilled in their own job, and you should see some 10-year-olds handling a pair of boats! Illiterate some of them may be by "modern" standards, yet they have an outlook and psychology that would give a lead to many people "off the land." We are proud of our association with them.

In closing, a word of warning please. If you should perchance be on a lock side when some boats are locking through, do not stand and stare into the cabin. It is the boatman's home. He is justly proud of it, and values its privacy. Get to know him and you may be lucky enough to be invited inside.

**Rockets are not New!**—(Continued from page 615)

and range of European weapons. The Europeans themselves put the rocket to occasional use. The Italians used rockets with some success in their private wars of the 14th Century, and British pirates occasionally used rockets to set fire to the ports they besieged on the Spanish Main. But generally the rocket found little use in European warfare, because of the erratic flight and unpredictable range of the crude rockets used. They could only be used against a large target, such as a besieged city.

Meanwhile, in India, war rockets had developed to a stage where they could be used against troops and small targets, such as individual buildings. The Indian rocket of the 18th Century was contained in an iron tube and guided by a long bamboo pole. These rockets

were fitted with explosive, fragmentation and incendiary shells in their heads. They were probably used for the last time at the battle of Seringapatam, Mysore, in 1799, when Prince Tipu Sahib used more than five thousand rocket throwers in his fight against the British. Regiments of rocket throwers were at this time an integral part of many of the Indian Armies.

The effectiveness of the Indian rocket revived interest in Great Britain and Colonel (later Sir) William Congreve developed a rocket with a range of three thousand yards and weighing up to forty pounds. Two hundred of Congreve's rockets were first used against the French at Boulogne on the evening of 8th October, 1806, setting fire to part of the town. Spurred on by their success, the British Navy used over forty thousand rockets in the Battle of Copenhagen. But so many of the rockets hit British ships, or even returned to their senders, that the Navy was reluctant to put them to further use.

Congreve continued to develop his rocket, however. He fitted shells to increase their military usefulness and in 1812 the British Rocket Brigade was formed and saw action against Napoleon's Army. The British also used rockets against the Americans at the Battle of Bladensburg in 1814. But with the rapid improvements in artillery during the 19th Century the rocket lost favour as a military weapon and was almost forgotten for a century. Then the modern rocket appeared, during World War II, in the form of the famous Bazooka, followed by a large variety of naval and aircraft rockets, and finally by the German V-1's and V-2's. Congreve's rocket was not completely forgotten, however, since it continues to be used to this day as the well-known life-saving rocket to be found in Coast Guard Stations all over the world.

**Running a Hornby Engine**—(Continued from page 610)

probably will be used for passenger or goods traffic. It will therefore have to divide its time between the two kinds of services, and this will lend variety to the working that will be found quite enjoyable.

As the layout develops, perhaps another engine will become available and then the duties of the two can be made to fit in with one another in a realistic manner. They can take turns at working passenger and goods trains perhaps, or it may be that you will prefer to keep each one to its own particular kind of duty.

Look at the pictures on pages 609-610. I hope they will help to give you one or two ideas. In the first one the No. 40 Tank begins its day by taking a Goods Brake Van along the line to pick up some wagons. In the second, the No. 50 Locomotive is hard at work and then, finally, we see engines "at home". The tender engine is in fact "ready for off" again and is only waiting for the Points to change.

**Meccano Tank Locomotive**—(Continued from page 625)

connected by a 5½" Strip, pivoted on ¾" Bolts fixed in the Angle Brackets by two nuts each.

The bogie is a Flanged Sector Plate and its wheels are 1" Pulleys with Rubber Rings fixed on ¾" Rods. A ½" Reversed Angle Bracket is bolted tightly to the Flanged Sector Plate and is lock-nutted to the centre of Double Angle Strip 3.

Parts required to build the Tank Locomotive: 10 of No. 1; 10 of No. 2; 2 of No. 3; 8 of No. 5; 2 of No. 6a; 2 of No. 8; 8 of No. 10; 3 of No. 11; 12 of No. 12; 2 of No. 12a; 4 of No. 12c; 2 of No. 15b; 2 of No. 16; 1 of No. 17; 5 of No. 22; 2 of No. 22a; 1 of No. 24; 2 of No. 24a; 2 of No. 24c; 1 of No. 26; 4 of No. 35; 118 of No. 37a; 110 of No. 37b; 16 of No. 38; 2 of No. 38d; 1 of No. 45; 8 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 54; 4 of No. 90a; 2 of No. 111a; 6 of No. 111c; 1 of No. 115; 3 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 147b; 4 of No. 155; 4 of No. 187; 4 of No. 188; 2 of No. 189; 4 of No. 190; 2 of No. 191; 4 of No. 192; 2 of No. 199; 2 of No. 200; 1 of No. 212; 2 of No. 214; 2 of No. 222.