

Fig. 1

Take:  
 one Army  
 Multikit,  
 one Motor  
 with Gearbox,  
 just a few  
 extra parts  
 and build this...

# SELF-PROPELLED GUN

BASED ON A famous piece of Second World War American artillery this Meccano Model was a prize-winner for Roger Lloyd at the inaugural meeting of the Society of Advanced Meccano Constructors. Because of the realism of the parts included in the Army Multikit, Roger felt that they could be made up into a mobile and motorised form if the problem of mounting the Meccano Motor-with-Gearbox could be solved. He hit on the ingenious solution of raising the chassis by fitting extended running gear which not only gave the ground clearance required, but added both to the realism and to the running performance of the plastic crawler tracks.

Struck by the novelty of Roger's model, BERT LOVE, the Society's Secretary, sent us the photographs and write-up for this article.

Fig. 1 showing the general view of the model, immediately identifies it with the prototype U.S.A. Self-propelled Gun mounted on a Sherman or Grant type chassis. This model drives smoothly in either direction, climbs a 30° slope with ease and has a swivelling gun complete with cocking mechanism and spring-loaded firing mechanism. Construction starts with the chassis main plate which is a 5½" x 2½" Flanged Plate, its flanges being extended downwards by two 5½" x 1½" Flexible Plates 1 as

seen in Fig. 2. A pair of 7½" Strips 2 extend these side plates at their bottom edges by two holes at either end and are mounted inboard.

At the rear end of the chassis, a pair of Flat Trunnions 3, mounted vertically, add support to the Flexible Plates and also provide extra bearing surface for the rear axle. At the forward end of the chassis, the Flat Trunnions (4) are set at an angle,

the apex hole of the Trunnion being bolted through the flange of the Flanged Plate, one hole back from its end and the Trunnion is then swung forward until the last of its other three holes matches up with the third hole back in the 7½" Strip and the end hole of the 5½" Flexible Plate. As far as the forward Trunnions are concerned, a similar construction is used on the Heavy Tank illustrated on page 35 of the Army Multikit

Above: a general view of the completed Self-propelled Gun designed by Roger Lloyd and described here by Bert Love. Powered by a Meccano Motor-with-Gearbox it features working crawler tracks and firing gun and is built from an Army Multikit, plus a few extra standard parts. Right: A detailed underside view, showing additional track running gear required. Motor should be set in the 16:1 ratio for climbing activities.

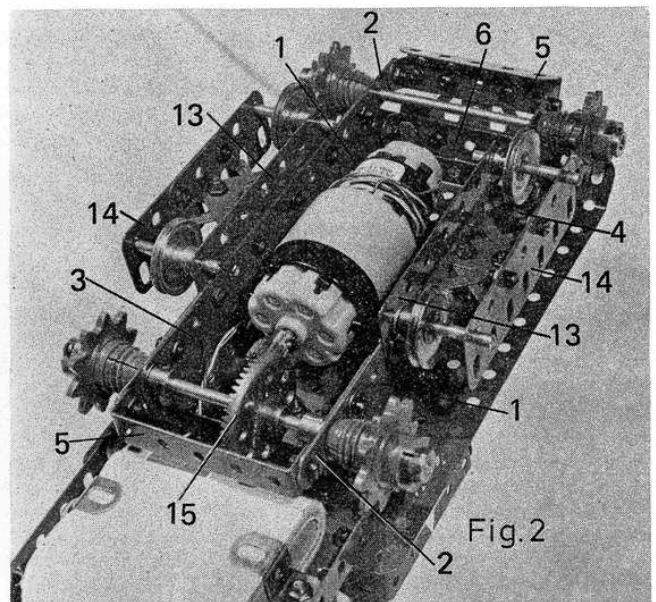


Fig. 2

Manual. The unorthodox mounting of these latter Flat Trunnions gives a slope-front contour to the chassis plates at the front.

Final strengthening of the chassis is provided by one  $2\frac{1}{2}$ " Double Angle Strip 5 at each end of the  $7\frac{1}{2}$ " Strips and one more (6) bolted to the forward end holes of the front Flat Trunnions. These two forward Double Angle Strips set the angle of the frontal armour plate which is continued by bolting a further Flat Trunnion by its two upper and outer holes to the top Double Angle Strip, but a pair of obtuse Angle Brackets 7 are bolted on with the Trunnion, at the same time. The lower apex end of the Trunnion is sandwiched against the bottom Double Angle Strip by overlaying it with a  $2\frac{1}{2}$ " Angle Girder 8.

At this stage, the upper deck armour plate should be fitted. This consists of two  $5\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flat Plates 9, overlapped one hole along their length and bolted to the chassis three holes back from the front edge of the Flanged Plate. Lapping the Flat Plates gives an uneven deck, so two  $5\frac{1}{2}$ " Strips 10 are used to level things up. One of them goes *under* the right-hand Flat Plate along the edge of the Flanged Plate underneath, while the second Strip lies on top of the left-hand Flat Plate, in its centre.

Continuing by building the gun platform, a  $3\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flanged Plate 11 is bolted across the deck at the rear, its position and the siting of the Bolts being clear from Fig. 3. Placing the Bolts like this ensures that the gun platform is fixed through the packing  $5\frac{1}{2}$ " Strips already mentioned and will not distort when the Bolts are tightened.

Now the gun swivel can be fitted and this is made from two Trunnions bolted to a Wheel Flange 12 and again, to keep things level, the Trunnions are mounted with their flanges outward. To centralise the Wheel Flange, the remaining Flat Trunnion in the Multikit is trapped underneath it by the Bolt holding the upper Trunnions. A  $\frac{3}{4}$ " Bolt is fitted with a Washer, pushed through the centre of the Wheel Flange and then fitted with a Collar as a stand-off bush for the gun swivel. This prevents the rim of the Wheel Flange from scoring the paintwork. A further Washer is added when the Bolt is pushed through the centre of the gun platform and, finally, two lock-nuts are fitted over the Washer to secure the pivot from below.

Before proceeding any further with the gun, the motor and running

gear should be fitted. A Meccano Motor-with-Gearbox is mounted, as shown in Fig. 2, with four  $\frac{3}{8}$ " Bolts and Washers in the position indicated in Fig. 1, where the Bolts can be seen forming a square just in front of the gun shield. It is advisable to use forceps or tweezers to get the Nuts fitted once the Bolts are in place, as things are a little cramped below chassis.

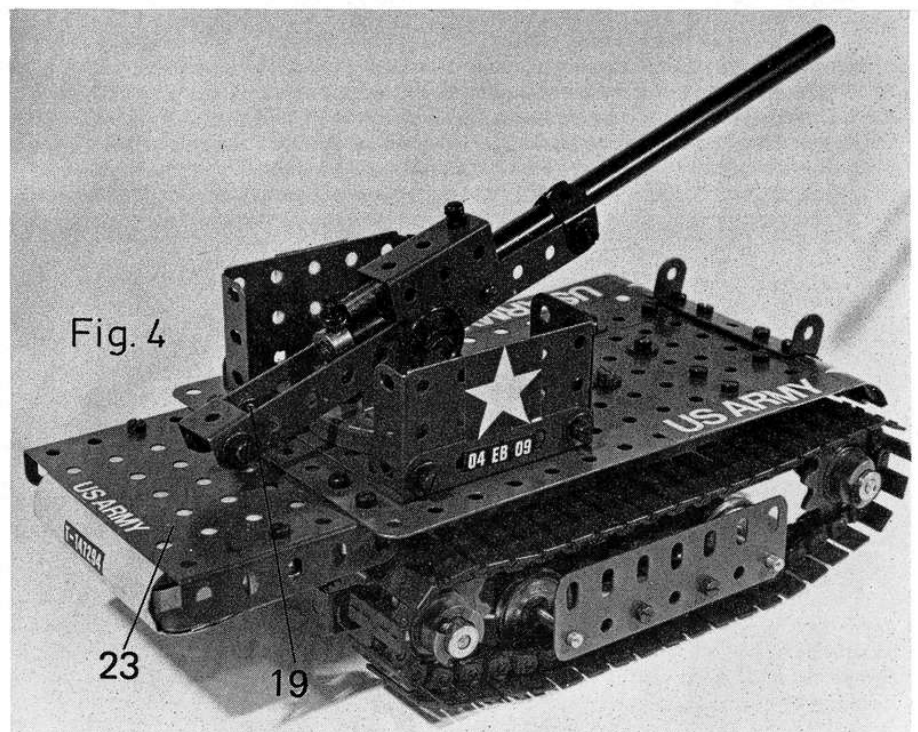
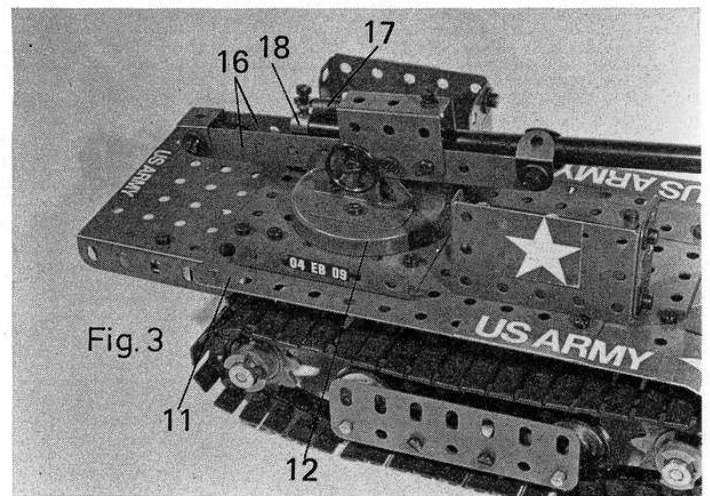
We now come to the 'extras' required for the track running gear and the first of these is a pair of  $3\frac{1}{2}$ " Flat Girders 13 bolted outboard of the  $7\frac{1}{2}$ " chassis Strips as shown in Fig. 2. Outriggers, made of reversed pairs of Trunnions, hold the other pair of Flat Girders 14 found in the Multikit and these are lined up with the inboard Flat Girders. Two  $5\frac{1}{2}$ "

Rods are provided in the Army Multikit and these should be used to line up the four Flat Girders by passing the long Rods right through from one side of the model to the other, holding them in place temporarily with Spring Clips, or rubber bands. When satisfied that all holes are properly aligned and that the model sits level on its Flat Girders when placed on a table top, all Bolts are tightened securely.

Two sets of crawler track, of 42 links each, are made up and set to one side. Both  $5\frac{1}{2}$ " (plain) Rods are fitted through the chassis as shown in Fig. 2, making sure that the rear bearings are free by drifting the rear Trunnions 4, bolted against the  $7\frac{1}{2}$ " Strips, with an Axle Rod. No binding of any kind should be allowed. The

over →

**Right:** in this view the left-hand gun shield has been removed to show the details of the swivel mounting and firing mechanism. **Below:** a general rear view of the completed model showing the battery storage platform bolted to the rear deck armour. The long battery lug makes contact with the chassis via a Reversed Angle Bracket.





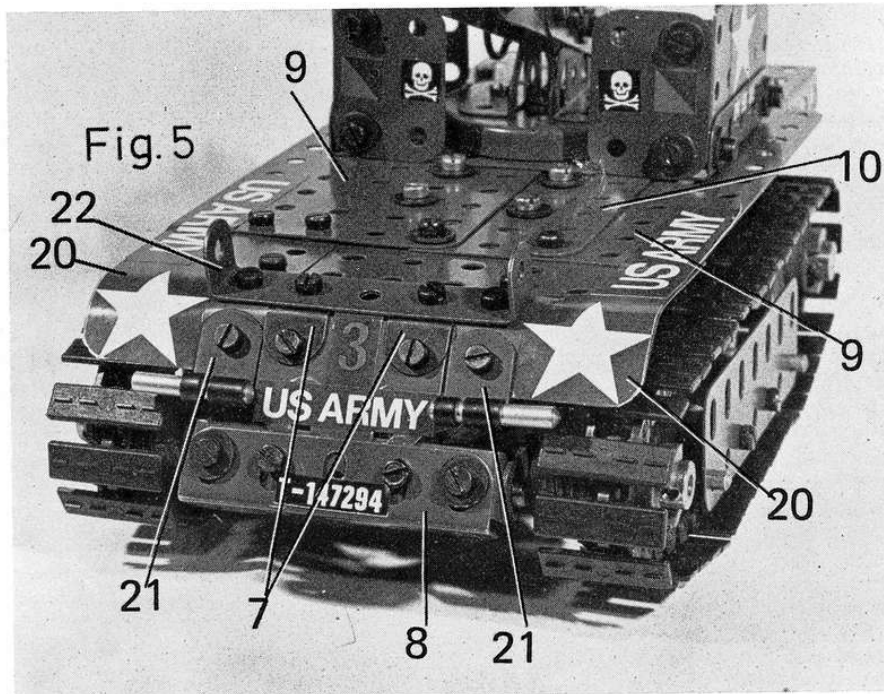


Fig. 5  
A close-up frontal view of the Self-propelled Gun showing details of the front armour plating and fittings, as well as suitable locations for the adhesive stickers supplied with the Army Multikit. The stickers add a final touch of realism to a first-class model.

short sleeve pieces are fitted inside each Sprocket Wheel which are then placed in position. The front Axle must also run freely and the two Sprockets which it carries are held in place by Collars fitted with standard Grub Screws. The rear Axle carries two Washers, two Collars and a large Contrate Wheel 15 as shown, the Collars acting as thrust bearings to hold the Contrate in clean mesh with a 19t Pinion on the motor shaft. The motor drive should be tested at this stage, before fitting the tracks, to make sure that all runs sweetly with no binding or tight gear mesh. The smallest drop of fine oil can be applied to the rear axle bearings.

The rear Sprockets are fitted with Collars, each of which has two long Grub Screws to give a firm drive against the cut-away sections of the Sprockets. The crawler tracks are added, then the final parts of the running gear, illustrated in Fig. 2, are mounted in the Flat Girders. Four 1" Pulleys with boss are required and four 1½" Axle Rods. Apart from one Washer on each Rod, no further parts are needed here, as the track keeps the short Rods in position by bearing sideways against the Pulleys.

Referring back to Fig. 3. the gun can be completed and fitted. Two 5½" Strips 16 are fixed inside a Channel Bearing, as shown, with two standard Bolts on each side. The rear ends of the Strips are joined by

a ½" Double Bracket and the front ends by a ¾" Bolt, fitted with Washers and the last pair of Obtuse Angle Brackets to trap the forward end of the gun barrel. A ½" Bolt is lock-nutted to the top front of the Channel Bearing, this being used to trap the forward loop of the Tension Spring 17 and to apply pressure to the gun barrel. The ¾" Bolt holding the two Obtuse Angle Brackets must be fitted with three Nuts to lock the Brackets tightly in place against the barrel. A Collar 18 is secured on a 2½" Rod by a 3/8" Bolt from below to make a firing plunger. This is inserted into the barrel and, fixed to it by a 3/8" Bolt, is the rear end of the Tension Spring. Another 3/8" Bolt 19 with two lock-nuts is used to form a cocking pin and this is fixed to right-hand 5½" Strip 16, just in front of the Double Bracket. This can just be seen in Figs. 3 and 4. The lock-nuts are adjusted so that the 3/8" Bolt will hold the lower Bolt under the Collar when the gun is cocked, but has sufficient clearance to release the plunger when the upper Bolt on the Collar is flicked to the left.

The gun is mounted on its swivel by passing a 1.1/8" Bolt through the Steering Wheel shown, and then through the rear lower holes of the Channel Bearing straddling the top holes of the Trunnions, securing all in place with a Washer and lock-nuts

on the far side. The gun shield is completed as shown.

Two 2½" x 1½" Flexible Plates 20 form mud shields at the front of the model and these are bolted under the leading edges of the deck armour as shown in the various illustrations. A clean bend is set into the forward section of these Flexible Plates, as shown, to follow the contours of the chassis Trunnions below, and the inside slotted hole of each Plate is fixed to Double Angle Strip 6 by Bolts carrying Right-angled Rod and Strip Connectors 21. This should be clear from Fig. 5. Each Rod and Strip Connector is fitted with a 1" Rod to provide towing points. The remaining Double Angle Strip 22 is now bolted to the front Obtuse Angle Brackets and then to the second holes back in the short Flexible Plates. The lugs thus provided could then be extended by Narrow Strips to form a travelling gun support, if required.

Readers may be surprised to see that a pocket flash lamp battery of only 4½ volts is provided. This is fitted by Reversed Angle Brackets (extra to the Multikit) to a 3½" x 2½" Flanged Plate 23 bolted to the stern of the gun chassis. One wire to the motor is trapped by one of these Brackets, making a bare chassis connection against the long battery lug. The short lug is bent clear of the chassis and the second wire has its bare end clenched by nipping a bend in this lug with a pair of pliers.

It only remains for the builder to decorate his model with the first class adhesive transfers included in the Army Multikit and the final transformation makes an astonishing touch to the realism of the model (not to mention conveniently hiding some slotted holes in the armour!) Set the Motor on 16:1 ratio, and away she goes!

As the Meccano Army Multikit is a complete and self-contained outfit, a fully itemised parts list for the Self-propelled Gun is not required; anybody with an outfit automatically has all the Multikit parts needed to build the model. However, a few extra standard Meccano parts are required and we list these below for the benefit of those readers wishing to complete this superb construction.

**Extra parts required for running gear and battery support.**

4-18a	4-22	6-38	2-103d
4-111a	2-111c	2-124	1-26
1-28	1 Meccano Motor-with-Gearbox.		