Among the Model-Builders

By "Spanner"

Twin Rear Axle Drive

I have received many requests for details of suitable driving arrangements for model vehicles fitted with twin rear axles, and to meet these I am illustrating in Fig. 1 one method of assembling such a mechanism. In this example the twin rear axles are carried by a single leaf spring on each side as shown in Fig. 1. Each spring consists of one $7\frac{1}{2}''$, two $5\frac{1}{2}''$, one $4\frac{1}{2}''$, two $3\frac{1}{2}''$ and two $2\frac{1}{2}''$ Strips. They are bolted at their centres to a $1\frac{1}{2}''$ Angle Girder that can be lock-nutted to the chassis.

Each of the axles is identical in construction. The casing consists of halves, formed by two $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips bolted between a Face Plate and a Bush Wheel. The halves are joined by two $2\frac{1}{2}'' \times 1''$ Double Angle Strips, and a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate is curved to shape and bolted in position.

The differential crown wheel is a 57-tooth Gear 1, which is free to turn on a Rod mounted in one half of the axle casing. The Rod passes into a Coupling 2, and a $\frac{7}{8}''$ Bevel Gear is fixed between the Gear 1 and the Coupling. A second Bevel 3 is fixed on a Rod mounted in the other half of the axle casing and passed into Coupling 2.

Two $1'' \times \frac{1}{2}''$ Angle Brackets are attached by $\frac{3}{8}''$ Bolts to the Gear 1, but they are spaced from it by four Washers on each Bolt. A $2''$ Rod 4 is passed through the $1'' \times \frac{1}{2}''$ Angle Brackets, and is fixed in the centre transverse hole of Coupling 2. A $\frac{7}{8}''$ Bevel Gear on each side of the Coupling is free to turn on Rod 4. Fishplates are used to centre the Rod in the slotted holes of the $1'' \times \frac{1}{2}''$ Angle Brackets.

The drive to the crown wheel is through a Worm fixed on a $3\frac{1}{2}''$ Rod mounted in $1\frac{1}{2}''$ Strips 5. These Strips are bolted to the $2\frac{1}{2}'' \times 1''$ Double Angle Strips placed between the Face Plates. The driving Rod of the trailing axle is linked to that of the leading axle by two Universal Couplings and a $1''$ Rod.

The axle casings are completed by $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates curved to shape.

Crosshead and Slide Bars for Engines

A useful method of constructing a crosshead and slide bars for engine models is illustrated in Fig. 2. The slide bars on each side are represented by two $7\frac{1}{2}''$ Angle Girders attached together by $1\frac{1}{2}''$ Strips. They are connected by two $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips at one end, and by two $2\frac{1}{2}'' \times 1''$ Double Angle Strips at the other.

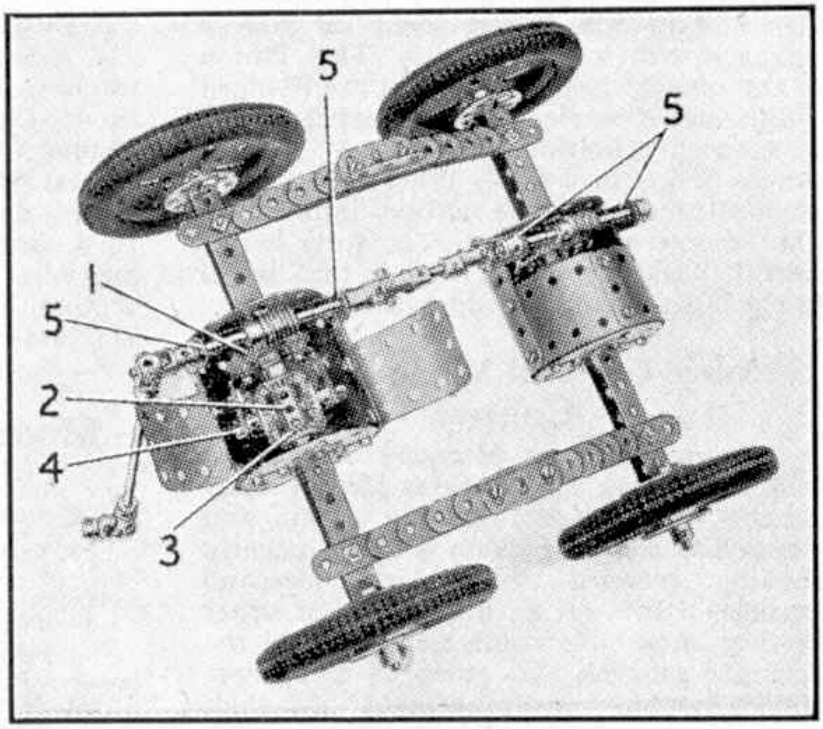

Fig. 1. A drive transmission arrangement suitable for a lorry fitted with twin rear axles.

The piston rod is attached to a Coupling 2 by a Rod Socket 3, and the Coupling is connected to a similar part by two $1''$ Rods which rest in the groove of a Socket Coupling 1. A $2\frac{1}{2}''$ Rod is passed through the Socket Coupling and is held in place by Collars. The ends of this Rod are free to move between the slide bars. At the other end the piston rod is passed through a Wheel Disc 4.

Simple Gear-Box for Cranes

Most model-builders are interested in gear-boxes as these provide so much scope for ingenuity in building them compactly from the parts available.

The gear-box shown in Fig. 3 is specially

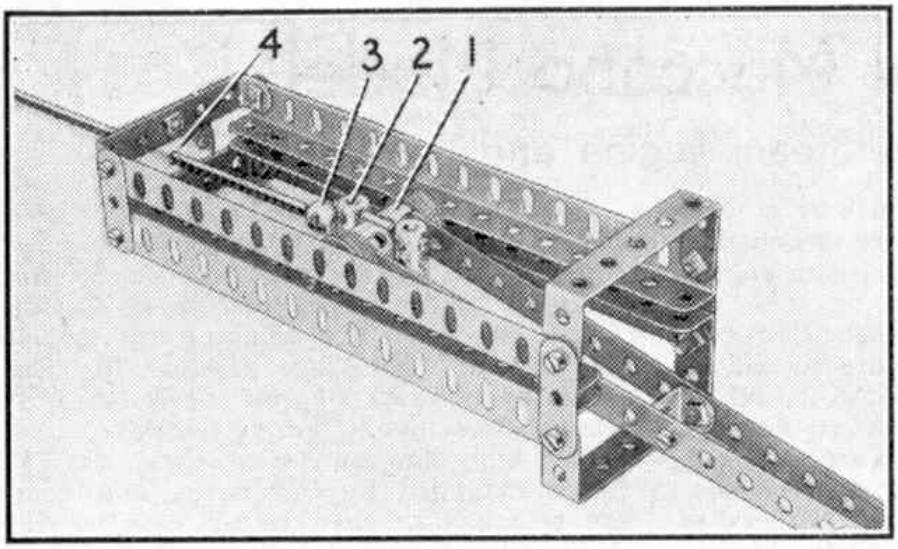

Fig. 2. One of many methods of constructing a crosshead and slide bars for a model steam engine.

designed for use in models such as mobile cranes, where a single motor mounted in the chassis is used to operate the luffing and hoisting movements as well as the movements of the crane itself. The drive to the gear-box is transmitted from the motor through a Rod mounted in the centre of the bearing that supports the crane.

The mechanism is housed in a framework formed by two $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plates and two $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plates. These are bolted to $1'' \times \frac{1}{2}''$ Angle Brackets fixed to $7\frac{1}{2}''$ Angle Girders 1, which are then attached to the sides of the crane cab. A Ball Race Flanged Disc 2 is also fixed to the Angle Girders, and forms the upper member of the crane bearing.

The input shaft is mounted in the Ball Race Flanged Disc and in a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip fixed between the sides of the framework. The shaft carries a $\frac{3}{4}''$ Contrate 3, and two $\frac{3}{4}''$ Pinions 4 are fixed on a shaft 5 so that either can be moved into mesh with the Contrate to provide forward and reverse drives. Movement of the shaft is controlled by a lever 6 that engages between a $\frac{1}{2}''$ Pulley and a Collar on shaft 5.

Rod 7 forms the hoisting drum and it carries a 1" Pulley 8 and a 50-tooth Gear 9. The Cord winds between the Pulley and the Gear. A lever 10 carries a $\frac{1}{2}''$ Bolt that engages between 1" Pulleys on Rod 7, so that by operating the lever the Gear 9 is moved into mesh with its $\frac{3}{4}''$ Pinion. A $\frac{3}{8}''$ Bolt screwed in Pulley 8 engages a Bolt in the housing when the Gear is disengaged and provides an automatic brake.

The luffing drum is identical to the hoisting drum in arrangement and operation. The levers controlling all the movements are pivoted on a common shaft 11 which is mounted in Flat Trunnions bolted to Girders 1.

Bending and Using Flexible Plates

The Flexible Plates of various sizes that are included in Meccano Outfits are very useful for filling-in purposes in built-up structures. The Plates can be bent quite easily with the fingers, but right angles should be avoided whenever possible. If a complete cylinder is required the Plate or Plates should be rolled around a wooden former of suitable diameter, or shaped gradually between the fingers, care being taken to avoid sharp angles at the edges of the Plate adjacent to the holes.

After use the Plate can be re-straightened first with the fingers, and then placed between two flat pieces of wood and tapped gently with a mallet.

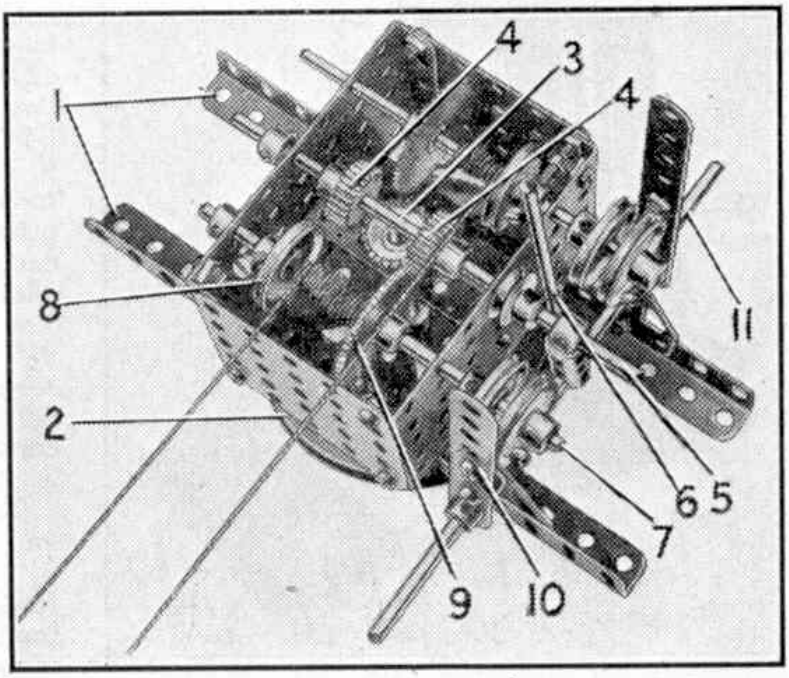

Fig. 3. A simple gear-box suitable for transmitting a drive to the chassis of a mobile crane and also operating the hoisting movements.