

Giant Walking Dragline

ONE of the larger models that attracted attention when it first appeared in the *Meccano Magazine* some years ago was the Giant Walking Dragline shown in Fig. 1. I think that it is worth while including it again for the benefit of present readers who have a good supply of Meccano parts at their disposal.

The original model was driven by the old E20R Electric Motor, but readers who have the E15R Motor can use this as a substitute.

The cab base is made by bolting three $5\frac{1}{2}'' \times 3\frac{1}{2}''$ Flat Plates between two $12\frac{1}{2}''$ Angle Girders 1. The assembly is strengthened by a $5\frac{1}{2}''$ Angle Girder at the rear, and by a similar Girder 2 (Fig. 2). A Flanged Disc from a Ball Thrust Race is bolted to the underside of the base, and the Ball Cage is carried between the Flanged Disc and a $3\frac{1}{2}''$ Gear mounted between nuts on four $\frac{3}{4}''$ Bolts that are held by nuts in a 4" Circular Plate. This Plate is bolted to two $5\frac{1}{2}''$ Strips fixed across a Circular Girder 4, and a second Circular Girder is attached to the first by Fishplates. A $1\frac{1}{2}''$ Rod fixed in the $3\frac{1}{2}''$ Gear is passed through the bearing unit, and the

Fig. 2. The dragline with the body removed to reveal the levers controlling the four-movement gear-box.

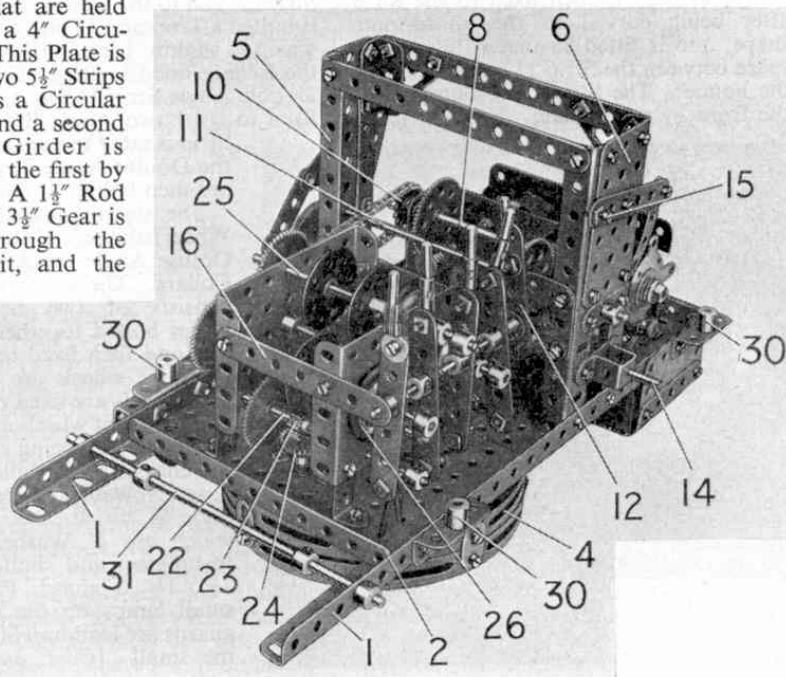


Fig. 1. This fine walking dragline, which contains some of the features of the world's largest machines of this type, provides an exciting subject for older model-builders.

cab is held in position by a Collar. The framework that carries the walking shafts consists of two columns 5 and 6. Column 5 is made by bolting a $5\frac{1}{2}''$ Angle Girder and a $5\frac{1}{2}''$ Strip to the base, and column 6 consists of two $5\frac{1}{2}''$ Angle Girders. A $3'' \times 1\frac{1}{2}''$ Flat Plate is fixed to each column, and they are connected at the top by $5\frac{1}{2}''$ Strips.

An E15R or E20R Electric Motor is bolted to the rear of the base, and a $\frac{3}{4}''$

Pinion on the armature shaft meshes with a 50-tooth Gear on a $2\frac{1}{2}''$ Rod 7 (Fig. 3). A Worm on this Rod is in constant mesh with a 57-tooth Gear on a Rod 8, which is mounted in a $1'' \times 1''$ Angle Bracket bolted to the Motor, and in a $2\frac{1}{2}''$ Flat Girder fixed to a $2\frac{1}{2}''$ Angle Girder that is also bolted to the Motor side-plate. Rod 8 carries a $\frac{1}{2}''$ Pinion 9 and a $\frac{3}{4}''$ Sprocket 10.

The drive to the walking motion is taken from Pinion 9 to a 57-tooth Gear on a $6\frac{1}{2}''$ Rod 11. This Rod is mounted in $1\frac{1}{2}''$ Strips bolted to the columns 5 and 6, and it is arranged so that it can slide about $\frac{1}{4}''$ in its bearings to bring the Gear into mesh with Pinion 9 when it is required to engage the drive. The sliding movement

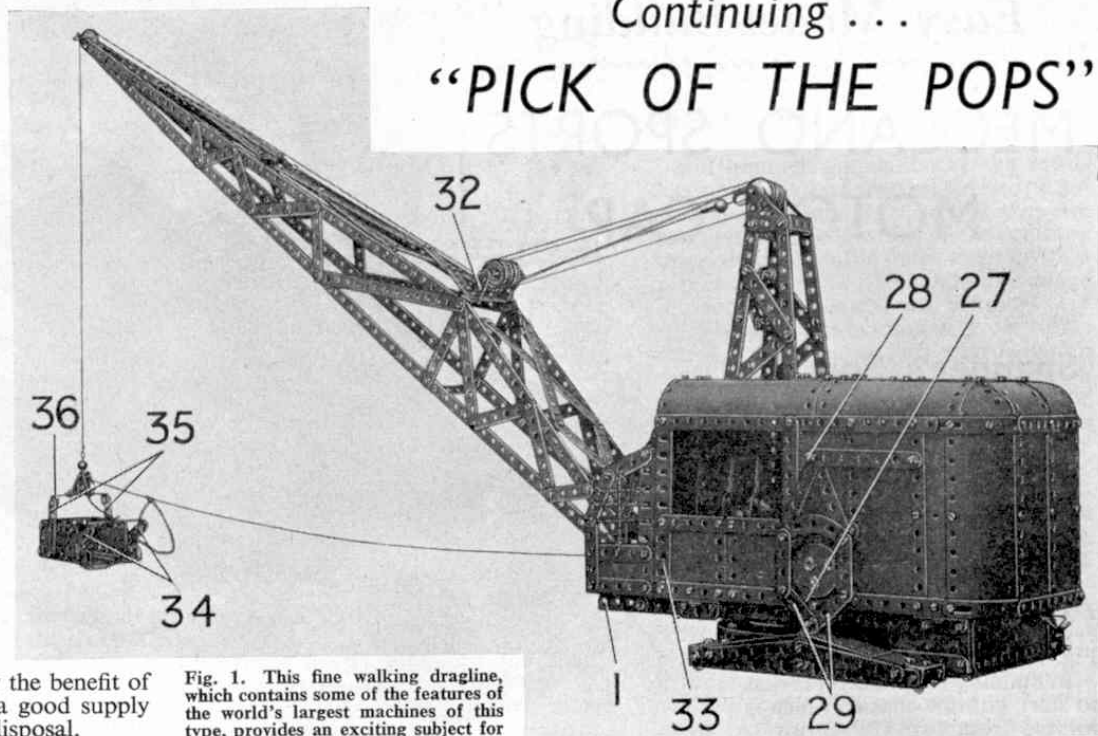
BY SPANNER

of Rod 11 is controlled by a lever 12. This consists of a Crank extended by a $2\frac{1}{2}''$ Strip and fitted with a Rod and Strip Connector, and it is fixed on a $2\frac{1}{2}''$ Rod mounted in $1\frac{1}{2}''$ Flat Girders bolted to the column 6. A Coupling on the Rod, between the Flat Girders, is fitted with a $\frac{3}{8}''$ Bolt, and the head of this Bolt engages between the boss of the 57-tooth Gear and a Collar on Rod 11. $1\frac{1}{2}''$ Pinion 13 on Rod 11 is in constant mesh with a 57-tooth Gear on the main walking shaft, which is an 8" Rod 14 mounted in $1\frac{1}{2}''$ Strips and Double Bent Strips bolted to columns 5 and 6.

The Electric Motor switch is operated by a lever 15. The gear-box (see Fig. 3) is

Continuing ...

"PICK OF THE POPS"



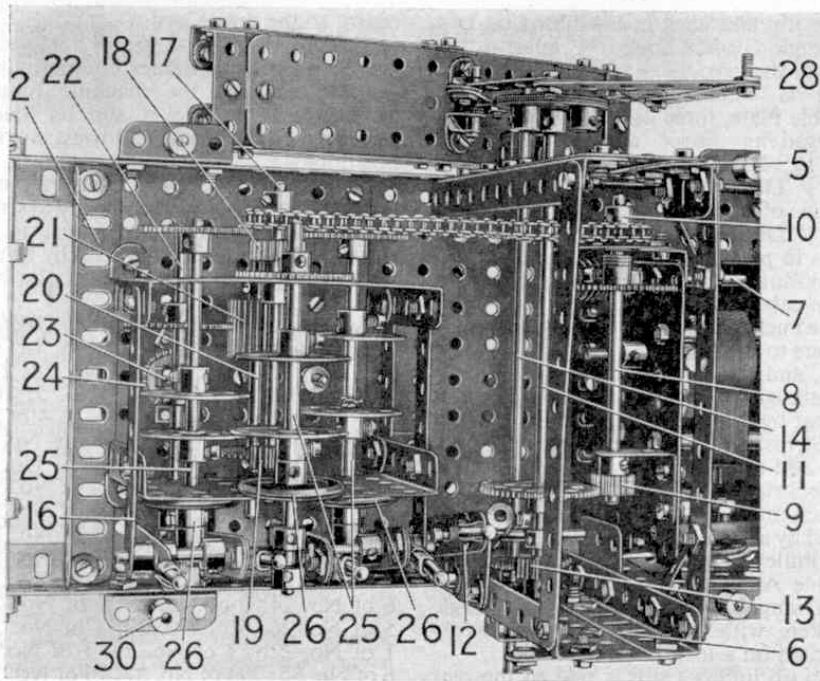


Fig. 3. An overhead view of the cab base that shows the arrangement of the winding drums in the gear-box.

made by connecting two $3\frac{1}{2} \times 2\frac{1}{2}$ " Flanged Plates together at each end by a $3\frac{1}{2}$ " Strip 16 and a $2\frac{1}{2}$ " Strip. The $2\frac{1}{2}$ " Strip is removed in Fig. 3 in order to show the gears clearly. The gear-box is attached to the cab base by two $1 \times \frac{1}{2}$ " and two 1×1 " Angle Brackets.

The drive from Sprocket 10 is taken by Chain to a $\frac{3}{4}$ " Sprocket on a Rod 17 mounted centrally in the Flanged Plates. This Rod is fitted with a $\frac{3}{4}$ " Pinion 18 and a $\frac{1}{2}$ " Pinion 19. Pinion 19 is in constant mesh with a 57-tooth Gear on a Rod 20, which carries also a $\frac{3}{4}$ " diam. $\frac{3}{4}$ " face Pinion 21. The latter engages a 50-tooth Gear on a slidable Rod 22. The $\frac{1}{2}$ " Pinion 23 is fixed on the Rod and is located centrally over a $\frac{3}{4}$ " Contrate 24. The Contrate is fixed on a 2 " Rod mounted in the cab base and in a $1\frac{1}{2}$ " Strip 25 that is attached to the base by $\frac{1}{2}$ " Bolts, so that it is located beneath the Ball Thrust Race Flanged Disc. The Contrate is spaced from the base by Washers so that it engages accurately with Pinion 23, and a $\frac{1}{2}$ " Pinion on the lower of the 2 " Rod is in constant mesh with the $3\frac{1}{2}$ " Gear 3. Pinion 23 can be engaged with either side of the Contrate to provide a reversible drive for the slewing motion.

The remaining three drives of the gear-box are each engaged by sliding a Rod 25 so that a 50-tooth Gear on the end of the Rod engages with Pinion 18. Each of the Rods 25 is fitted with a 1 " Pulley and Rubber Tyre 26, two Bush Wheels that form the winding drum, and two Collars on the outer end of the Rod.

The sliding Rods are controlled by levers formed by 3 " Strips extended by Rod and Strip Connectors. Each lever is pivoted between Collars on a Rod mounted in the end holes of Strips 16, and

carries a Bolt held by two nuts in the 3 " Strip. The bolt heads engage between the Collars at the ends of the Rods.

The lever controlling the slewing drive is held vertically by a $2\frac{1}{2}$ " Driving Band looped over a bolt in the end hole of the lever and the base of the cab. Each of the levers operating the remaining three sliding shafts has a $2\frac{1}{2}$ " Driving Band looped between the gear-box and a bolt in the lever, so that it forces the Rubber Ring on the Pulley against the side of the

gear-box to act as a brake. First movement of the lever releases the brake and its Rod is free to rotate, but further movement brings the 50-tooth Gear into mesh with Pinion 18 to engage the drive.

Each walking shoe consists of two $7\frac{1}{2}$ " Angle Girders joined at their ends and at the centre by $1\frac{1}{2} \times \frac{1}{2}$ " Double Angle Strips. The central Double Angle Strip is connected to the Girders by Fishplates and $3\frac{1}{2}$ " Strips, and the shoe is completed by two $5\frac{1}{2} \times 1\frac{1}{2}$ " Flexible Plates attached to Fishplates bolted to the end Double Angle Strips. The shoes are operated by Triple Throw Eccentrics fixed to the ends of Rod 14. A $2\frac{1}{2}$ " Stepped Curved Strip 27 (Fig. 4) is bolted to the strap of each eccentric and is linked to a further curved strip by two 2 " Strips. Two 3 " Strips are connected at their upper ends by a $\frac{3}{8}$ " Bolt 28, and two 2 " Slotted Strips 29 are arranged so that a 1 " Rod can be passed through their end holes and the eccentric strip and through Angle Brackets bolted to the shoe.

The cab base is completed by fitting a box at the rear to house counterbalance weights, and the body bearer brackets. The sides of the box are $2\frac{1}{2} \times 1\frac{1}{2}$ " Flexible Plates, fitted at their lower edges with $2\frac{1}{2}$ " Angle Girders, and the bottom is a $5\frac{1}{2} \times 2\frac{1}{2}$ " Flat Plate. The front is a $5\frac{1}{2}$ " Flat Girder bolted to a $5\frac{1}{2}$ " Angle Girder, and the rear is a $5\frac{1}{2} \times 1\frac{1}{2}$ " Flexible Plate. The body bearer brackets are $1\frac{1}{2}$ " Angle

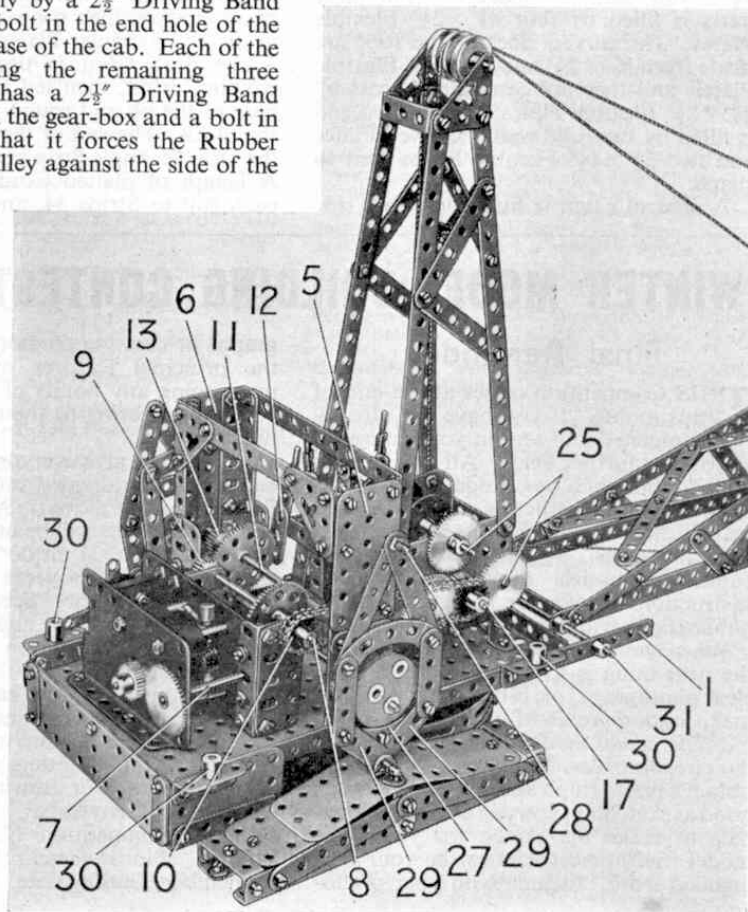


Fig. 4. The position of the E1SR or E20R Electric Motor and the construction of the walking shoe and eccentric are shown clearly in this view.

Girders and each is fitted with a Rod Socket 30.

The sides of the jib are each made from six 12½" Strips bolted together as shown in Fig. 1. A vertical 3½" Strip is fixed between the apex and the base and bracing Strips of various lengths are fitted. The sides are connected together by a Double Bracket at the jib head, by two 2½"×½" Double Angle Strips at the ends of the vertical 3½" Strips, and by a 3"×1½" Double Angle Strip at the base of the jib. The complete jib pivots between Collars on a Rod 31 seen in Fig 4. Three 1" Pulleys are mounted on a 2" Rod that passes through 1"×½" Angle Brackets 32 (Fig. 1).

The side of the cab seen in Fig. 1 is made by bolting two 9½" Strips to a 5½" Angle Girder 33. This side is filled by two 2½"×2½", one 5½"×1½" and two 5½"×2½" Flexible Plates, arranged to leave a gap to allow access to the control levers. The edges of the Plates are braced by Strips. The other side is constructed similarly, but the 2½"×2½" Plates are replaced by 5½"×2½" Flexible Plates to fill the side in completely.

A vertical 5½"×2½" Flexible Plate is attached to each of the Angle Girders 33, and these Plates are connected at their upper ends by a 2½"×2½" Flexible Plate. The front is completed by two Semi-Circular Plates and two 2½"×1½" Flexible Plates. The sides are connected at the rear by Formed Slotted Strips joined by 4½" Strips, and the space between these parts is filled by four 5½"×2½" Flexible Plates. The curved sides of the roof are made from 5½"×2½" and 4½"×2½" Flexible Plates, and they are connected across by 4½"×2½" Flexible Plates. The curved end is filled by two 1⅞" radius Curved Plates and two 2½"×1½" Flexible Plates bent to shape.

A control cabin is fitted on either side

of the jib, and each is assembled on two 4½" Angle Girders bolted 1½" apart at the front of the cab. Each side of the control cabin is assembled from a 2½"×1½" Flexible Plate, three 2½" and two 2" Strips arranged as shown, and the roof is a 2½"×1½" Flexible Plate attached to a 1½"×½" Double Angle Strip. The lower section of the front is filled by three 1½"×½" Double Angle Strips. When the cab is in position on the base a 3½" Strip is lock-nutted to each of the Bolts 28 and to the cab side.

The bucket is made by bolting 3½" Angle Girders to the edges of a 3½"×2½" Flexible Plate, and the sides are 2½"×1½" Flexible Plates edged by Strips, and connected at the rear by a 2½"×1½" Flanged Plate. Two 2½" Strips 34 are bolted tightly to the sides and are joined by a 2½"×½" Double Angle Strip. Two further 2½" Strips 35 are pivoted on lock-nutted bolts and these are linked by a 2½"×½" Double Angle Strip 36. The Pulley assembly is attached to this Double Angle Strip and consists of two 1" Triangular Plates fixed to Angle Brackets with a ½" loose Pulley freely mounted on a lock-nutted ½" Bolt.

The jib luffing Cord is tied to the rear winding drum and is led over the outer pair of Pulleys at the top of the tower and the outer ones on the jib. The end of the Cord is fitted with a small Hook and this is attached to a Fishplate on the tower. The hoisting Cord is fastened to the upper winding drum and is led round the central Pulleys in the tower and the jib, and a small Hook is then slipped over a ½" Bolt in the 1" Triangular Plates.

The drag Cord is tied to the front winding drum, then led out through the base of the jib and round the ½" Pulley in the block. The end of the Cord is tied to the Double Angle Strip between Strips 34. A length of plaited Cord is fastened at each end to Strips 34, and is tied at the

centre to the drag Cord.

The box at the rear of the base should be filled with suitable counterbalance weights, so that the machine remains stable when the bucket and its load is hoisted with the jib in its lowest working position.

The walking motion of the dragline is arranged so that the machine always steps backwards. Steering and travel in the reverse direction, are controlled by turning the cab and jib bodily on the circular base.

Parts required to build the model Walking Dragline: 12 of No. 1; 6 of No. 1a; 6 of No. 1b; 14 of No. 2; 10 of No. 2a; 23 of No. 3; 20 of No. 4; 37 of No. 5; 16 of No. 6; 9 of No. 6a; 2 of No. 8; 4 of No. 8b; 8 of No. 9; 5 of No. 9a; 3 of No. 9d; 5 of No. 9f; 13 of No. 10; 1 of No. 11; 22 of No. 12; 3 of No. 12a; 4 of No. 12b; 1 of No. 13a; 2 of No. 14; 4 of No. 15a; 3 of No. 15b; 1 of No. 16; 3 of No. 16a; 1 of No. 17; 3 of No. 18a; 7 of No. 18b; 9 of No. 22; 1 of No. 22a; 1 of No. 23; 6 of No. 24; 2 of No. 25; 1 of No. 25b; 5 of No. 26; 5 of No. 27; 4 of No. 27a; 1 of No. 27b; 1 of No. 29; 1 of No. 32; 6 of No. 35; 394 of No. 37; 70 of No. 37a; 112 of No. 38; 2 of No. 40; 2 of No. 45; 1 of No. 47a; 18 of No. 48; 4 of No. 48a; 1 of No. 51; 3 of No. 52a; 2 of No. 53; 4 of No. 55a; 2 of No. 57c; 26 of No. 59; 1 of No. 62; 1 of No. 63; 4 of No. 64; 1 of No. 70; 2 of No. 73; 2 of No. 77; 4 of No. 90a; 1 of No. 94; 2 of No. 96a; 1 of No. 103; 1 of No. 103f; 2 of No. 103h; 5 of No. 111; 5 of No. 111a; 19 of No. 111c; 2 of No. 130; 4 of No. 133; 2 of No. 143; 1 of No. 146a; 3 of No. 155; 1 of No. 168a; 1 of No. 168c; 4 of No. 186; 15 of No. 188; 8 of No. 189; 3 of No. 190; 3 of No. 190a; 5 of No. 191; 11 of No. 192; 2 of No. 200; 5 of No. 212; 2 of No. 214; 4 of No. 215; 1 E15R or E20R Electric Motor.

WINTER MODEL-BUILDING CONTEST No. 2

Final Reminder

THIS Competition closes at the end of this month. If you have not already completed and sent in your entry, do so without further delay. All you have to do is to think of a new model and then set to work to construct it, as neatly and realistically as possible, from standard Meccano parts. Models that are merely copies of models shown in Meccano Instruction Books or other Meccano publications will not be eligible.

When you have completed your model the next thing is to obtain either a good clear photograph, or, if this is not possible, make a good sketch of it, and send this to us. *The actual model must not be sent in any circumstances.* However, if you cannot obtain a photograph and you are not much good at sketching, you can ask one of your pals to make the sketch for you. The model itself, however, must be your own unaided work. Include with your photo-

graphs or drawings a short description of the principal features of your model, mentioning any points of special interest you wish to bring to the attention of the judges.

In order to give everyone a fair chance entries will be divided into two separate Sections as follows: Section A, for competitors who will be under 14 years of age on March 31 next; Section B, for competitors aged 14 years or over on that date. In each of these Sections a separate set of prizes will be awarded, and full details of these are given in the panel in the next column.

Before posting your entry write your age, name and address, and the letter A or B, indicating the Section in which you are entering, in block letters on the back of each photograph or drawing. You should address your envelope: "Winter Model-Building Competition No. 2, Meccano Limited, Binns Road, Liverpool 13". Remember: Closing date, March 31, 1962.

THE PRIZES

The following prizes will be awarded in each Section of the Competition:

SECTION A

(Competitors under 14 years of age on March 31 next)

First Prize Cheque for £5.5.0
Second Prize Cheque for £3.3.0
Third Prize Cheque for £2.2.0
Ten Prizes each of 10/6

Certificates of Merit also will be awarded in this Section to those competitors whose entries just fail to reach prize-winning standard.

SECTION B

(Competitors who will be aged 14 or over on March 31 next)

First Prize Cheque for £7.7.0
Second Prize Cheque for £5.5.0
Third Prize Cheque for £3.3.0
Ten Prizes each of £1.1.0