

Fig. 1. An attractive Funicular Railway that is great fun to build and operate.

## Funicular Railway

THE model of the Funicular Railway illustrated this month is an extremely attractive one to build and operate. It is based on one of the cliff railways that are installed at some holiday resorts where provision has to be made for carrying holiday-makers from the top of high cliffs down to the shore—and

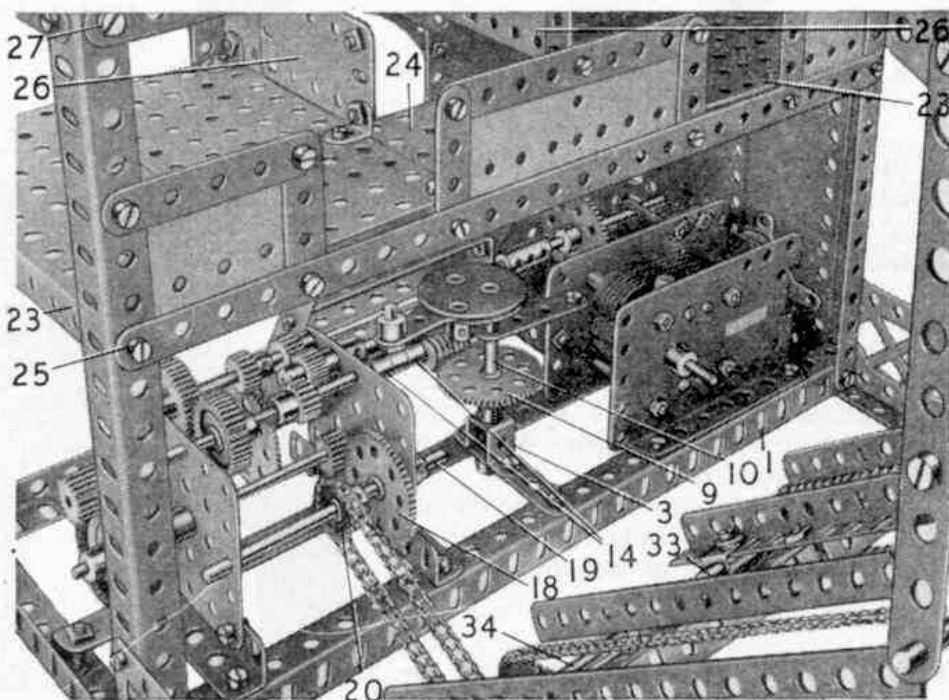
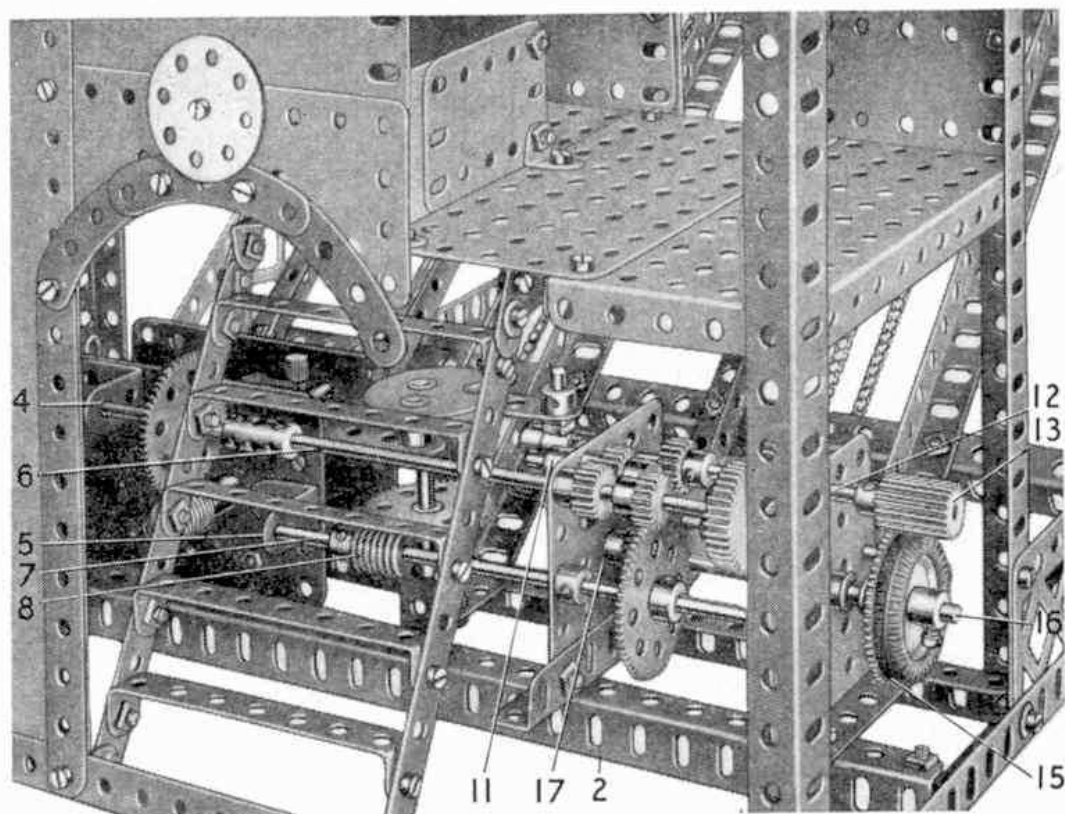


Fig. 2. A view of the automatic reversing mechanism and Motor.

Fig. 3. The reversing mechanism seen from the front.

for bringing them back again! Somewhat similar types of cliff railways to that represented in our model are to be seen in service at Bournemouth and at Babacombe Beach, Torquay.

The Meccano model consists of two passenger cars, each of which runs on a separate set of inclined rails leading from the lower platform to the upper platform. Each car is attached to a hauling cable, and one ascends while the other is making the downward trip. The cars are automatically reversed when they arrive at the platforms, an operation that is carried out by means of an



ingeniously designed automatic reversing mechanism. This mechanism will provide plenty of interest for the model-builder. The motive power is provided by an E20R(S) Electric Motor.

Full constructional details of the Funicular Railway, together with a list of the parts required to build it, can be obtained by Home readers by writing to the Editor, enclosing a 2d. stamp for postage. Overseas readers in Canada, Australia, New Zealand, South Africa, Ceylon, Italy, Rhodesia and the United States of America should write to the main agents in those countries for their copies of the current "Model of the Month" instructions, enclosing suitable stamps for postage.

We advise readers to apply as soon as possible.

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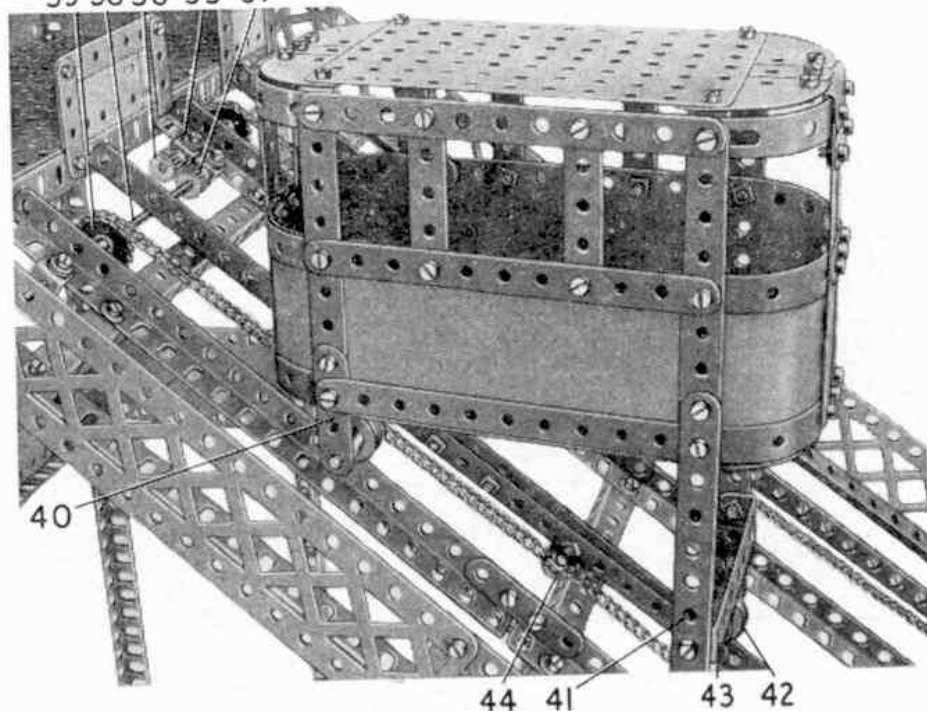


Fig. 4. One of the two passenger cars, showing method of attachment to the hauling chain.

FUNICULAR RAILWAY

Illustrated in the March 1958 issue of the "N.M."

The Power and Reverse Unit

The E20R(S) Motor is bolted on the 12 $\frac{1}{2}$ " Angle Girders 1 and 2. A 2 $\frac{1}{2}$ " Strip, with a Double Bent Strip 3 attached, is fixed in position. Two 3 $\frac{1}{2}$ " Angle Girders and 2 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ " Flat Plates are bolted to the Angle Girders 1 and 2 as shown. A 1" x 1" Angle Bracket is fixed to the Motor side, and another similar part 5 in the front of the armature shaft. A Worm Wheel is then fixed on the Motor shaft. A 6 $\frac{1}{2}$ " Rod 6 is joined to a 3" Rod to which a 57-tooth Gear Wheel is fixed. Two  $\frac{1}{2}$ " Pinions and a 1" Gear Wheel are fixed on the 6 $\frac{1}{2}$ " Rod 6, between the Flat Plates as shown. Now place a 6 $\frac{1}{2}$ " Rod 7 journalled in the 1" x 1" Angle Bracket 5 and the Flat Plate. A 57-tooth Gear Wheel takes the drive from the  $\frac{1}{2}$ " Pinion, and a Worm Wheel 8 drives a Gear Wheel 9 on Rod 10, which is mounted in the Double Bent Strip 3, and is held in position by Collars. A Triple Throw Eccentric is fixed to the top of the Rod 10. A 2" Strip attached to the Motor side-plate with an Angle Bracket, acts as the upper bearing. Now bolt a Crank 11 to the outside of the 2 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ " Flat Plate and secure a 1 $\frac{1}{2}$ " Rod, on which is placed a loose  $\frac{1}{2}$ " Pinion, held with a Collar against the Plate. A 5" Rod 12 has a  $\frac{1}{2}$ " x  $\frac{3}{4}$ " Pinion 13 mounted on its outer end, and a 1" Gear Wheel and a  $\frac{1}{2}$ " Pinion between the Flat Plates. Two fixed Collars 14 locate between them a loose Collar with a Threaded Pin. A Collar is used to hold the Eccentric strap on the Threaded Pin. The Pinion 13 drives a 57-tooth Gear Wheel 15 loose on a 4 $\frac{1}{2}$ " Rod 16 and a  $\frac{1}{2}$ " Pinion 17 drives the 57-tooth Gear Wheel 18 on a 3 $\frac{1}{2}$ " Rod 19, which has a  $\frac{3}{4}$ " Sprocket Wheel fixed to it. The positions of the  $\frac{1}{2}$ " Pinion and 1" Gear Wheel on Rod 12 must be adjusted so as to give a similar number of revolutions in each direction.

Lower Station and Platform

Four 9 $\frac{1}{2}$ " Angle Girders 21 are bolted to two 24 $\frac{1}{2}$ " Angle Girders 22 and then the Motor and the automatic reverse mechanism are placed in position. Subsequently the sides are filled in with 9 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ " Strip Plates. The front entrance building is made from four 9 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ " Strip Plates, a 4 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ " Flexible Plate, two 2" x 2 $\frac{1}{2}$ " Triangular Flexible Plates, and a Wheel Disc. The entrance doorway is edged off with 5 $\frac{1}{2}$ " Strips and 2 $\frac{1}{2}$ " Curved Strips arranged as shown.

The entry platform consists of two 5 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ " Flanged Plates 23 at either end and these are bolted to a 5 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ " Flat Plate. Another 5 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ " Flanged Plate 24 is fixed in the centre. A 12 $\frac{1}{2}$ " Strip 25 supports the barrier, which consists of 2 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " Flexible Plates and Strips. Two more 2 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " Flexible Plates 26 are fixed in place using Angle Brackets and Strips for the purpose. A 12 $\frac{1}{2}$ " Strip 27 supports the roof, which is built from 12 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ " Strip Plates, with a 12 $\frac{1}{2}$ " Angle Girder forming the apex. The roof ends are filled in with 2" x 2 $\frac{1}{2}$ " Triangular Flexible Plates, and a 2" Slotted Strip, extended with a 1 $\frac{1}{2}$ " Strip. The sides of the steps leading to the platform are made from two 5 $\frac{1}{2}$ " Strips each extended by a 2" Slotted Strip and joined across with 3 $\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strips. The ladder is attached to the framework and the platform by means of Angle Brackets.

Upper Landing Platform and the Base

The Angle Girders 22 are lengthened by 18 $\frac{1}{2}$ " Angle Girders 28 overlapped seven holes. Four 24 $\frac{1}{2}$ " Angle Girders 29 are bolted to those Angle Girders and are braced in the centre with two 5 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ " Flexible Plates and one 12 $\frac{1}{2}$ " Strip Plate, which are edged with 5 $\frac{1}{2}$ " and 12 $\frac{1}{2}$ " Strips and Angle Girders.

The upper platform is built up from four 5 $\frac{1}{2}$ " x 3 $\frac{1}{2}$ " Flat Plates bolted



to two  $5\frac{1}{2}$ " Angle Girders 30 and  $12\frac{1}{2}$ " Angle Girders 31. The sides and back are filled in with Flexible Plates of suitable size. The roof and barriers are similar to those of the lower platform.

#### The Rails and Sides of the Runway.

For each side of the runway a  $12\frac{1}{2}$ " Angle Girder and a  $24\frac{1}{2}$ " Angle Girder are joined together, overlapping six holes. To these two  $12\frac{1}{2}$ " and one  $9\frac{1}{2}$ " Braced Girder are bolted. The runway is supported by a 2",  $7\frac{1}{2}$ " and a 14" compound Strip on each side. These are bolted at their lower ends to Girders 22. The lower end of the runway is fastened to the Angle Girder 21 by a  $2\frac{1}{2}$ " Braced Girder, and a  $1\frac{1}{2}$ " Strip holds the Braced Girder at the top to Angle Girder 29. Each of the runway sides is similar in construction and they are connected together with four  $12\frac{1}{2}$ " Angle Girders 32. Each of the carriage rails is made from a  $24\frac{1}{2}$ " Angle Girder joined to a  $9\frac{1}{2}$ " by a 2" Strip, and the rail is bolted to the Angle Girders 32. Two Angle Brackets 33 are bolted in the third hole from the bottom of each rail. A Rod with a 1" Sprocket Wheel on it is mounted in the Angle Brackets 33.

The Sprocket Wheel 20 drives a  $\frac{3}{4}$ " Sprocket Wheel on Rod 34. Two Angle Brackets are bolted in the second hole from the top of the rail and on a Rod journalled in these a  $\frac{1}{2}$ " Pinion 36 and a 1" Sprocket Wheel are fixed. A  $6\frac{1}{2}$ " Rod 38 carries a 1" Sprocket 39 and a  $\frac{1}{2}$ " Pinion 37, which engages with Pinion 36. Endless chains are placed over the Sprocket Wheels at the upper and lower ends of the rails.

#### The Cars

The roof and floor of the cars are alike, and are built from one  $5\frac{1}{2}$ " x  $3\frac{1}{2}$ " Flat Plate, a  $7\frac{1}{2}$ " Strip, two  $3\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strips, and four Semi-Circular Plates. The sides and ends are formed from  $5\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flexible Plates and two Curved Plates  $1\frac{11}{16}$ " radius strengthened with Strips and Formed Slotted Strips

Two 2" Strips 40 and two  $5\frac{1}{2}$ " Strips 41 form the bearings for the rail wheels 42. These wheels 42 are  $\frac{1}{2}$ " loose Pulley Wheels with  $\frac{3}{4}$ " Washers on each side and are held in place on the Rods with Collars. A  $3\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip 43 supports the Strips 41. Now bolt a 3" and a  $5\frac{1}{2}$ " Strip together, and mount it centrally on the car axles. An Angle Bracket is to be bolted in the centre of the  $5\frac{1}{2}$ " Strip. Now set the reversing mechanism so that the 1" Gear Wheels are just coming out of mesh, and then fasten one car to the bottom of the endless chain by means of a bifurcated paper clip (or a 6 B.A. bolt and nut) passed through the Angle Bracket on the  $5\frac{1}{2}$ " Strip and a link of the Sprocket Chain. Fasten the other car at the top with 6 B.A. Nuts and Bolts, put through the Angle Bracket 44 and the chain, or tie with cord. The reverse mechanism must so be adjusted as to take the cars to each platform.

Parts required to build the model Funicular Railway:- 8 of No. 1;  
5 of No. 1B; 32 of No. 2; 17 of No. 2A; 3 of No. 3; 2 of No. 4; 23 of No. 5;  
19 of No. 6; 16 of No. 6A; 12 of No. 7; 2 of No. 7A; 15 of No. 8; 8 of No. 8A;  
2 of No. 9; 2 of No. 9B; 8 of No. 9F; 21 of No. 12; 2 of No. 12A; 14 of No. 12C;  
3 of No. 14; 4 of No. 15A; 5 of No. 15B; 1 of No. 16; 2 of No. 16B; 1 of No. 18A;  
1 of No. 22; 8 of No. 23; 1 of No. 24A; 7 of No. 26; 1 of No. 26B; 5 of No. 27A;  
2 of No. 31; 2 of No. 32; 427 of No. 37A; 421 of No. 37B; 91 of No. 38; 16 of No. 38D;  
1 of No. 45; 16 of No. 48B; 2 of No. 52; 5 of No. 52A; 1 of No. 53A; 4 of No. 55A;  
42 of No. 59; 1 of No. 62; 1 of No. 63; 2 of No. 70; 2 of No. 72; 3 of No. 90;  
139 of No. 94; 4 of No. 96; 2 of No. 96A; 2 of No. 98; 4 of No. 99; 2 of No. 99A;  
2 of No. 111; 8 of No. 111C; 1 of No. 115; 1 of No. 120B; 1 of No. 130; 1 of No. 142C;  
12 of No. 188; 1 of No. 191; 10 of No. 192; 8 of No. 196; 11 of No. 197;  
8 of No. 200; 16 of No. 214; 24 of No. 215; 10 of No. 222; 1 E20R(S) Motor.