

MECCANO

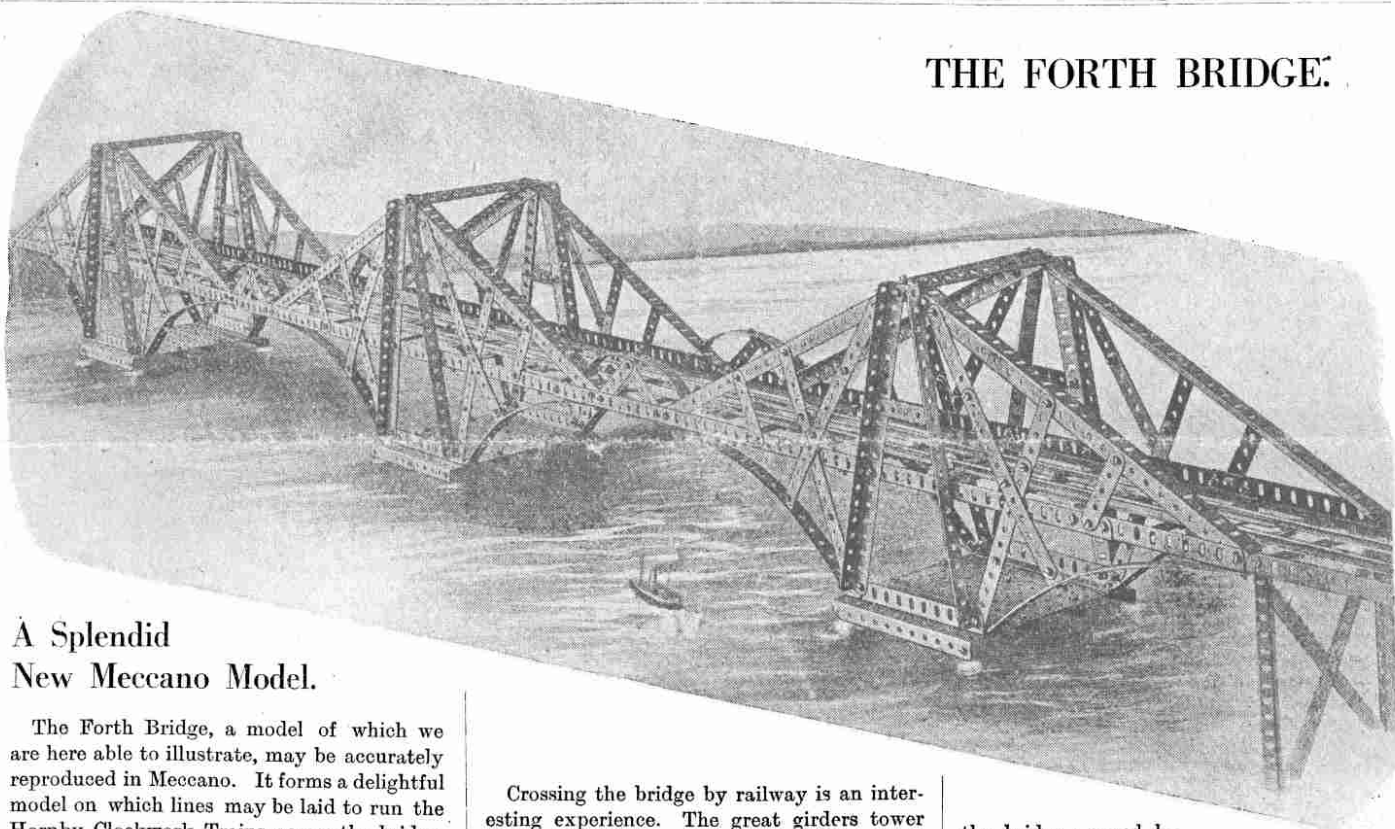
MAGAZINE

PRICE

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TO HELP MECCANO BOYS TO HAVE MORE
FUN THAN OTHER BOYS.

THE FORTH BRIDGE.



A Splendid New Meccano Model.

The Forth Bridge, a model of which we are here able to illustrate, may be accurately reproduced in Meccano. It forms a delightful model on which lines may be laid to run the Hornby Clockwork Trains across the bridge. It is easy to build by means of the full instructions contained in the new No. 3 Manual. We feel sure that all Meccano boys will be interested in the following details of this famous bridge.

The Forth Bridge has been described as being one of the greatest achievements in the history of engineering. The bridge spans the Firth of Forth and carries the main line from Edinburgh to the North of Scotland.

It is constructed on the cantilever principle and rests upon three groups of supports or columns of masonry, standing firmly on the river bed. The engineers had to bear in mind that they must allow for the free passage of shipping on the waters of the Forth, which carries a vast amount of traffic, and so the railway track is 150ft. above the river, thus allowing sufficient space for even the largest ships to pass freely beneath.

Crossing the bridge by railway is an interesting experience. The great girders tower high above, and with a hollow rumbling roar and a continual clanking, the train runs across the bridge. Far beneath one sees the waters of the Forth, perhaps with a line of warships putting to sea from Rosyth. The river is here over a mile in width, necessitating three cantilevers, each with two arms 680ft. in length. The two suspended girders are 350ft. long.

In this bridge all the members that have to stand compression are tubular; those in tension are lattice-work girders. The tubes are built of plates riveted together, the largest being 12ft. in diameter, in the manufacture of which over 40,000,000 steel plates, requiring $6\frac{1}{2}$ million rivets, were used. The bridge contains over 50,000 tons of steel. The work of building the bridge was commenced in 1883 and continued uninterrupted for seven years, some 4,000 workmen being employed. It was finally completed, and

the bridge opened by the Prince of Wales, on March 8, 1890, to the accompaniment of the music of a gale which whistled through the steel-work.

Sir Benjamin Baker, the engineer, stated that the bridge is so strong that a battleship could be hung on the end of each cantilever arm without causing the ties at the top of the piers to part. The bridge is painted once every three years, and as there are 145 acres of surface to cover, this is no light task.

We know that when heated, metal expands, and due allowance is made for this expansion in railway lines as well as in other metal structures. In the case of the Forth Bridge the total contraction and expansion allowed for, due to changes in the atmosphere, is between 6ft. and 7ft.