

Trolley Bus in Meccano

A British Industries Fair Exhibit

SINCE the War increasing attention has been paid to trolley buses, that is vehicles which derive their motive power from electric current collected from overhead wires, but do not run on a fixed rail track. As compared with the tramcar, the trolley bus scores by reason of its flexibility, which is almost equal to that of the petrol bus. It is capable of a deviation of about 15 ft. to either side from the centre of its trolley wires, and thus is able to load and unload its passengers at the kerb instead of in the middle of the road. In many respects it is a more comfortable vehicle than either the tramcar or the petrol bus.

The photograph on this page shows a fine model trolley bus built by Meccano Ltd., to the order of the Whitecross Co. Ltd., of Warrington, the well-known makers of overhead trolley wire for trams and buses. The model formed a notable feature of the Whitecross Company's display at the Heavy Section of the British Industries Fair at Birmingham in May last, where it attracted widespread attention and admiration. The current supply available for running the model was alternating current at 230 volts. It was not considered desirable to use this high-voltage current for the overhead wire supply, and therefore it was transformed down to 20 volts. On the other hand, it was found advisable to use a high-voltage motor for driving the bus, and therefore the 20-volt supply from the overhead wires was re-transformed before reaching this motor. The transformers employed were Meccano products.

The model is not controlled in any way either for speed or steering, as such control is not necessary in the case of a demonstration model of this type. The bus runs round a circular track 9 ft. in diameter, with standards supporting the two overhead wires. A short distance from the outer edge of the track is fitted a continuous flange $\frac{1}{4}$ in. in height, against which runs the outside front wheel of the bus. The bus is set to travel in a very slightly larger circle than the track, and by means of the flange is prevented from deviating from its course.

The Electric Motor, which is mounted in two spring supports, carries a $\frac{1}{2}$ " Pinion on its armature shaft, and this drives the cardan shaft through a $1\frac{1}{2}$ " Contrate and a 3 : 1 spur gear reduction. The cardan shaft drives the rear axle through one $\frac{1}{2}$ " and one $1\frac{1}{2}$ " Bevel Gear, the large Gear being connected directly to a slip clutch mechanism. The outside pair of rear wheels are driven through this clutch, which slips when any undue strain is placed on the transmission. The inside pair of driving wheels are free to rotate on the axle, a Collar being used to retain them in place. Semi-elliptic springs are fitted to both front and rear axles.

The lower saloon floor of the model is built up from Strip Plates and Angle Girders of suitable sizes, the slope down over the rear axle being reproduced by bending the Plates slightly. The platform at the rear is secured to the lower deck by means of $1\frac{1}{2}$ " x 3" Flat Plates. This floor, which is not finally secured in place until the body work is completed, forms a base on which the remainder of the

model is built. The sides, front and rear of the lower deck consist of Strip Plates edged with Strips and Curved Strips.

The driver's compartment is isolated by means of two $5\frac{1}{2}$ " Strip Plates, and a doorway leading into the lower compartment at the rear is formed by using two $2\frac{1}{2}$ " x $2\frac{1}{2}$ " Strip Plates and $5\frac{1}{2}$ " and $2\frac{1}{2}$ " Strips. The seats have been cleverly represented by making use of the motor car seats found in Meccano Motor Car Outfit No. 2. Each of these seats is secured to the floor by means of two $1\frac{1}{2}$ " Angle Girders. The two seats nearest the door have their backs to the windows, while the remaining eight seats are arranged in a double row with a central gangway. The driver's seat is made by halving a motor car seat and supporting it on two 1 " x $\frac{1}{2}$ " Angle Brackets. The driver's cab contains, in addition to a seat, a dummy steering wheel, brake handle and master controller.

The upper deck to the model is supported on a series of Strips forming the window frames. Two of these frames, on each side, are made double thickness in order to represent the trolley-platform supports of the actual bus.

The floor of the upper deck is built, with slight modifications, in a similar manner to that of the lower deck, the most notable difference being the cut-away section for accommodating the stairs. Seating is of the central gangway type, the side on to which the stairs open having six seats. These are placed fairly close together, while the seats on the opposite side, seven in number, are spaced well apart. By this means, in actual practice the balance of the bus is not disturbed.

At this point the stairs were built-up

and fitted. The shape and small size of these necessitated the use of sheet metal for their construction, as a set of stairs of this nature built in Meccano were not sufficiently neat and in keeping with the remainder of the model. The complete roof is secured to the body of the model by means of a number of Flat Brackets.

The trolley arm frame consists essentially of two curved girders built up from a number of short Angle Girders and Curved Strips. These two members are connected together by four $7\frac{1}{2}$ " Angle Girders supporting the trolley pivot frames. Each of these pivot frames is constructed from $1\frac{1}{2}$ " Angle Girders, and one complete frame is insulated from the remainder of the model. A short Rod carried in each pivot frame has at its upper end a Coupling that is fitted in its longitudinal bore with a 2" Rod. It carries also at each side a $2\frac{1}{2}$ " large radius Curved Strip, these two Strips being fitted at their outer ends with a Coupling supporting one of the trolley arms. The inner end of each Curved Strip is fitted with a strong spring, the opposite end of which is secured to the 2" Rod already mentioned. These springs always tend to keep the trolley arm in a raised position. The trolleys consist of $\frac{1}{2}$ " Pulleys each of which is mounted in a frame built up from sheet metal.



A fine trolley bus in Meccano. It runs in a most realistic manner on current taken from overhead wires.