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A PEDAL-CYCLE SIDE-CAR

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A Pedal-cycle Side-car

Constructional Details of an Inexpensive Side-car for a Child

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THE side-car here described is of the type which is attached to a pedal cycle or tandem, and is suitable for carrying a small child. No special tools are necessary, and the work can be done by anyone who is at all "handy" and, what is more, at no great expense.

The body is made from 20 gauge aluminium sheet and is supported upon an angle iron frame by hinged brackets in front with two coil springs at the rear. The frame incorporates a flexible coupling for attachment to the cycle and carries the wheel and mudguard. It should be noted that this type of side-car is not rigidly fastened to the frame as in the case of the motor-cycle combination; the cyclist must be able to "lean" his machine in the normal way when turning and consequently a flexible connection is essential.

The first stage is the construction of the chassis frame, which is made from 1¼in. x 1¼in. x 3/32in. angle iron drilled with 3/16in. diam. holes and cold riveted with 3/16in. diam. iron rivets. The frame is composed of two rectangles, a large one incorporating the mounting brackets and coil springs which carry the body, and a smaller one to transmit the load to the wheel spindle. The illustrations show the method of construction and all the members should be marked out and drilled before any riveting is done. Although the frame is rectangular, adequate rigidity is assured by providing two rivets to each corner. For those who may be without experience in riveting, the end of the rivet should project ⅛in. through the other side before hammering over, and spreading is best accomplished by working around the edge of the rivet with fairly rapid blows of a light ball-pane hammer, and finishing off with a few harder blows in the centre to tighten up the rivet. A little practice is all that is required. It was found that ¼in.-long rivets were suitable for the frame connections and ½in. for securing the brackets.

Wheel Frame

The wheel frame is made from a continuous length of angle iron, the top flange being cut at the corners to facilitate bending, afterwards being joined up with an "L"-shaped plate overlapping each portion of the flange by 1in. and double-riveted at both ends. The end connections to the main frame are formed by cutting along the angle so as to separate the flanges, the vertical one being bent at right angles to fit along the outer member of the main frame and the top flange cranked so as to be across it. Two rivets to each flange connection are required.

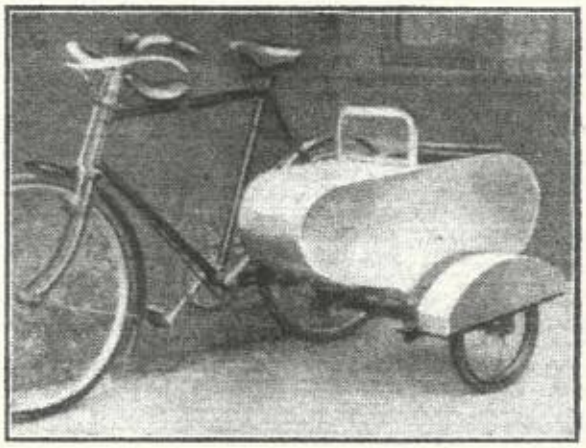
The wheel is carried between two slotted plates 3/16in. thick riveted to the frame. Incidentally, it is advisable to obtain the wheel before the construction is commenced, since different types of wheel may involve slight modification to the dimensions. The wheel actually used for this side-car was a 14in. rim with a 14in. x 1¾in. pneumatic tyre, of the type used in a child's "Junior" bicycle.

The two front brackets which support the body are made from 1¼in. x ¼in. flat mild steel, one being bent at right angles and riveted to the top flange of the outer member of the main frame, and the other riveted to the vertical flange of the inner member. They are drilled ¼in. diameter to receive the rod forming the front hinge.

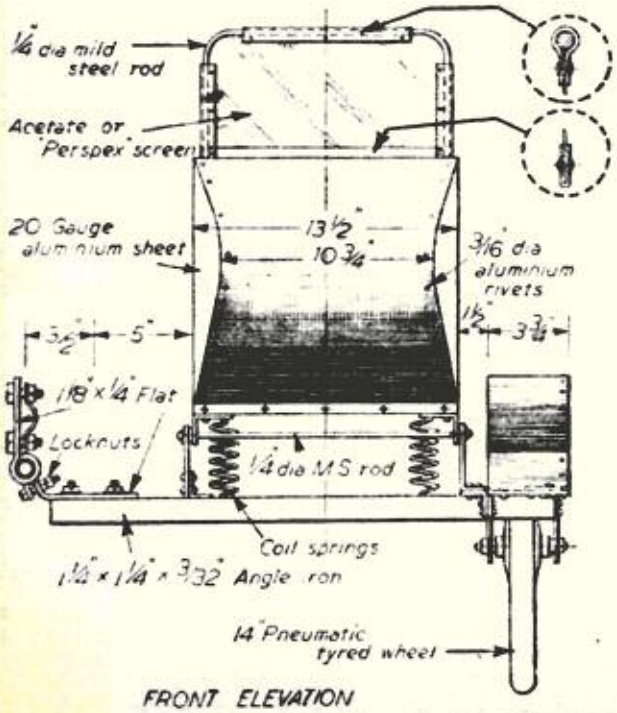
The two coil springs were obtained from a folding perambulator, each end being bent to form an eye. The lower ends were attached to the vertical flange of the rear cross member by means of ¼in. diameter iron rivets and the top eyes screwed to the wooden frame of the body.

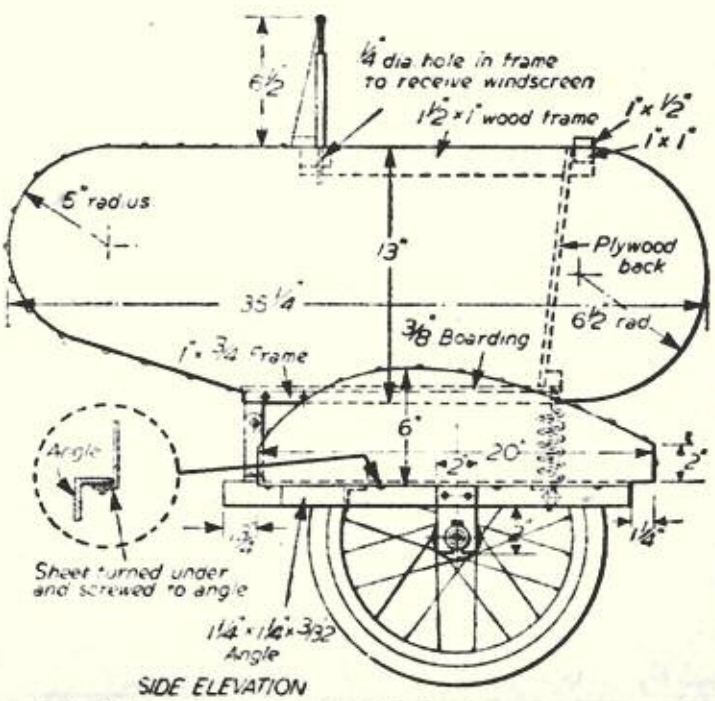
Flexible Coupling

The next stage in the construction is the flexible coupling to the cycle itself. This is attached to the lower nearside rear fork, and, since this produces a moment about the centre line of the machine, sufficient friction must be provided to overcome this, at the same time allowing freedom for the cyclist to "lean" his machine. In order to accomplish

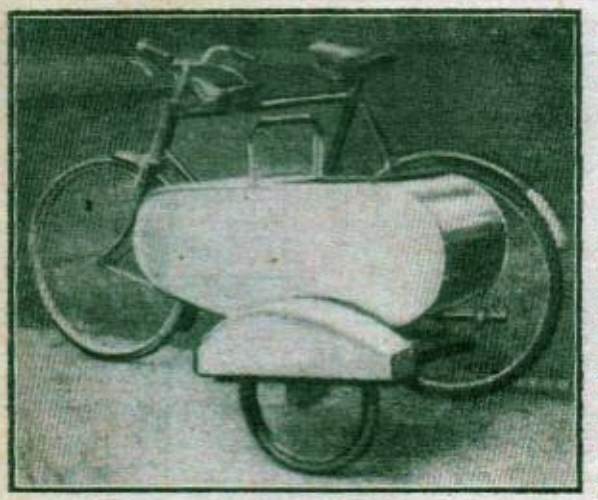


The side-car attached to a cycle (front view).





Figs. 1 and 2.—These two views of the side-car show clearly the shape of the body and method of springing.



Three-quarter rear view of the side-car and cycle.

this, a piece of 1in. diameter iron pipe was used, the attachment to the cycle being formed by two vertical brackets 1¼in. wide by ¼in. thick bent around the pipe as shown. The front bracket is provided with a fixing clip to suit the fork and two ¼in. diameter bolts and nuts, and the rear bracket is drilled to fit the projecting end of the cycle rear wheel spindle. A single rivet secures the rear bracket to the pipe.

The main frame is attached to the pipe by means of a pair of 1¼in. x ¼in. flat mild steel strips secured to the projecting ends of the cross members by two ¼in. bolts, the other ends being bent around the pipe and provided with a ¼in. bolt and locknuts for producing the correct degree of tightness.

The Body

The body is constructed as follows. First mark out the two sides leaving ¾in. extra all round for riveting and screwing to the wooden frame. Bend the riveted sections inward at right angles, nicking between rivets around the curved portions, and bend right over where the sides are screwed to the top frame. The extra ¾in. is kept flat at the bottom for fixing to the bottom frame.

The two sides are next assembled on the top and bottom frames and the front ends are drawn inwards to give a slight taper, being held temporarily with a piece of wire.

A piece of stiff packing paper is now fixed to the front of the bottom frame, and drawn round the two sides to the top frame, this enables the correct shape for the front sheet to be determined and marked out. An allowance of ¾in. must be made at the lower end for screwing to the wood frame, and also at the top edge for doubling under before fixing to the top frame. It is advisable to leave an extra inch or so at the top end as this can always be cut off at the last minute, particularly as the metal does not "give" to the same extent as the paper, and would probably be too short if cut to the exact length. Riveting is done with aluminium wire rivets; in the original, cup-headed rivets were used but flat-headed could be substituted if desired. The rivets should be about 3/16in. in length and are easily cut with a pair of wire cutting pliers. The bottom edge is screwed to the frame and each rivet position is punched, drilled and riveted up in succession. For this operation an assistant is required to hold a piece of iron or a heavy hammer to each rivet head whilst the riveter works from the inside. The back is fitted in a similar manner and on completion the edge of the metal is lightly hammered so as to fit snugly against the corners of the side pieces.

Floor, Windscreen and Mudguard

The floor is composed of ¾in. boards nailed to the lower frame, and the back is of plywood. The body is attached to the chassis by means of two brackets under the front edge of the wooden frame and a ¼in. diameter steel rod is passed through these and through the vertical brackets, the ends then being riveted over. The coil springs are secured to the rear edge of the wooden frame with substantial wood screws.

The windscreen frame is made with a ¼in. diameter mild steel rod bent to shape, and the acetate or "Perspex" sheet is secured by strips of aluminium bent around the rod and riveted through with small aluminium rivets. The ends of the frame fit into vertical holes drilled through the corners of the upper wooden frame.

The mudguard is made in a similar manner to the body and the bottom edges of the sheets are bent under the top flange of the wheel frame so that the complete mudguard can be slid on from the side. Holes for 3/16in. Whitworth screws are drilled clear in the mudguard and tapped in the frame flange, or alternatively nuts can be used on the inside.

This completes the general description of the side-car, which has functioned extremely well. The dimensions given are those of the original but can, of course, be varied to suit individual tastes and requirements.

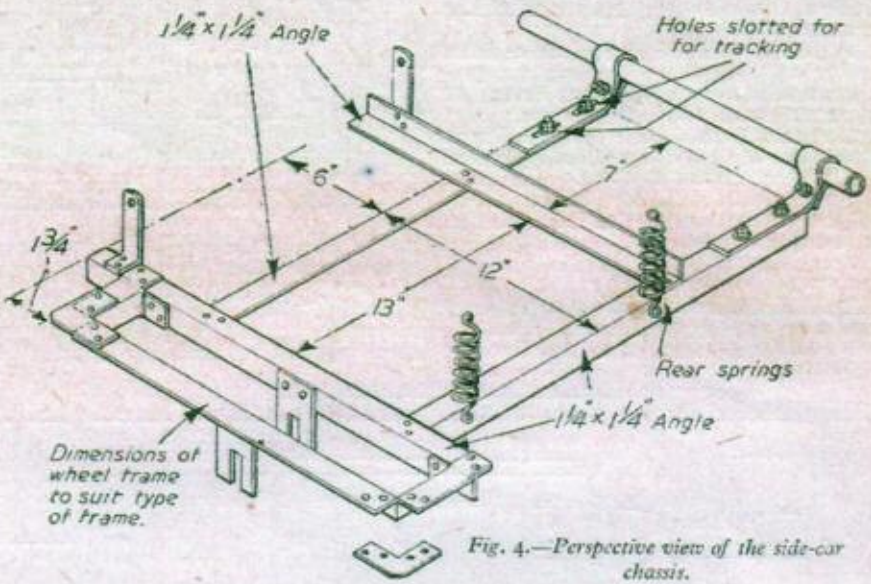


Fig. 4.—Perspective view of the side-car chassis.

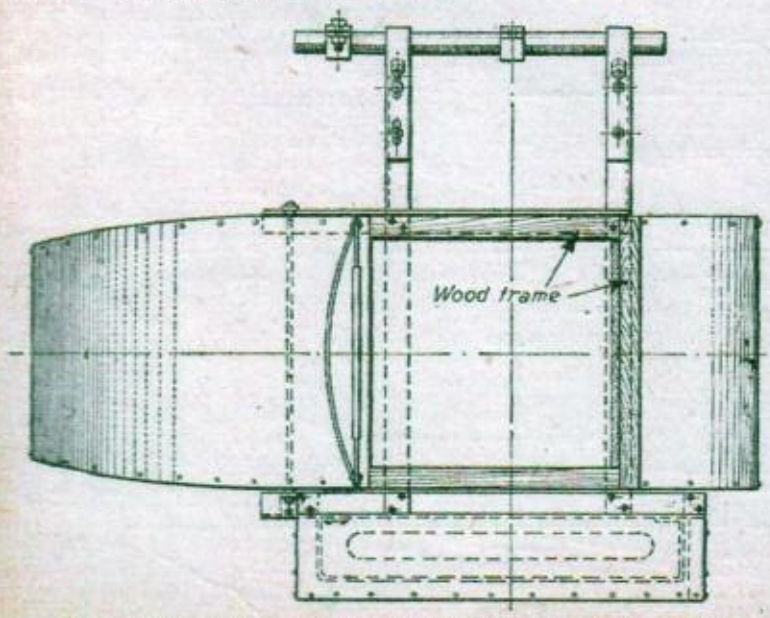


Fig. 3.—Plan of side-car. (Note: This is to the same scale as the front and side elevations.)

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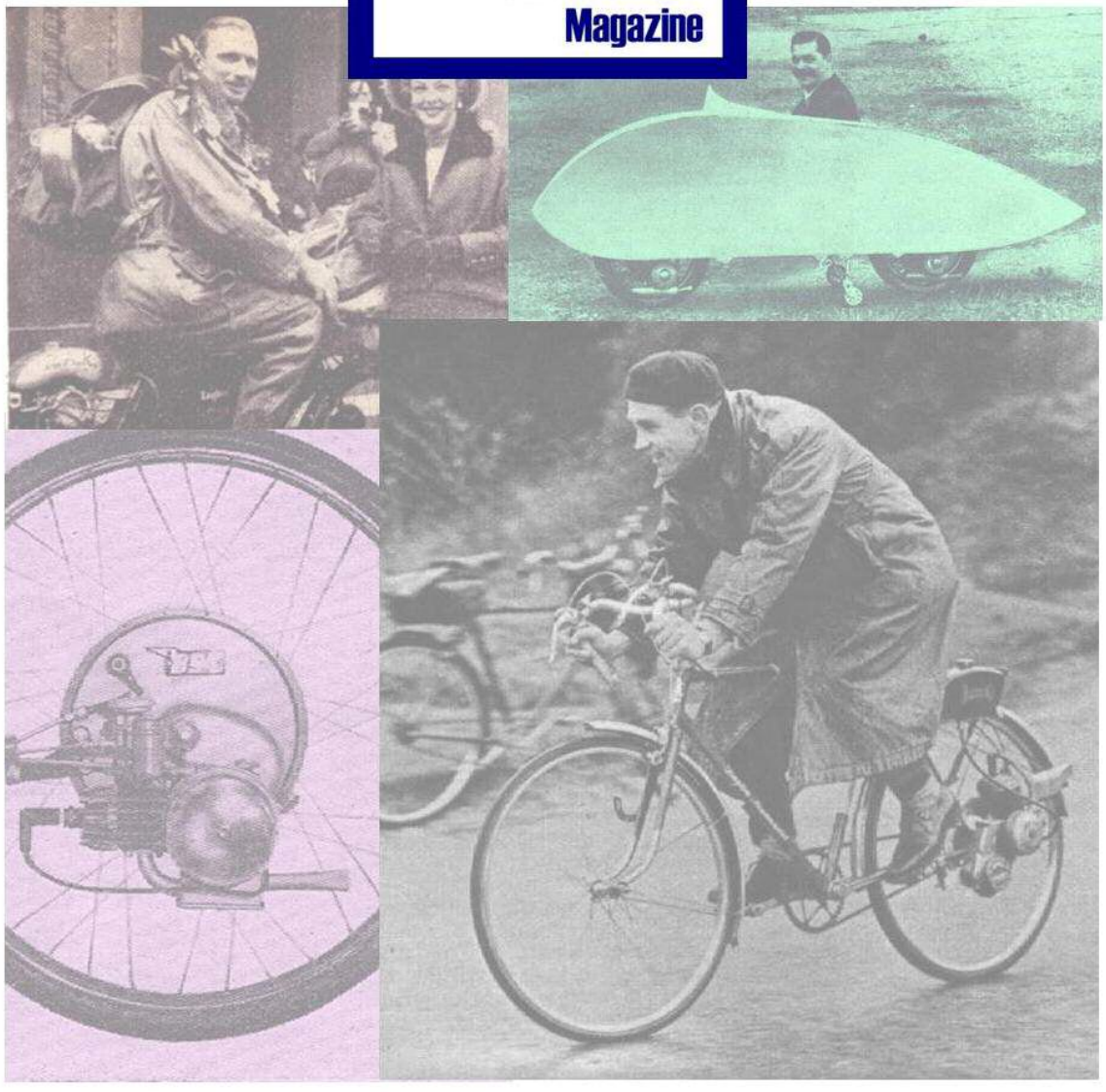

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