



Fig. 1.—A completed body on its side so as to show the unit construction of the body and frame

Automobile Body and Frame Combined in a Single Unit

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The unusual construction of the Lancia body, which involves reinforcements and a tubular sub-frame for the engine, combines a number of original features and methods

UNLIKE the general construction of automobiles where the chassis is built on which to mount the body, the Lancia design combines them both in one unit. Instead of a deep channel frame with cross members, the lower part of the body itself is so constructed as to form the frame, while the splash guard in front, the foot board, the back of the front seat and the floor construction of the rear compartment, form the cross bracing of what takes the place of the frame.

A general idea of the construction can be had from Fig. 1 which shows a completed body that it must be remembered also includes the frame. As will be seen, the body is one unit from the radiator shell at the front to the spare wheel carrier at the rear and includes rear-axle housings, which are shown in place. Details of the longitudinal bracing that takes the place of the frame will be shown later. This view, however, shows the way in which the rear flooring, the back of the front seat and the foot board form substantial cross-braces in addition to the small cross-brace in front of the forward seat.

In Fig. 2 may be seen the underside of the front end with the two tubes that form a sub-frame, that supports the engine and the transmission. These tubes are welded at each end, the rear ends being supported by formed sheet-metal brackets riveted to the steel foot board. The tubes are carefully ground to size and are located in their correct positions by a fixture that holds them while they

are being welded at each end. The importance of maintaining correct alignment of the engine and driving units necessitates great care in this part of the work, one of the last operations on the engine being to bore the supporting arms where they rest on these tubes. The depth of that portion of the frame forming the sill can be seen at *A*, while the center reinforcement can be seen at *B*. The malleable casting shown at *C* is riveted to the side for attaching the steering mechanism, which is also fastened to the tube on that side.

Starting at the beginning of the sheet metal work, we see in Fig. 3 a completed side with the door and other openings cut out. The sheet forming the side of the body is about $\frac{1}{16}$ -in. thick. The front is at the left. The sheets are cut with rotary shears as in Fig. 4, the men becoming very expert in following the outlines and handling the sheets, which they do more rapidly than might be expected.

One of the first operations is to form the back end of the sheet on the concave block shown in Fig. 5. Here the sheet is clamped to the form by the curved channel, as at *A*, utilizing projections cast on the forming block for that purpose. The other end is held in position by the hook *B*. With the sheet clamped on the block, it is flogged into the desired shape by means of a heavy mallet, working it to the curve of the cast-iron form on which it rests. Needless to say, this work requires con-