

which the width of the iron varies from  $\frac{1}{4}$  inch to 1 inch, according to the width of the rabbet to be cleaned.

**3. Miscellaneous Tools.**—A few more of the tools used by a bodymaker are shown in Fig. 3. The horizontal square (*a*) consists of a steel blade *a* set in a handle, or stock, *b*, in such a way that the latter can be turned round and set at any angle with the face of the blade, being locked in the required position by the milled nut *c*.

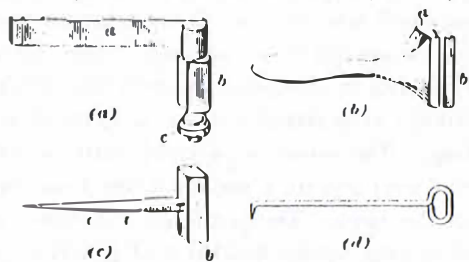


FIG. 3

The door edge-plate setter (*b*) is made of steel, with a head *a* in which is a groove, or slot, *b*. This tool is used for setting or twisting door edge-plates, the groove *b* fitting over the flange of the plate. The draw-pin (*c*) consists of a steel pin *a* fitted in a wooden handle *b*; the pin is from 6 to 9 inches in length and is about  $\frac{3}{8}$  inch in diameter at the handle, tapering off to a sharp point. This tool is used chiefly for holding mortise-and-tenon joints together temporarily when wooden pins are used to secure them, the draw-pin being pushed into one of the pin holes. The bent scriber (*d*) is made of  $\frac{3}{16}$ -inch round steel, one end being pointed and turned over

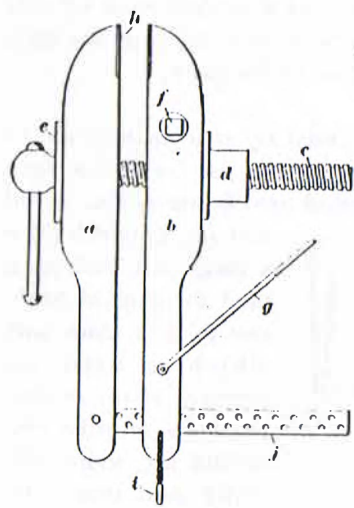


FIG. 4

at right angles. This tool is used for marking in situations where a straight scriber could not be used.

**4. End Vice.** In addition to the bench vice furnished by the employer, which is permanently secured to the bench, a similar appliance called an end vice is used; one of these is shown

in Fig. 4. As the bodymaker has to provide this he generally makes it himself. The jaws *a* and *b* are made of hard, well-seasoned ash, and are 3 to 4 inches wide. The metal screw *c* can be bought at a tool shop; these screws range from 1 inch to  $1\frac{1}{2}$  inches in diameter and may be obtained in different lengths, but the most convenient size is  $1\frac{1}{4}$  inches in diameter and 20 inches long. The screw is provided with a nut *d*, in which it works, and with a plate *e*, on which the head works; these are screwed on the jaws. The jaw *b* is secured to the back end of the bench by a long square-headed bolt *f*, which passes through a hole in the end of the bench and is secured by a nut that fits in a mortise in the wood, the bolt being tightened up by turning the head with a spanner. An iron stay *g* is screwed to the vice and bench to give steadiness. The jaws are protected against wear by thin iron plates *h*, which are let into the faces, and the jaws are kept parallel by inserting the pin *i* in holes in the bar *j*.

5. Nails and Screws. The nails used by coachmakers are of various shapes and sizes, according to the use for which they are intended; those most widely used are shown in Fig. 5, (a)

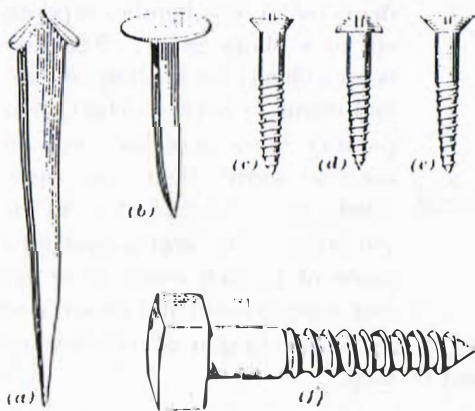


FIG. 5

and (b), in which (a) is a clasp nail, such as is used for general work, and (b) is a clout nail, which is used for securing strips of thin iron to woodwork. Screws are more generally used than nails, in bodymaking; the various types shown in Fig. 5 (c), (d), and (e) are known by the shape of the head as

raised-, round-, and flat-head screws, respectively. The large screw shown in (f) is called a coach screw and is used for heavy work, the square head being turned with a wrench or spanner.

6. Bolts and Nuts. The bolts used in bodymaking are illustrated in Fig. 6; these

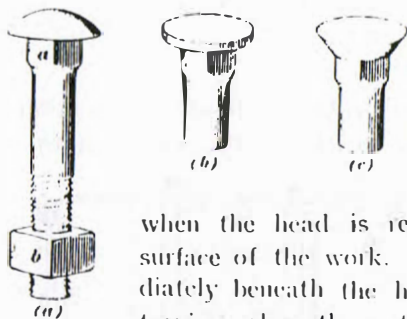


FIG. 6

also are designated by the shape of their heads. The head of (a) is called a cup head; that of (b) is a cheese head. The countersunk head (c) is used when the head is required to be flush with the surface of the work. The square portion *a* immediately beneath the head prevents the bolt from turning when the nut *b* is screwed up, after the bolt has been driven through the wood. These bolts are made in different lengths and diameters to suit requirements.

## CONSTRUCTION OF BODIES

### CLASSIFICATION OF VEHICLES

11. The term *road vehicles* is used in this Section to include all horse-drawn vehicles; these are divided into two groups, one of which is used for the conveyance of passengers and the other for the conveyance of goods. The first group is further divided into two classes, known as *private vehicles* and *public vehicles*; those in the second group are classed as commercial vehicles. Private vehicles include *broughams*, *landaus*, *phaetons*, *family buses*, *dog-carts*, *traps*, and *governess cars*; these are representative types, but the design of each varies with different makers, who sometimes give a special name to their own design of any particular type. Public vehicles comprise *cabs*, *omnibuses*, *brakes*, *ambulances*, and *funeral coaches*. Included in the commercial class are *carts*, *wagons*, *vans*, and *lorries*, or *trolleys*. The design of vehicles in this class also varies considerably, according to the bulk and weight of the materials to be carried. The names given to the vehicles described are those generally used, but it must be understood that in some districts similar names are often given to vehicles of a different type.

### DEFINITION OF TERMS

12. In the construction of bodies the various parts or members are given the same names in all classes of vehicles. For example, the term *cant-rail* would be applied to the part that occupies the same relative position in a brougham, a railway carriage, or a motor-car body. In order to illustrate the positions of these parts, a framed-up side elevation of a brougham is shown in

Fig. 11 (a) : a half-plan view of the bottom from beneath in (b) ; and a section through the door in (c). In Fig. 12 are shown a

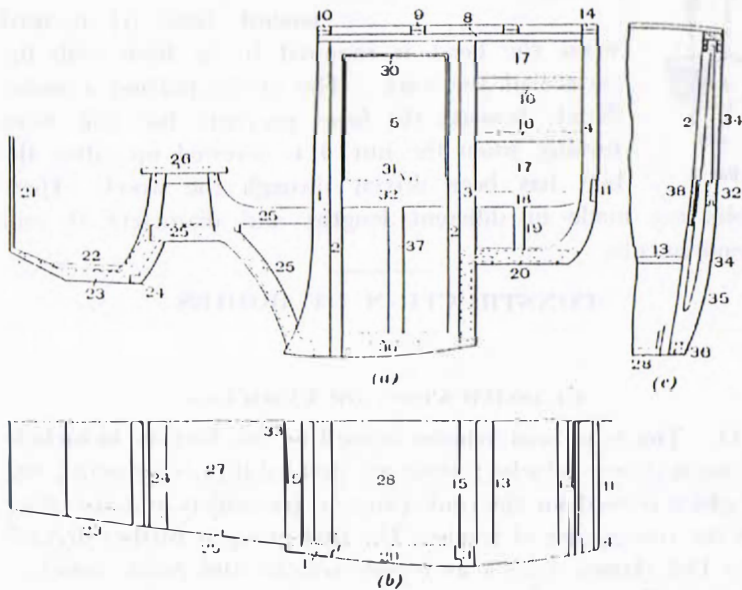


FIG. 11

half-front elevation in (a), and a half-back elevation in (b), of the same vehicle. The same reference numbers are used to indicate the same parts in both Fig. 11 and Fig. 12, and the parts numbered include all those generally used in bodymaking.

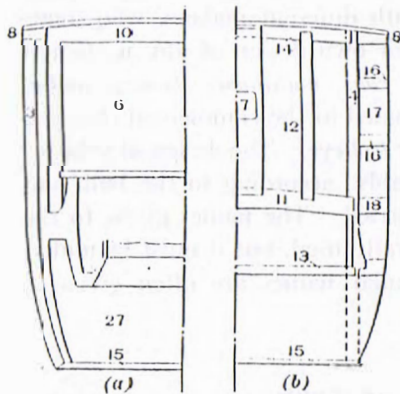


FIG. 12

**13. Names of Parts.**—Referring to Figs. 11 and 12, the various parts comprise : the front standing pillar 1, the door pillars 2, the hinge pillar 3, and the corner pillar 4 ; the side light 5, the front light 6, and the back light 7 ; the cant-rail 8, the hoop

sticks *9*, and the front arch bar *10*; the back arch rail *11*, the back upright *12*, the seat rail *13*, and the back arch bar *14*; the bottom framing *15*, the battens *16*, the quarters *17*, the elbow *18*, the side upright *19*, and the bottom side *20*; the dashboard *21*, the foot-board *22*, and the foot-board bracket *23*; the crossbar *24*, the boot framing *25*, the front seat *26*, and the boot panel *27*; the floor *28*, and the rocker *29*; the door top rail *30*, the fence plate *31*, the waist rail *32*, the front waist rail *33*, the glass run *34*, the glass-frame stop *35*, the door bottom *36*, the door upright, or batten, *37*, and the door garnish rail *38*. The body plate, which is sometimes called the body edge-plate, is indicated in dotted lines in Fig. 11 (*a*), and extends from the foot-board bracket to the bottom side.

## PUBLIC VEHICLES

### HEARSES

**75. Construction of Body.**—Hearses vary considerably in design, and generally provide more work for the carver and the glazier than for the bodymaker, owing to the amount of ornamentation. An example of this class of work is illustrated in Fig. 46, and is typical of those in general use. The bottom sides *a* are mortised to receive the ends of the front and back cross-bars, the framing being rabbeted on the inside for the flooring. The rabbets in the sides are generally made wide enough to allow the narrow side rails *b* to be fitted into them before the flooring is laid. The rails are rabbeted on the top edge for the glass sides *c*.

The bottom sides are cut back where the front pillars *d* are fitted, so that the boot side *e* can be screwed on and fitted in rabbets in the pillars. The foot-board brackets are screwed to the sides and support the foot-board *f*. The pillars *d* and *g* are tenoned into the bottom framing, the top ends being cut with a stub tenon for the cant-rail and a slot mortise for the arch bar. Both front and back arch bars are dressed straight on the bottom edge, the top edge being compassed to the form of the roof. The

cant-rails *h* are dressed on both top and bottom edges to the compass of the roof; they are then placed on the pillars and the mortises marked off, as well as the positions of the roof bars. When this has been done the pillars are taken down and sent to the carvers to be rounded and carved as required.

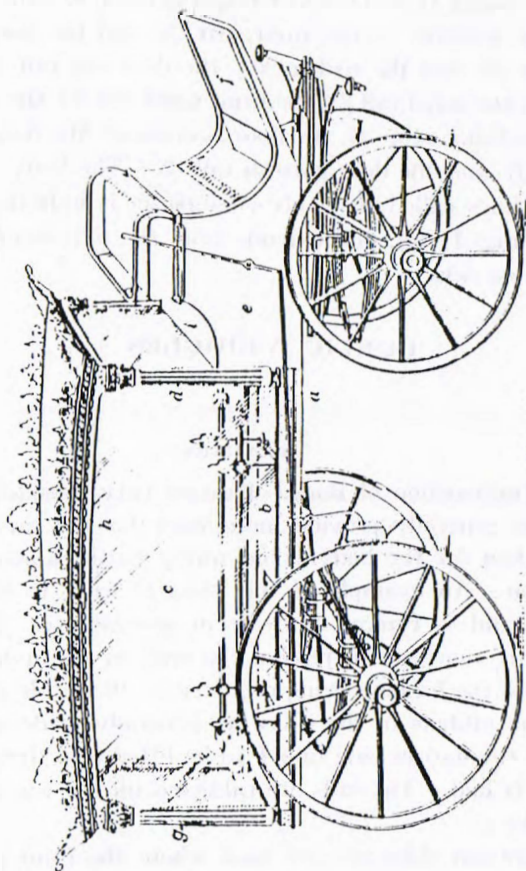


FIG. 46

76. While the pillars are being carved the cant-rails are mortised and the boot sides are prepared. The back door may also be framed up; this is a light framing having the rails fitted into slot mortises in the sides, the frame being rabbeted to receive a glass panel. The door is subsequently hung on the square edge



of one of the hind pillars with light butt hinges, and is fitted with a mortise lock.

When the pillars are returned from the carver they are fitted into the bottom sides and are secured with pins. The arch bars and the cant-rails are then put on and secured by long screws passing down into the ends of the pillars. The roof bars are dressed to the same sweep as the arch bars, and are shouldered at each end where they lap into the cant-rail.

The roof boards are tongued and grooved and are screwed down all round, as well as to the roof bars; the roof is then cleaned off to bring all the joints flush, and the corners are rounded, after which the roof is covered with moleskin. The tacked edge of the moleskins is covered with an ornamental moulding instead of the cornice moulding used for other vehicles.

77. The boot sides are screwed to the inside of the front pillars and to the bottom sides. A mahogany panel, about  $\frac{1}{4}$  inch thick, is bent and pinned on the curved portion *i*; the edges of this panel should be rounded over to form a bead. A light rail is shouldered and fitted across the boot sides to bind them together, and also to support the seat, which is screwed to the rail and to the sides. The edges of the foot-board may be beaded to improve the appearance.

78. Description of Rollers.—Iron rollers are fitted in the flooring of hearses for the purpose of sliding the coffins in and out easily; one of these rollers is shown in Fig. 47. The ends of the roller *a* are reduced at *b* to fit in the sockets, or bearings, *c*, one

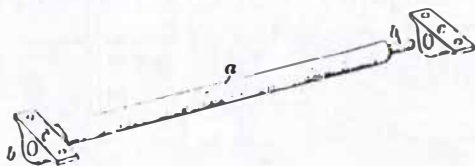


FIG. 47

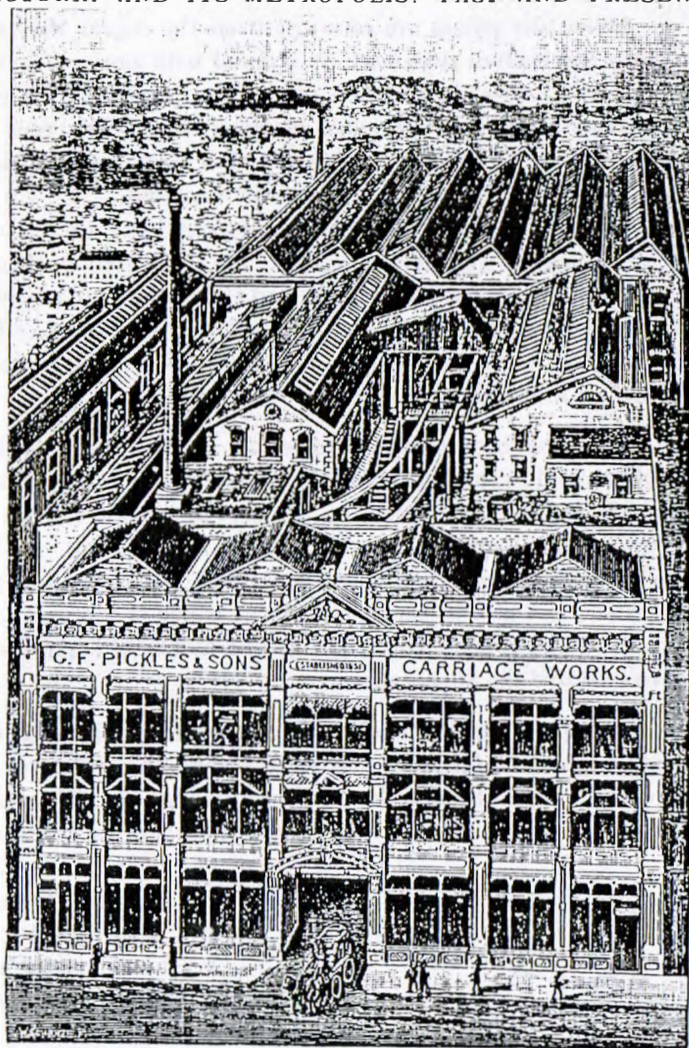
of which is shown removed; these sockets should fit close up against the shoulders of the roller to prevent it from rattling.

In some cases three of these rollers are used, but as a general rule there is only one, which is fitted close to the door and immediately in front of the back cross-bar. The sockets are let into the side framing so that the top of the roller stands  $\frac{1}{4}$  inch above the level of the flooring.

### References.

ICS Reference Library NO 75,  
Road Vehicle Bodies, undated.

*VICTORIA AND ITS METROPOLIS: PAST AND PRESENT.*



MESSRS. G. F. PICKLES AND SONS' CARRIAGE WORKS.

Pickles (G.F.) and Sons' Carriage Manufacturing Co. Ltd.

This well-known firm of coachbuilders carry on their extensive business at the premises situated at from 5 to 11 Latrobe street west, Melbourne, at Fitzroy, and also at Sandhurst. Mr G.F. Pickles, senior, was born in Halifax, Yorkshire, in 1831. He served his apprenticeship to Messrs. Hope and Co., carriage builders, of Bradford, and came to Melbourne when about twenty-two years of age. He worked for some time as a journeyman, as well as unsuccessfully trying the goldfields. After this experience he settled in