

for Spanish, also in solid work. Honduras (called Bay) wood has little artistic value, but is esteemed for the solid parts of work intended to carry veneer, being straight-grained and free from warping and shrinking. These qualities render mahogany a favourite wood in cabinet-making, another great advantage being its immunity from decay and worms.

Maple: see p. 138. The best figured birds'-eye maple is cut into veneers.

Oak: see p. 140. Oak has little beauty for furniture-making unless it is judiciously cut so as to exhibit the "champ" or silver grain to the best advantage (see p. 178). This champ is better marked in Riga than in English oak, and the former is also a more easily worked wood, consequently it is preferred for this particular purpose, though somewhat less strong and durable.

Partridge-wood: a name applied to the wood of several South American trees.

Pear: see p. 141. Takes a black stain well, and often replaces ebony.

Pine: see p. 144. The American pine, commonly called Weymouth or white pine in this country, is best suited for cabinet-making purposes, and forms the ground for nearly all veneered and hidden work.

Plane: see p. 145.

Rose: see p. 147. The best comes from Rio de Janeiro, and emits an agreeable odour. It is hard, heavy, and dark-coloured.

Sandal: chiefly esteemed for its fragrance.

Satin: see p. 147. Used in fancy articles. Has a peculiar lustre and fragrant odour.

Teak: see p. 149.

Tulip: see p. 150. Used for inlaying and marqueterie work.

Walnut: see p. 150. This wood is very popular both for solid work and veneering. The species common to Europe and Asia affords the best wood; that native of America gives a "black" kind used as a cheaper substitute. Walnut contrasts well with lighter woods, as birds'-eye maple, ash, and satinwood, and lends itself to most delicate ornamental work.

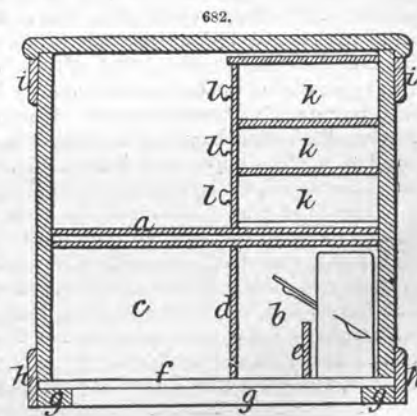
Zebra-wood: a name given to a beautiful furniture wood obtained in British Guiana from the hyawabolly (*Omphalobium Lambertii*).

In addition there are many excellent cabinet-making woods produced in our tropical colonies about which little or nothing is known in this country.

Tools.—These are mainly the same as employed in Carpentry, but some special forms are added. These will be described here, including chest and bench.

Tool-chest. A convenient chest for holding cabinet-making tools is shown in Fig. 682, as described by Cobe in *Design and Work*. It is 3 ft. 1 in., by 1 ft. 8 in., by 1 ft. 8 in. inside measurement, with a till the full length of the inside, 9 in. broad and 10½ in. deep. The body of the chest is made of ¾-in. best yellow pine, with a skirting of oak round the lid. The till and the inside of the lid are veneered with rosewood and walnut. The 2 sides are squared up 3 ft. 3 in. long and 1 ft. 8 in. broad, and the 2 ends 1 ft. 10 in. long and 1 ft. 8 in. broad.

They are previously slipped on the upper edge—that is, a thin slip of plain walnut, say ⅜ in. thick, is glued on what is to be the upper edge of each piece. These 4 pieces are dovetailed together, the dovetails 1½ in. apart



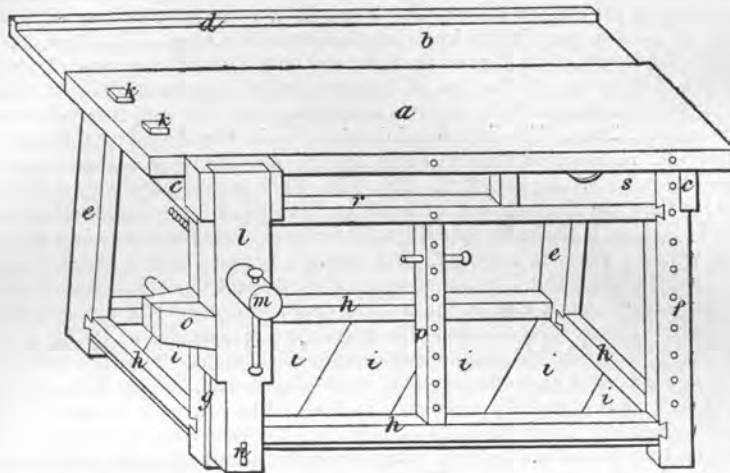
and all going quite through the thickness of the wood. Before glueing the pieces together, 2 fillets *a* of mahogany, 1 in. broad and $\frac{3}{8}$ in. thick, with a groove in the centre, are glued and screwed to the inside of the ends at a distance of $10\frac{3}{4}$ in. from the upper edge; these are to receive a sliding board 11 in. broad, which slides underneath the till, which, when pushed back, covers the planes and tools in the space *b*, and, when pulled forward, covers the tools in the space *c*. This board may well be left out. A partition board *d* between *b* and *c* comes nearly up to the sliding board, and is grooved into the 2 ends. A second partition *e* in the middle of the space *b* is 4 in. broad, and is also let into the ends. These 2 partitions are made of $\frac{1}{2}$ -in. wood, and these grooves must be made in the ends to receive them before the body is knocked together. A stain of Venetian red and ochre, with a little glue size, is made somewhat thin, and applied hot to the wood with a piece of cotton rag; then, after standing for a few minutes, as much as will come off is rubbed with another piece of rag, stroking always with the grain. In a short time this stain will dry, when it is sandpapered, using the finest. The body is next put together with thin glue, using a small brush for the dovetails, and taking care that no glue gets on to the inner surface, as taking it off afterwards leaves an unsightly mark. It must be borne in mind that in dovetailing a box such as this, the "pins" are always on the end pieces; consequently they are cut first. In "rapping" the body together, a somewhat heavy hammer is used, and always with a piece of wood to protect the work from injury. The 4 corners are glued and rapped up close. The box has to be "squared." A rod of wood, made like a wedge at one end, and applied from corner to corner diagonally inside, is the readiest method of squaring, a pencil mark being made on the side of the rod just where the side and end meet; then the rod being placed diagonally from the other 2 corners, the pencil mark will show at once whether the box is squared or not; and, if not, the *long* corner must be pressed or pushed to bring it to the square. A bottom *f* is nailed on of $\frac{5}{8}$ -in. wood, with the grain running across—i. e. from back to front. Then a band *g* of wood, $2\frac{1}{2}$ in. broad and 1 in. thick, is nailed over the bottom, and flush with the outside of the box all round. The 2 long pieces are nailed on first, and the end ones are fitted between them. To secure these bars or bands properly, a few $1\frac{1}{4}$ -in. screws should be passed through the bottom from the inside into them. The box is then planed truly on the outside all round, finishing with a hand-plane and sandpaper. A band *h* is made to go round the sides at the bottom, and another *i* at the top or upper edge; that at the bottom is $3\frac{3}{4}$ in. broad and $\frac{5}{8}$ in. thick, and that at the top $2\frac{1}{2}$ in. broad and $\frac{5}{8}$ in. thick. It makes the best job to dovetail these bands at the corners, making them of a size to slip exactly on to the body of the chest. The upper edge of the bottom band, and the lower edge of the upper, are moulded either with an "ogee" or "quarter round." When the bottom band is in a position for nailing, it covers the bottom bars and the edge of the bottom, coming up the sides of the box about 2 in. The upper band is fixed $\frac{3}{8}$ in. below the edge of the body; this forms a check for the lid, the bottling for the lid being made to check down on this band. The lid is made of pine, $\frac{7}{8}$ in. or 1 in. thick; it has cross ends, $2\frac{1}{2}$ in. broad, mortised on. These prevent the lid splitting or warping. After they are glued and cramped on, the lid is evenly planed and squared to the proper size, which is $\frac{1}{16}$ in. larger than the body of the box on front and ends, and $\frac{1}{4}$ in. over the back. The lid is fitted with 3 brass butt hinges 3 in. long. The lid, being temporarily fitted, is taken off, and a skirting put round it—that is, on front and ends. This skirting is $1\frac{1}{2}$ in. broad, and $\frac{3}{4}$ in. thick, of hard wood—oak or black birch. To make a first-rate job of this skirting it should be grooved, as also the chest-lid and slip feathers inserted. It should also be nailed with fine wrought brads. After it is firmly fixed and dry, it is rounded on the outer edge. The extent of the rounding is found by shutting down the lid and drawing all round at the edge of the band, over which the skirting projects about $\frac{5}{16}$ in. The inside of the lid may be panelled. This panelling is simply a flat veneered surface, the 2 panels being root walnut, and the borders rosewood; the veneering must be done before the

skirting is put on. The 2 panels are laid first; when dry, the cutting gauge is set to $2\frac{1}{4}$ in., and cuts away the over veneer all round, which, of course, gives a border of $2\frac{1}{4}$ in. to be veneered with the rosewood; $2\frac{1}{4}$ in. also divides the 2 panels in the centre, and the 8 corners are marked off with compasses set to $1\frac{1}{2}$ in., and cut clean out with a gouge. All the edges are planed with the iron plane, and the rosewood border is planed and jugged all round in the form of "banding"—that is, with the grain running across and not the lengthway of the borders. The round corners are fitted in in 2 pieces mitred in the centre. A till has now to be made. The body or carcass of this is entirely of $\frac{1}{2}$ -in. wood. It has 2 drawers in the length at the bottom, 3 in. deep on the face; 3 in the centre in the length, $2\frac{1}{2}$ in. deep on the face; and over these is a tray, covered by a lid. The face of this tray is in the form of 4 drawers, which are shams. The drawers are 9 in. broad from front to back, and run on shelves $\frac{1}{2}$ in. thick, with divisions between of the same thickness. The shelves and divisions, as also the edge of the lifting lid, are slipped with rosewood on the fore edges, and the drawers being veneered with root walnut, the whole has a good effect. The lifting lid is panelled with veneer, similar to the lid of the chest, the rosewood border being $1\frac{1}{2}$ in. broad. It is hinged with 3 brass butts, $1\frac{1}{2}$ in. long, to the back of the till, which projects upwards the thickness of the lid, and is veneered also with rosewood. This lid may be made of bay mahogany or good pine; and if of the latter, it must be veneered on the under side with plain walnut or mahogany, to counteract that on the top and prevent warping. The carcass (case) of this till is constructed as follows:—The 2 ends are cross-headed on the upper edge; these are $1\frac{1}{4}$ in. broad, and may be put on with the ploughs. Then the bottom and 2 shelves are squared up to the length of inside of the chest, having been previously slipped on the fore edges with rosewood $\frac{1}{2}$ in. thick. The bottom is dovetailed into the 2 ends, while the 2 shelves are mortised or let into the ends with square tenons, which pass quite through, and are wedged. The divisions between the drawers are let through, and wedged in the same manner. The front of the tray, which has the appearance of 4 drawers, is of $\frac{1}{2}$ -in. mahogany, veneered with root walnut, like the drawer fronts, and an imitation of the fore edges made on it by glueing slips of rosewood, $\frac{1}{2}$ in. broad, to represent the fore edges. The walnut front must, of course, be sandpapered before these are put on. The 5 drawers *k* are made entirely of straight, plain, bay mahogany, $\frac{1}{2}$ in. thick, excepting the fronts, which are $\frac{1}{2}$ in. The knobs *l* are of rosewood, $\frac{3}{4}$ in. diameter. The tray, covered by the hinged lid, is so deep as to hold the brace or tools of the like bulk. The left end may be occupied with 3 shallow trays, one over the other, for holding the several bits belonging to the brace, and are very handy, as the bits can be arranged in order, and the trays may be lifted out to the bench, when a number of the bits is wanted. The remainder of the tray is lined with green frieze and holds the brace, spirit-level, gauges, squares, and other of the finer tools. The 2 long drawers at the bottom are used for chisels, gouges, spoke-shaves, mitre-squares, &c., while the 3 upper ones are for gimlets, bradawls, compasses, pliers, and sundry small tools. In the space *b*, in the body of the chest and under the till, the planes are arranged as shown. In front of them is a space 4 in. broad and the full length of the chest. In it long tools, such as the trammels, are kept, and any planes that the back space will not admit, such as raglets or grooving planes, which have 2 wedges. It is also useful for holding drawings of large dimensions, rolled up, where they are safe from damage, and in cases of removal it is the receptacle for the hand-saws and other tools which usually hang upon the wall.

Bench.—A full-sized cabinet-makers' bench is generally 7 ft. long and $2\frac{1}{2}$ ft. wide, but a very convenient size is 6 ft. by 2 ft. Such a bench is illustrated in Fig. 683. The top is in 2 parts, the front portion *a* being 15 in. wide and of $2\frac{1}{2}$ -in. red or yellow pine, sound and straight; the back portion *b* is only 9 in. wide and $1\frac{1}{2}$ in. thick. Both are supported by the cross rails *c*; and the back part has a fillet *d*, 1 in. thick, screwed to it in such a position that its top edge is flush with *a*. The rails *c*, 5 in. by 2 in., are screwed to the top ends of the 4 legs of good red pine, the 2 back ones *e* and right front one *f*

measuring 4 in. by 2 in., while the left front one *g* is 6 in. by 2 in. The back legs *a* diverge at foot to give greater steadiness to the bench. The top is secured to the rails *c* by screws put up from beneath. At bottom, the legs are joined by rails *h*, 3 in. by 2 in., dovetailed into them and held by screws; boards *i* are nailed to their under side, to form a capacious tray for holding tools. The bench stops *k* are let into holes which come

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clear outside the rail *c*. The bench vice *l* has its outer cheek working against the leg *g* by means of the screw *m* passing through both. At the bottom is a "runner" or "sword" *n*, consisting of a strip of wood, 2 in. by $\frac{1}{2}$ in., mortised into the foot of *l* and sliding in a corresponding groove in *g*, where it is pegged by an iron pin at suitable distances for keeping the jaws of the vice parallel. This is further aided by the supplementary side screw *o*. The holes in the leg *f* and central bar *p* hold strong pegs for supporting the ends of work while it is being manipulated in the vice. The space between the top *a* and the rail *r* may be made into a shelf only, or partially occupied by a drawer as at *s*.

Planes.—Besides the ordinary planes, the cabinet-maker uses a "toothing" plane. This has a stock similar to the hard wood hand-plane, but the iron, instead of having a cutting edge, presents a series of sharp teeth to the wood. This serrated edge is formed by long narrow grooves on the face of the iron next the wedge, and when the iron is ground in the usual manner these ridges terminate in sharp points. In setting-up this iron on the oil-stone, only the ground back is applied to the stone. The position of the iron in the stock is nearly perpendicular, so that it is simply a scratch plane, and needs no cover like the others. Its use is to roughen the surfaces of pieces to be glued together, for while it takes off the ridges left by the half-long or panel plane, it roughens the surface by scratching, thereby adapting it better to hold the glue. All surfaces to be veneered upon, as well as the veneer itself, are scratched with this plane.

Dowel plate.—The dowel plate is a steel plate about $\frac{1}{2}$ in. thick, with holes from $\frac{3}{16}$ in. to $\frac{1}{2}$ in., and centre-bits are fitted and marked so that dowel pins made in the holes will fit holes made by the corresponding bits.

Smoothing implements.—The "scraper" is a bit of steel plate about the thickness of a hand-saw blade, 5 in. by 3 in.; its use is to take off any ridges left by the smoothing plane in planing hard wood, producing a surface perfectly free from lumpiness; it is