Section X

Part I.—AIRTIGHT-CASE MAKING

By EDWARD B. BAKER

My aim in preparing this small treatise has been to supply the necessary information for enabling a practical joiner or cabinet-maker to become a competent airtight-case maker,

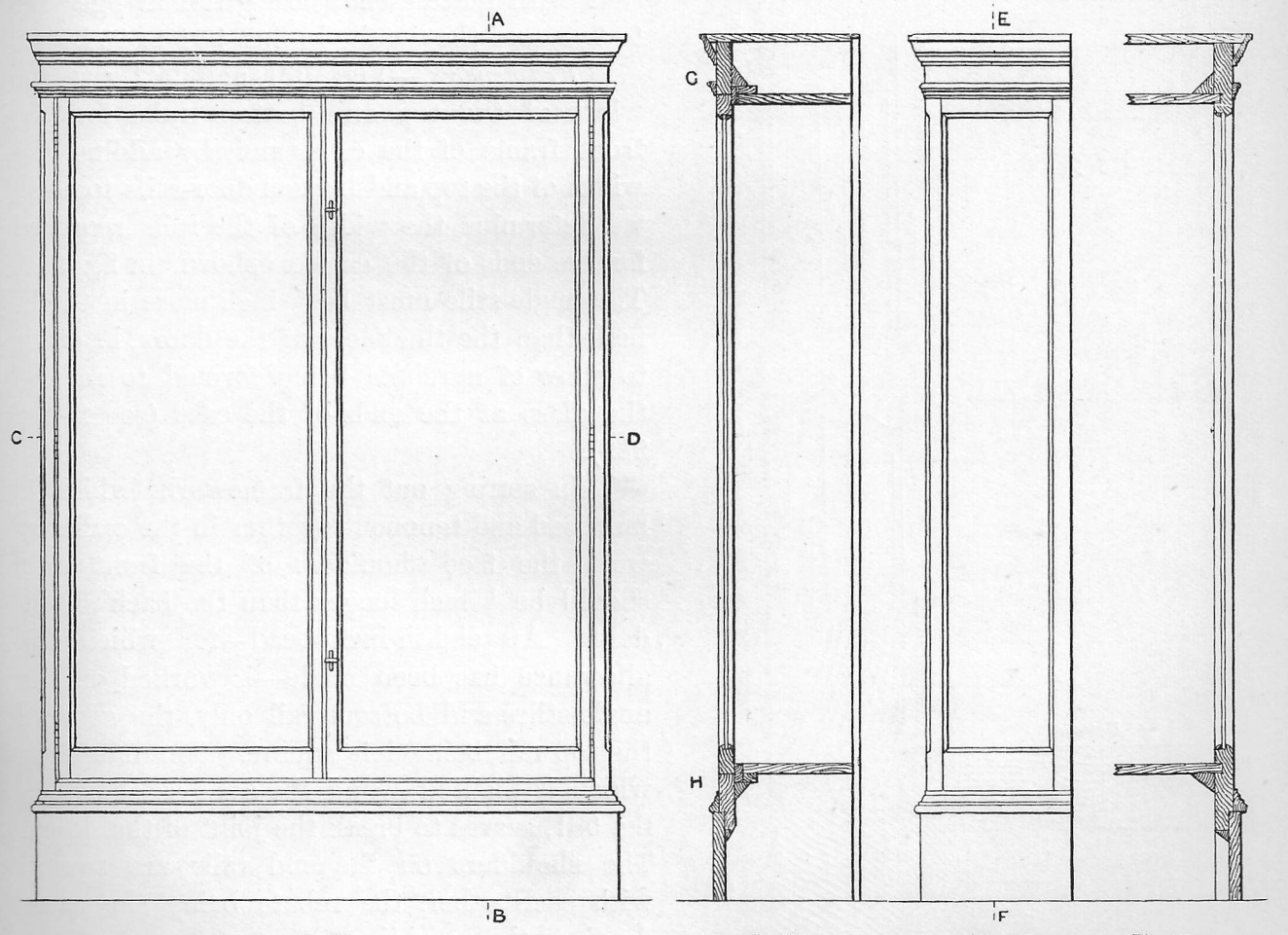


Fig. 976 Fig. 977 Fig. 979 Fig. 980

Fig. 978

Figs. 976 to 980.—Airtight Wall-Case with Glazed Ends

Fig. 976, Front elevation; fig. 977, vertical section on line A B; fig. 978, horizontal section on line C D; fig. 979, side elevation; fig. 980, vertical section on line E F

without the tedium of waiting, perhaps for years, until chance brings him into contact with one who has made a speciality of this class of work. I have endeavoured, by means of

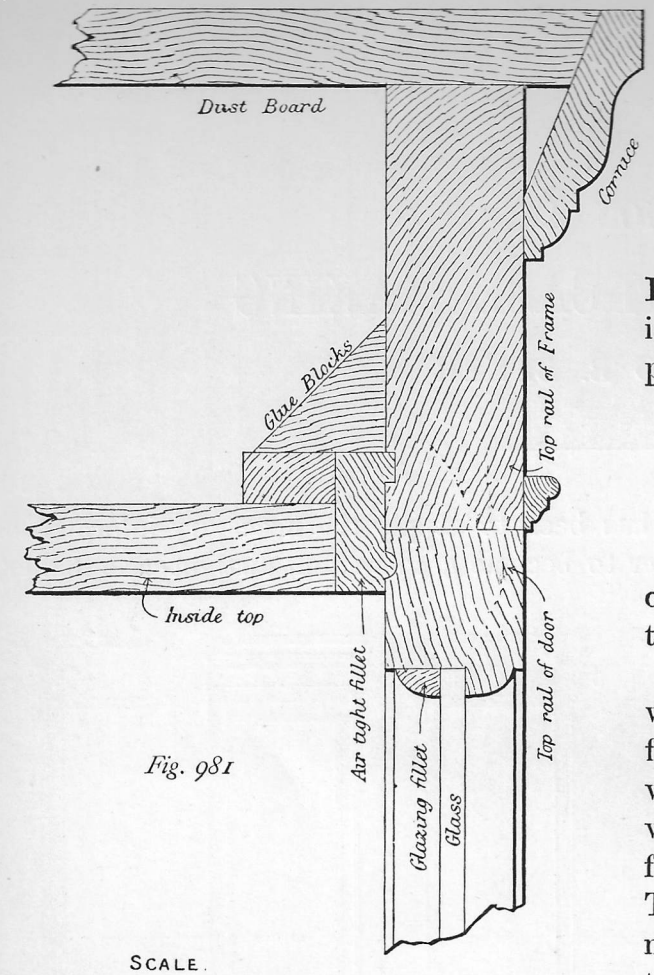


Fig. 981

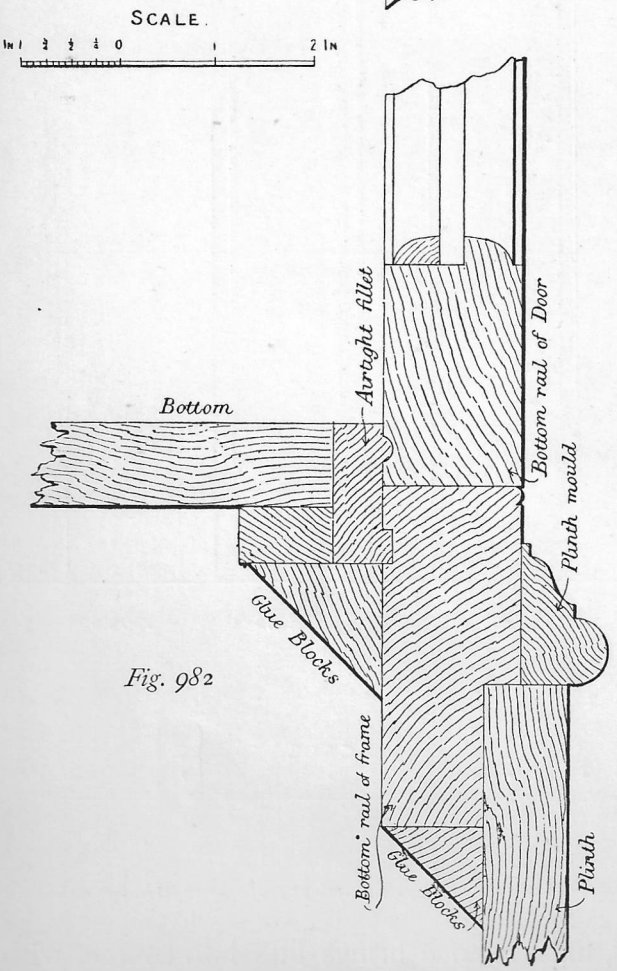


Fig. 982

Figs. 981 and 982.—Details of Airtight Wall-Case (fig. 977)
Fig. 981, Detail at G; fig. 982, detail at H.

illustrations, to elucidate as clearly as possible the points which are so frequently the cause of failure to those who, while having a good knowledge of wood-working, have not had the advantages of direct practical tuition in the intricacies of airtight-case making.

Before proceeding with the explanations, I would point out that the first and most important rule in joinery is to have the stuff planed up true, and gauged accurately to size.

1. AIRTIGHT WALL-CASE WITH GLASS OR WOOD ENDS

The general drawings of an airtight wall-case with glazed ends are given in figs. 976 to 980, and the details in figs. 981 to 984.

Framework.—Figs. 981 and 982 give the width of the top and bottom rails for the front frame of the case, and, by adding the width of the top and bottom door-rails to each, we determine the width of the rails required for the ends of the case, as shown in fig. 980. The angle-stile must be $\frac{1}{4}$ inch more in thickness than the thickness of the doors, in order to allow of a rebate being formed to receive the glass at the ends of the case (see M, fig. 983).

In setting out the framework (which is mortised and tenoned together in the ordinary way) the face shoulders of the front rails should be $\frac{1}{8}$ inch longer than the back shoulders. An eighth-inch bead—for which the allowance has been made—is worked on the angle-stiles and bottom rail only, the edge of the top rail being left square. The moulding which is planted round the case, as shown in fig. 981, serves to break the joint of the doors. The shoulders on the end rails are square with each other, the rebate being the same depth as the moulding.

Airtight Joints.—To make successfully the airtight joint between the angle-stile of the case and the hanging stile of the door (see fig. 983), three planes are required. The first plane is used on the angle-stile for forming at the same time the two grooves, each $\frac{3}{16}$ inch wide; the second is used for working the two fillets together; and the third for working the two hollows in the door-stiles.

The front part of the frame must now be

fitted together and the joints at the back of the frame cleaned off, to allow the airtight planes to be worked from the back of the frame, that is, from the inside of the case, as the doors would not close accurately if they were worked from the face or outside.

After the front frame has been fitted together as described, it must be taken apart, and the angle-stiles worked with plane No. 1. When this has been done, the fillets must be glued in the grooves, and, when set, rounded over with plane No. 2. The fillets will not require to be taken to the exact width before rounding over, as plane No. 2 works all surplus stuff away.

For the joint between the top and bottom rails of doors and the airtight fillets respectively, two planes are required: the first for sticking the airtight fillet, and the second for working the small hollow on the door-rails to match the fillet.

Continuing with the framework. After rounding the fillets in the angle-stiles, groove the top and bottom rails to receive the tongue on the airtight fillets as shown in figs. 981 and 982, and rebate the bottom rails to rest on the plinth (fig. 982). The top and bottom rails at each end of the case are trenched to receive respectively the ends of the inside top and the inside bottom (see fig. 980). Care must be taken to make these trenches in such a way as to keep the inside top and the inside bottom in the positions shown in figs. 981 and 982. Rebate the back angle-stile of each end frame to receive the back (as in fig. 983), and run a small hollow in the angle of the rebate. Glue and pin the airtight fillet on the front edges of the inside top and bottom respectively; also glue the fillet on the back of each in order to strengthen the airtight fillet, and make out the thickness to receive the glue-blocks as shown. An ovolo or other moulding is now worked on the external angles of the two front angle-stiles, as shown in fig. 983, the moulding being stopped on a line with the top and bottom rails respectively of the doors (see fig. 976).

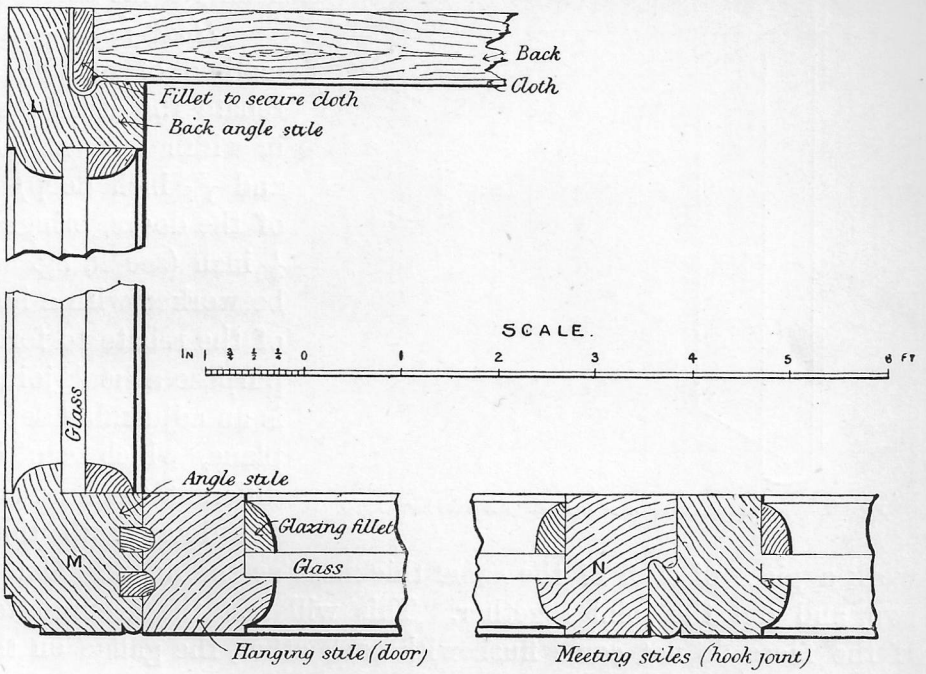


Fig. 983.—Details of Airtight Wall-Case (fig. 978)

The body of the case must now be put together, care being taken to glue-block the front frame and ends securely to the bottom and top, as well as behind the plinth, which is screwed to the bottom rails from the back.

Match-boards are used for the back, the boards being run to the floor, as shown in fig. 977. Mitre the cornice round the front and ends, screwing it from the back of the top rails; cut the dust-board to fit on the top edges of the rails and bevel against the cornice, having previously rebated it to receive the back of the case. Before the back is fastened, the cloth (fig. 983) should be placed in the rebate of the stile, the fillet placed on top of the cloth and pressed into the hollow, and then fastened to the stile with screws, the cloth thus being securely held between the fillet and the stile. The cloth can now be stretched taut and fixed at the other end in the same way, and the boards fastened in.

Doors.—In planing up the stuff for the doors, the same gauge must be used as that

for the frame of the case. When setting out for the doors, take the width and height accurately, and allow $\frac{1}{16}$ inch on the height for fitting in. The width is set out as for ordinary folding doors, viz. allowing half the hook-joint on each door, and $\frac{1}{8}$ inch for jointing and fitting in. The best way to allow for fitting is to have each stile $\frac{1}{16}$ inch greater in width than the finished size required.

The rails abutting against each angle-stile are single-mortised and tenoned together as in ordinary work, but double mortises and tenons must be used at the top and bottom of each meeting stile, as shown in fig. 984. The reason for using the double tenon is, that if a single tenon were used, the ends of the tenon would chip off after the hook-joint had been made.

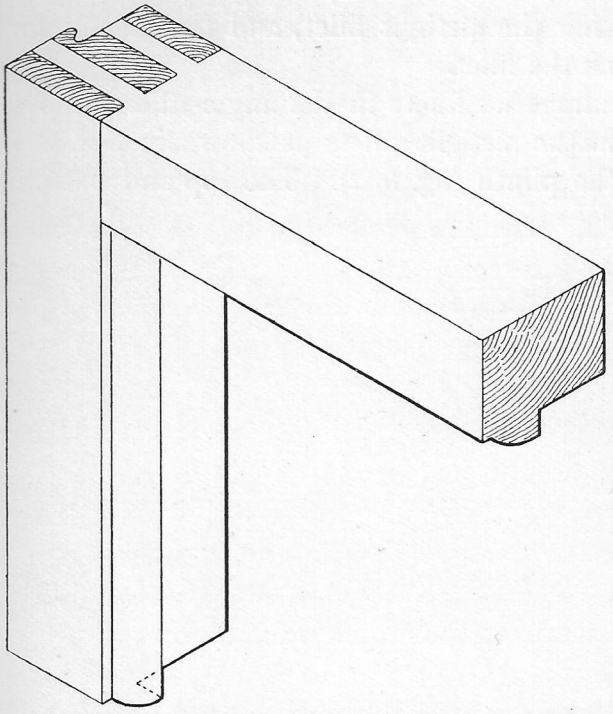


Fig. 984.—View of Double Tenon of Top Rail (below the haunching)

Presuming the doors to be wedged up, level off the joints at the shoulders, when the doors will be ready for jointing together and fitting to the case.

Hook-joint. — The following is the best method of making a well-fitting joint. First rebate the stiles (the rebate being $\frac{1}{8}$ inch less in width than half the thickness of the doors, and $\frac{5}{16}$ inch deep), and next bevel the edges of the doors, bringing the rebate to a depth of $\frac{1}{4}$ inch (see N, fig. 983). The doors must now be worked with a hollow and round on the edge of the rebate to form the hook-joint. For this purpose a hook-joint plane is required. There is an adjustable depth-gauge on the side of the plane, which can be easily set for working different thicknesses of stuff. Before working the doors with the plane, it is advisable to work a piece of stuff of the same thickness as the doors. Cut the piece thus worked into two, and put the joint together. This will test the accuracy of the setting of the plane. If the faces do not come flush with each other, the gauge on the plane must be raised or lowered accordingly.

Having fitted the meeting stiles, place the doors together across the bench, as they can thus be more easily taken to the exact width and height of the frame of the case. After the doors have been fitted in the opening, work with the airtight planes as previously instructed, always remembering to hold the fence of plane No. 3 on the back side of the door while forming the hollows on the hanging stiles. With plane No. 2 the small hollow on the top and bottom rails to match the airtight fillet is worked.

After working the doors as described, clean off the back side, place the doors in position, and clean off the face to the level of the frame. Take the doors out and work the bead on the joint between the doors (fig. 983). This bead is flatter than usual, and has a very small quirk.

The doors are hung to the frame, each by three hinges. The top and bottom hinges are usually kept their own depth from the top and bottom edges of the doors respectively, *e.g.* a $2\frac{1}{2}$-inch hinge will be $2\frac{1}{2}$ inches from the edge. The handles on the meeting stiles are respectively about 9 inches from the upper and lower edges of door.

All glass in the doors must be carefully packed with small slips of wood between the edges of the glass and the frame of the door, in order to keep the frame rigid. The woodwork being so slight, the doors would sag when hung if the glass were not packed tightly, as all the weight of the glass would fall on the bottom rail.

Shelves.—The following is the best method to adopt for fitting the case with shelves, as, when fitted in this way, the shelves can be moved to any required height. To the back of the case screw two pieces of iron, one at each side, extending from the top to the bottom of the case. These must previously have been drilled and tapped their whole length, the space between each hole being $\frac{1}{2}$ inch from centre to centre, and each hole being large enough to receive a $\frac{3}{16}$-inch screw. A malleable-iron bracket about 3 inches long on the back edge—the length of the top edge being the width of the shelf—is now required, having a small piece projecting above the top edge in which is drilled a plain hole, and having a pin near the bottom edge. The pin at the bottom edge is placed in one of the holes in the tapped bar, and a $\frac{3}{16}$-inch screw is passed through the hole at the top edge and screwed into the bar, thus securing the bracket firmly. Care must be taken to have the distance between the centre of the pin on the bracket and the centre of the plain hole equal to the distance between the centres of any two holes in the bar.

Fig. 985 shows a horizontal section through a showcase having solid ends.

Fig. 986 shows a horizontal section through the centre hanging stile in the front frame of a wide showcase, when two pairs of doors are required. It is worked in the same manner as previously described for hanging stiles.

Fig. 987 shows a section of a cross-bar in doors. This is only required where sheet-glass is used.

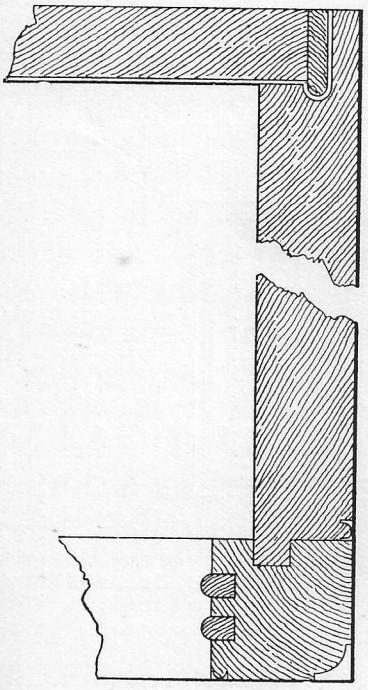


Fig. 985

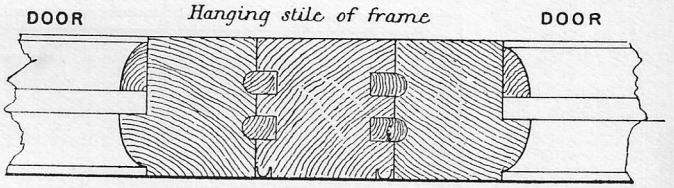


Fig. 986

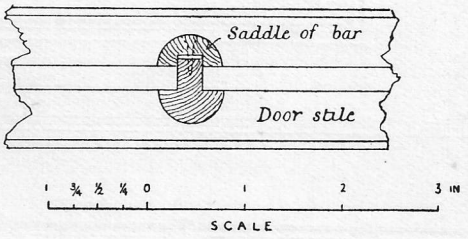


Fig. 987

Figs. 985 to 987

Fig. 985, Detail of solid end to wall-case; fig. 986, detail of central hanging stile for folding doors; fig. 987, detail of cross-bar in doors

Each end of the bar is sunk into the moulding of the door-stiles. The saddle is cut between the rebates, and secured to the bar.

Plinths separate from the Case.—If the showcase is over 6 feet 6 inches in height, or the plinth is of a greater depth than 12 inches, it is advisable to make the plinth separate from the case. Instead of the bottom rail being rebated behind the plinth, as shown in fig. 982, a frame must be made out of $1\frac{1}{2}$-inch by 3-inch stuff dovetailed together at the angles; and two or three bearers should be mortised and tenoned between the front and back rails (as the length of the case may require). At each angle, and under each end of the bearers, a leg is stump-tenoned into the under side of the rails to support the case. When this is done, the plinth should be mitred round the frame. It should be screwed from the back, and glue-blocks used in all the angles.

2. AIRTIGHT COUNTER-CASE

An isometrical projection of a counter-case is shown in fig. 988. The top, sides, and front are of plate-glass. Mirrors are placed on the inside of the doors at the back of the case. The divisions on the bottom show the position of the trays.

Before commencing work, it is absolutely necessary to draw figs. 989 to 991 full size, to enable the taking off, and working to an exact size, of the various parts required, to be done.

Bottom of Case.—Commence with the frame, which should be made out of well-seasoned pine. The width of the bottom frame will be the extreme width of the case less the thick-

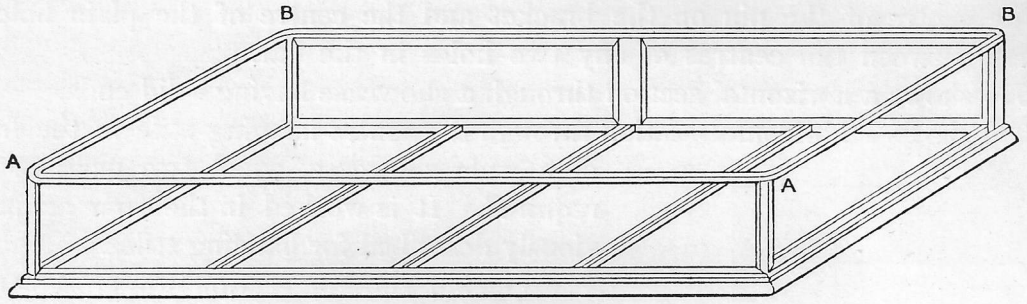


Fig. 988

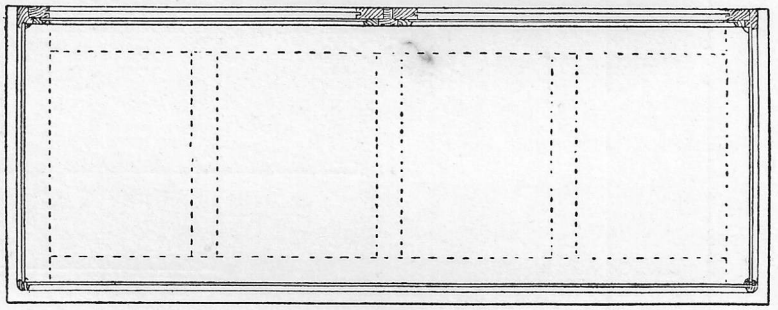
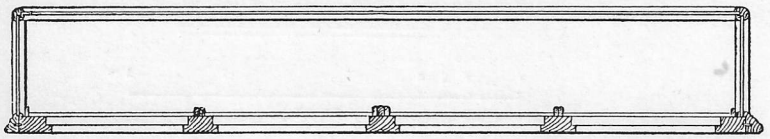


Fig. 989



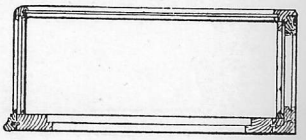


Fig. 991

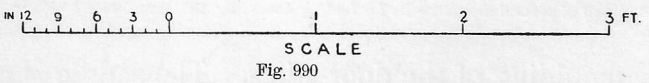


Fig. 990

Figs. 988 to 991.—General Drawings of Airtight Counter-Case

Fig. 988, Isometrical projection; fig. 989, plan; fig. 990, longitudinal section; fig. 991, transverse section

ness of the moulding on the front edge and $1\frac{1}{2}$ inch for a hardwood slip on the back edge of the frame (see fig. 992). The length will be the extreme length of the case *minus* two thicknesses of moulding.

Mortise and tenon the frame together, and rebate it to receive $\frac{5}{8}$-inch panels flush on the inside; then glue up and take to size. The hardwood slip can now be jointed and glued on, a tongued and grooved joint being used for this purpose. After this has been done, the airtight rebate to receive the doors should be worked on the hardwood slip. In order to make a good job of the rebate, it will be necessary to have a special plane for working both the rebate and the small half-round tongue at one time.

To complete the bottom, groove the front edge and both ends for the tongue, then mitre and fix the moulding to the frame. The moulding must be specially noted. It must project

above the bottom $\frac{3}{16}$ inch to form a rebate for the glass; and the first member, *i.e.* the part projecting, must be rounded to intersect with the upright angle-bars (figs. 992–993), which mitre into the moulding.

The panels in the bottom are to be screwed to the frame. Before putting the whole case together, they must be taken out for enabling the small fillets which secure the glass to be easily screwed into their respective positions.

Framework for Glass.—Plane up the stuff for the round angle-bars, gauging it to $\frac{9}{16}$ inch square, and rebate $\frac{1}{8}$ inch deep and $\frac{1}{8}$ inch from the face-edges. The angle-bars will then appear as seen in fig. 995. For the back part of the frame, square up the stuff to $1\frac{1}{2}$ inch by $\frac{3}{4}$ inch, and rebate $\frac{1}{4}$ inch deep and $\frac{1}{8}$ inch from the face for the glass. For the doors, take out the rebate $\frac{1}{4}$ inch deep by $\frac{5}{8}$ inch wide; bevel the rebate to $\frac{5}{16}$ inch deep on

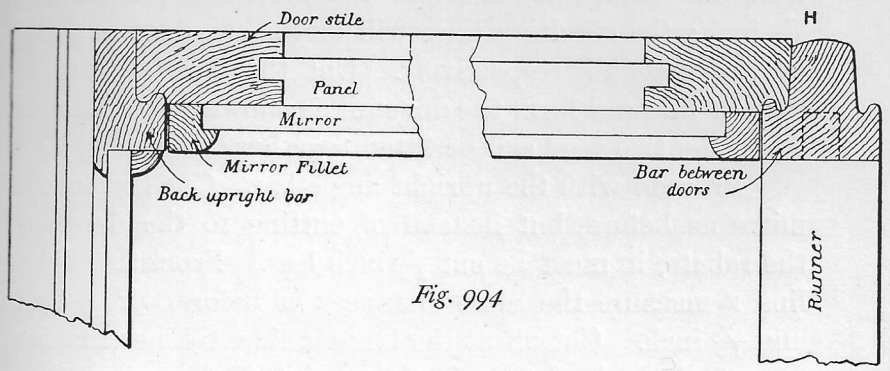
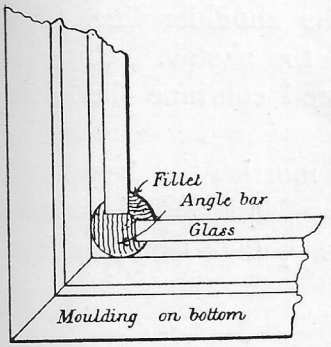


Fig. 994



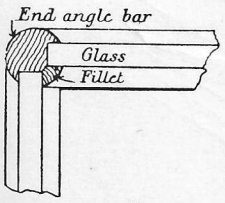


Fig. 993

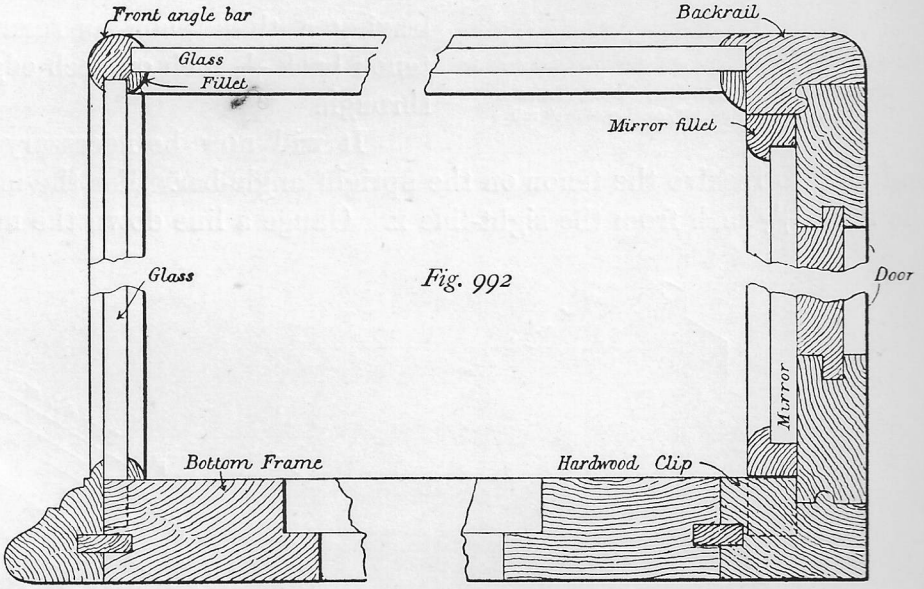
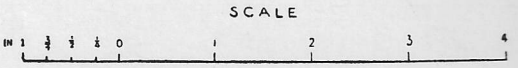
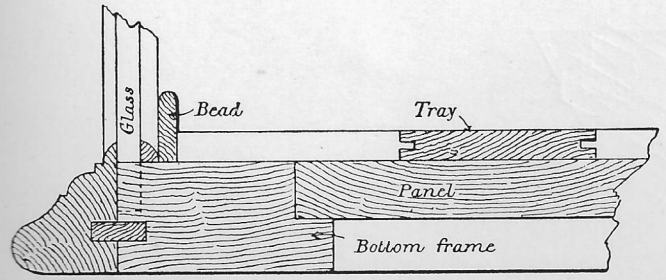


Fig. 992





Figs. 992 to 994.—Details of Airtight Counter-Case

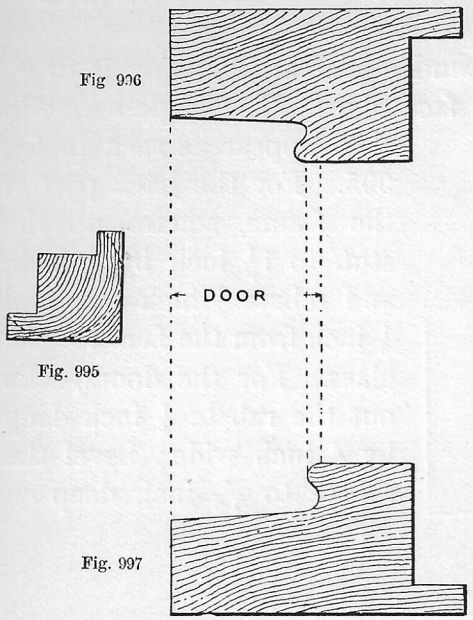
Fig. 992, Details of transverse section (fig. 991); fig. 993, details of longitudinal section (fig. 990); fig. 994, details of plan (fig. 989)

the outside edge (as shown in fig. 996), and work the hook-joint plane on the edge of the rebate. It is best to make the mitred joints first, as they require careful fitting together, and the bottom ends can afterwards be easily taken to the required length and cut.

Fig. 998 contains isometrical projections showing the joints at the intersection of the front and the end angle-bars with the upright angle-bar. The position of the joint is shown at A, fig. 988.

Three pieces of the required section (fig. 995) should be got out, and the joint worked as follows:—

Commence with the front and end angle-bars, cutting a square mitre (45°) on each outside face of both bars, bringing the external angle to a point, as shown in the sketch. Cut the mitre down to the rebate line and cut the surplus away, leaving the core of the bar projecting, which will be the part C. The internal part of the mitre E is the sight-line. Square down and across the core; then, from the sight-line, measure distances of $\frac{1}{8}$ inch and $\frac{7}{16}$ inch; the resulting lines will be the shoulder and end of the dovetail respectively. Cut the core off at the longest line and form the dovetail as shown in the sketch, when the two bars can be fitted together.



Figs. 995 to 997.—Full-size Details of Airtight Counter-Case
Fig. 995, Section of angle-bars; fig. 996, section of back upright bar; fig. 997, section of back rail

Proceed with the upright angle-bar. Cut the square mitre as before, but instead of cutting to the depth of the rebate, it must be cut $\frac{1}{32}$ inch less. From the sight-line F measure the same distances as before, viz. $\frac{1}{8}$ inch and $\frac{7}{16}$ inch. Cut off at the longest line, taking care not to cut through the projecting point of the mitre, then take out the core C back to the shoulder line, thus leaving a thin tenon as seen in the sketch. Cut the tenon back $\frac{1}{16}$ inch on each edge and continue the mitre through.

It will now be necessary to mortise the front and end bars to receive the tenon on the upright angle-bar. For the mortise, square a line across the mitre $\frac{1}{16}$ inch from the sight-line E. Gauge a line down the mitre $\frac{3}{32}$ inch from the face

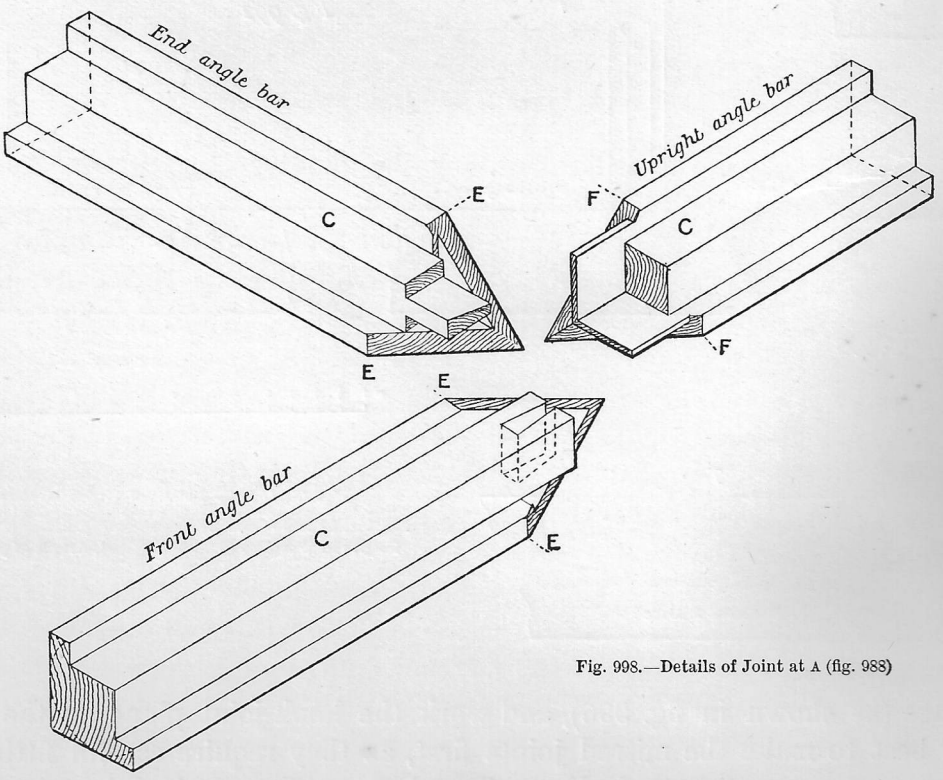


Fig. 998.—Details of Joint at A (fig. 988)

of the bar, leaving $\frac{1}{32}$ inch (the width of the mortise) between the core of the bar and the gauge-line. The depth of the mortise will be to within $\frac{1}{8}$ inch from the other face.

The work must be done very carefully, and great care taken to have the tenon on the

upright angle-bar of the thickness stated, viz. $\frac{1}{32}$ inch, as the result of having it of greater thickness would be that, when the bars were rounded, it would work through to the face.

The front angle-bar will have the same joint on both ends. The joint at the back of the case on the end angle-bar is cut as shown at fig. 999. The joint at the bottom end of each upright angle-bar is simply a square shoulder cut to the depth of the rebate, leaving the core of the bar projecting to form a stump tenon. The bars are afterwards mitred with the moulding on both the front and the end, the projecting round of the moulding being

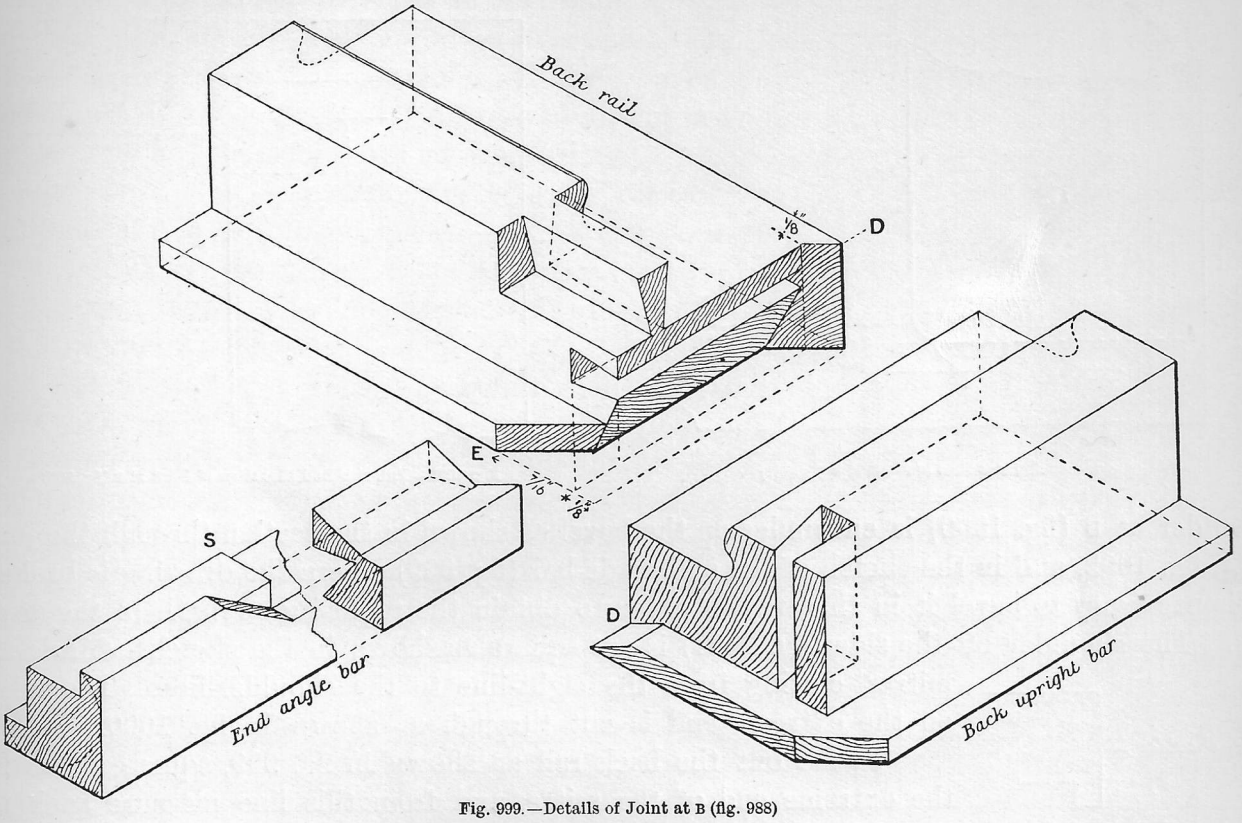


Fig. 999.—Details of Joint at B (fig. 988)

cut away between the mitres in order to allow the shoulder to butt on the first square member, which will be flush with the bottom.

Fig. 999 contains isometrical projections showing the joints used to unite the back rail with the back upright angle-bar for forming the door opening: and also the end angle-bar. The position of the joint will be clearly understood by referring to B, fig. 988.

It will be well to follow the same system as in the last group of joints, *i.e.* to prepare a piece of the required section of back rail (fig. 996) which, when cut into two parts, can be used for both the back rail and the back angle-bar; the only difference in the section of the two being that the back rail is rebated $\frac{1}{16}$ inch less than the thickness of the doors instead of $\frac{1}{8}$ inch less as in the back upright bar (fig. 997). The reason for this is so as to allow the round of the hook-joint on the back upright bar to project over the hook-joint on the back rail which butts against it. It also allows a continuous hollow on the edges of the doors, which would not be the case if the rebates were kept flush with each other.

The end angle-bar is dovetailed into the back rail, and is also mitred both at the extreme end and at the rebate. Fig. 1000 shows the plan of this joint. It will be observed that the joint has been left open to show the bevel from the shoulder line to the dovetail on the back rail, as at A, fig. 1002.

The back rail is also dovetailed to receive the upright bar. If the reader will look at fig. 999, and imagine the upright placed into position on the back rail, he will notice that D, D meet and form the remaining part of the mitre, leaving a shoulder and mitre to join the

end angle-bar when in position. The exact position of the latter is seen in fig. 1001, the dotted lines showing the position of the dovetail on the back rail.

We will now proceed to set out the work.

Commencing with the end angle-bar, square off a line for the extreme end of the mitre at B, fig. 1000, and measure back the width of the back rail (namely $1\frac{1}{2}$ inch) to C, which will be the sight-line. From the sight-line set off $\frac{5}{16}$ inch for the shoulder of the dovetail as at S, figs. 999 and 1000; then set off $1\frac{3}{8}$ inch from the sight-line to the end of the dovetail. Set a gauge to the centre of the angle-bar for the shoulders, as at D, figs. 1000 and 1001. The

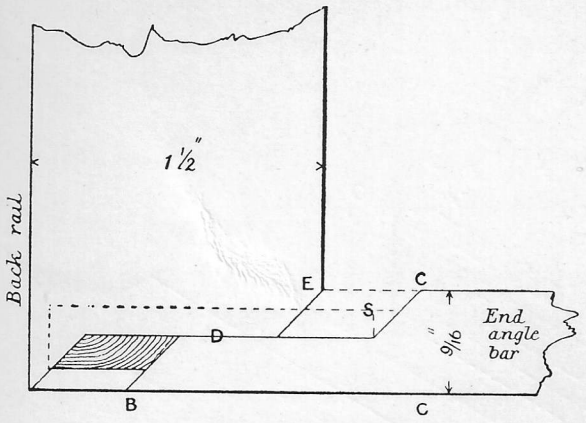


Fig. 1000.—Full-size Plan of Joint at B (fig. 988)

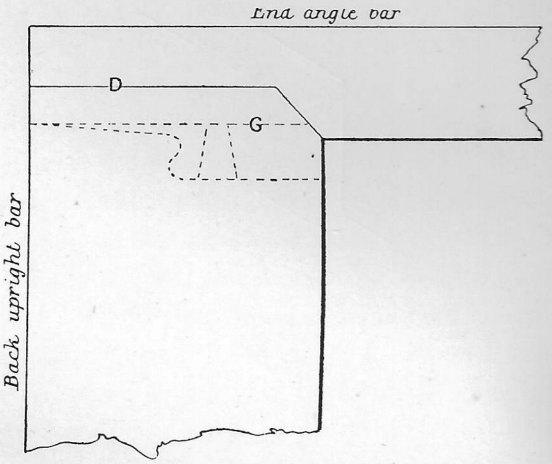


Fig. 1001.—Full-size End Elevation of Joint at B (fig. 988)

shoulder at D (fig. 1000) is cut under on the bevel as shown in the section through the joint at A, fig. 1002, and in the sketch of the end angle-bar (fig. 999) where the drawing is broken. It is necessary to bevel it in this way in order to obtain the requisite strength in the dovetail. The shoulder on the side (fig. 1001) is cut square as shown in the sketch. Mark the mitres, cutting from the sight-line to the shoulder-line. The mitre on the extreme end is cut through as shown in fig. 1000.

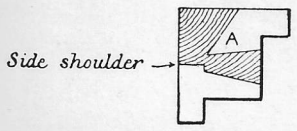


Fig. 1002.—Section through Joint of End Angle-Bar (fig. 999)

To set out the back rail as shown in fig. 999, square a line for the extreme end of the mitre, and from this line measure back for the sight-line, namely, $\frac{9}{16}$ inch, the width of the angle-bar, as at E, fig. 1000. Square a line between the two lines obtained, at an equal distance from each, for the shoulder D. From E measure $\frac{7}{16}$ inch towards the end of the bar, and cut off square to within $\frac{1}{8}$ inch of the outside edge; this is clearly shown in fig. 999.

To mark the dovetail of the end angle-bar, make a thin hardwood or zinc pattern to fit the dovetail on the angle-bar, and apply it to the rebate of the back rail, cutting the dovetail out very carefully to within $\frac{1}{8}$ inch of the outside edge. On the top side of the rail mark the external mitre from the extreme point to the shoulder-line, and cut as shown in figs. 999 and 1000. Before the mitre can be completed, the bevel must be cut along the shoulder-line and edge of dovetail, and must work out against the mitre. The internal mitre is cut from the sight-line.

There now only remains the cutting of the dovetail to receive the upright bar. Referring to fig. 999, it will be seen that it is necessary to obtain the shoulder-line only, which is accomplished by measuring from the extreme point of the mitre (D, fig. 999) $\frac{3}{4}$ inch, the thickness of the upright bar. The position of the dovetail-joint between the back rail and the back upright bar is shown by the dotted lines in fig. 1001.

The exact lines for setting out the back upright bar (see fig. 1001) are found as follows:—Square the shoulder-line D and set off for the back shoulder $\frac{1}{4}$ inch as shown by the dotted line G. The back shoulder is then cut off to within $\frac{1}{8}$ inch of the face, as in the sketch, fig. 999. Make a pattern to fit the dovetail on the back rail, and apply it to the

back of the bar. Mitre the $\frac{1}{4}$-inch projection on the outside edge, and also mitre the inside as shown.

It is absolutely necessary that the whole of this work should be executed very carefully and very neatly. When the above-mentioned joints have been fitted, take the bars to the required length.

To set out the bottom end of the back upright bar, cut the face-shoulder square and mitre with the moulding as previously described for the front angle-bar. Allow the back-shoulder to be $\frac{1}{4}$ inch longer, so as to fit in the rebate for the doors, the tenon being in the position shown by the dotted lines in fig. 992.

After all the joints have been made, round the angle-bars and the back rail. The external angles of all upright angle-bars must have the rounding turned out about $\frac{1}{2}$ inch above the bottom shoulder, leaving the bottom part of the bar square to follow the line of the moulding. The joints can now be glued together and cleaned off.

The double-rebated upright bar between the doors (as at H, fig. 994) is cut to fit both the top and bottom rebate, a small dovetail being cut at both ends in the positions shown by the dotted lines. The front edge of the bar is slightly rounded to break the joint between the doors. From the inside of the bar a runner of the same thickness as the bar is screwed to the bottom of the case, to keep the trays in position.

Doors.—There is nothing special to note in framing up the doors; they may be either tenoned or dowelled together. The panel is prepared flush on the inside.

Carefully fit the doors to the opening, and work the hook-joint on the top edge and both ends. It will be remembered that the hook-joint must be worked through on each end; and also that it is deeper than the hook-joint on the top rail. In working the small hollow to fit over the fillet on the bottom edge, work the plane from the back side of the door.

Hinge the doors on the bottom edge, fixing the butts against the outside edge of the half-round fillet. When fixed thus the airtight joint will remain intact. The doors are fastened by a spring catch or lock let into the top rail.

When the doors are hung, the position of the mirror fillet can be marked by lining down the back of the doors round the frame. The fillets should be fixed $\frac{1}{32}$ inch inside the lines to allow for clearing.

Trays.—A cross section of the tray is shown in fig. 993. The bottom is prepared from three pieces of $\frac{1}{4}$-inch pine. The grain of the centre piece runs from back to front of the case, the grain of the side pieces being at right angles to it; and the three pieces are tongued and grooved together as shown. Glue the pieces together, and, when set, mitre the bead round the bottom.

Another method of ensuring the bottom against warping is to have the bottom in three thicknesses, the grain of the centre piece crossing the grain of the two outside pieces, and the pieces being glued together.

The inside of the tray and over the bead are covered with velvet or some other material which must be glued to the tray. Glue should be used sparingly so as to prevent it penetrating the material.

3. CIRCULAR-FRONTED COUNTER-CASE WITH GLASS ENDS

Fig. 1003 shows a cross section through a circular-fronted case with glass ends. The only difference in the construction of this case from that of the square case is the bent angle-bar, and, of course, the omission of a front angle-bar.

In making this case it is first necessary to have the glass bent to the shape required. For this purpose a pattern of the curve should be sent to a glass manufacturer. When the glass has been received, make a mould of the same shape, on which to bend the angle-bar,

as shown in fig. 1004. The convex side of the glass will give the rebate line from which to work the mould.

Use birch for the angle-bar as it bends easily; it can be stained to match the other part of the case. Have the bar long enough to bend from the bottom of the case to the back rail.

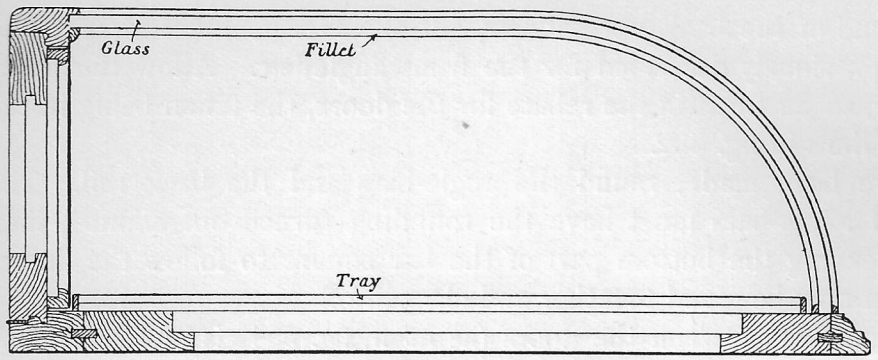


Fig. 1003.—Transverse Section of Circular-fronted Counter-Case with Glass Ends

To bend the bar successfully, cut the top side of the bar away down to the rebate line on the end required to be bent. The length of the part cut away will be from the bottom of the case to a little beyond the springing line. Care must be taken to cut the two bars for the case in pairs. Steam the bars for several hours and then bend them round the mould (fig. 1004) by securing the extreme end first with a cleat, as shown at A. Draw the bar gradually to the mould, secure it in position by the cleat B, and leave it to cool for several hours. It

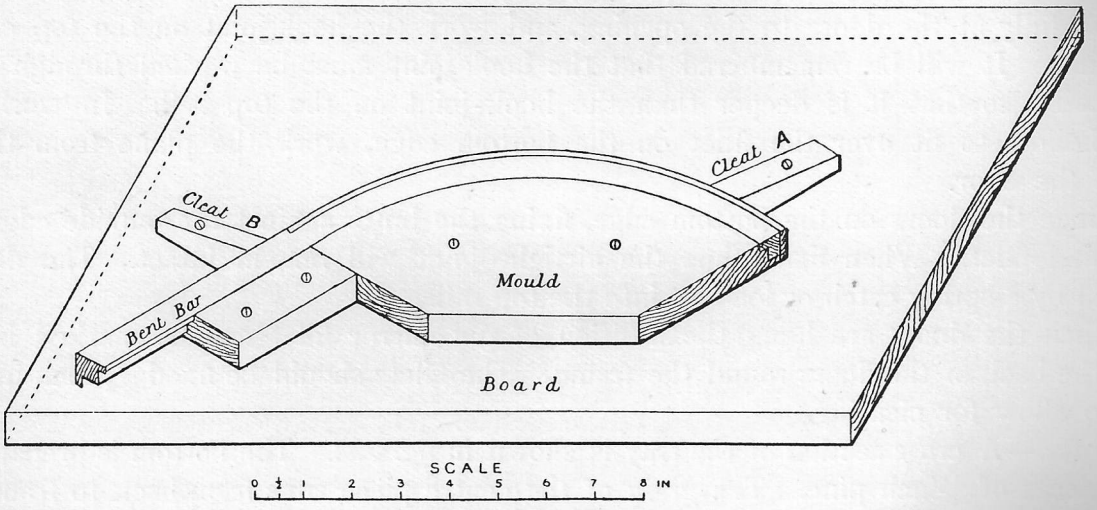


Fig. 1004.—Method of Bending the Angle-Bars

is better to leave it on the mould until the following day, when the strip to form the rebate —which replaces the part cut away—can be fitted and glued in position.

After the bar has been bent, and the strip cleaned off, place it on the drawing-board, and set out the position of the joints at the bottom of the case and on the back rail, as already described.

4. CIRCULAR-FRONTED CASE WITH SOLID ENDS

It will only be necessary, after the preceding explanations, to notice the joint of the back rail, and the section of the solid end. Fig. 1005 shows a section through the solid end of the case, grooved to receive the glass. Fig. 1006 is a plan of the angle formed by the end of the case and the back rail. The clamp A is tongued and grooved to the end, the tongue being stopped $\frac{1}{2}$ inch below the top edge. The clamp is prepared with a hook-joint as shown by the dotted lines. The width of the clamp is the width of the back rail less the rebate for glass.

Fig. 1007 shows in isometrical projection the joint at the junction of the back rail with

the solid end. Imagine that A A are brought together. It will then be seen that they slide into position and present the appearance shown on the plan in fig. 1006, and give the exact lines for setting out the work.

The solid ends are $\frac{5}{8}$ inch thick, finished size. They must be left wide enough to screw

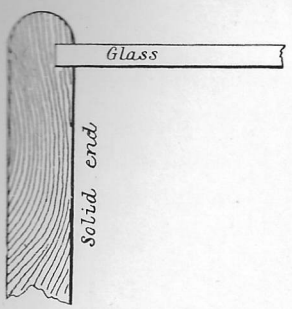


Fig. 1005.—Section of Solid End grooved for Glass

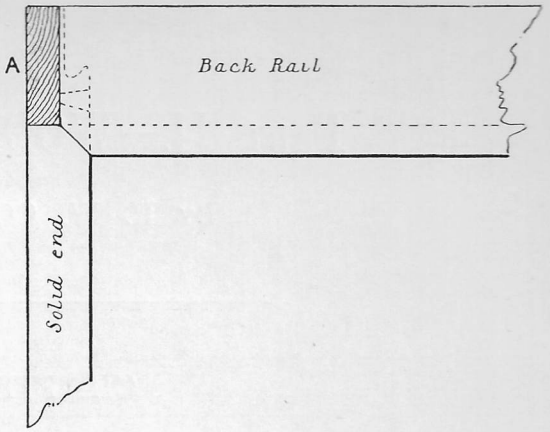
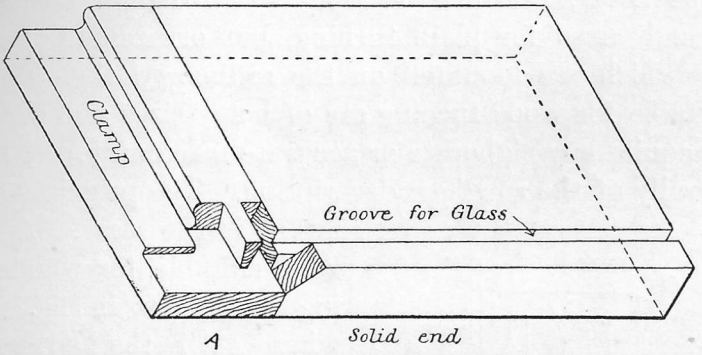


Fig. 1006.—Plan of Joint between Solid End and Back Rail

to the bottom frame of the case. Fix the moulding round the bottom, and mitre it at each inside round of the ends, as before described for upright angle-bars, turning the round on the outside of each end out $\frac{1}{2}$ inch above the moulding. The moulding mitred round



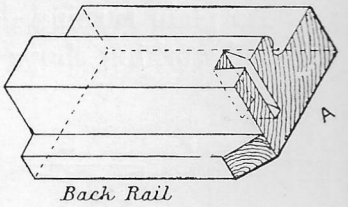


Fig. 1007.—Isometrical Projection of Joint between Solid End and Back Rail

the ends of the case must be reduced by the thickness of the quarter-round member which forms the rebate for glass at the front of the case.

These cases are often fitted with several trays, the bearers to carry them being screwed to the ends.