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Antique Pattern Library

PREFACE.

THIS Handbook contains, in form convenient for everyday use, a comprehensive digest of the knowledge of making and fixing window blinds, scattered over the columns of WORK and BUILDING WORLD—two weekly journals it is my fortune to edit—and supplies concise information on the details of the subjects on which it treats.

Much of the matter contained in this Handbook was contributed in the form of articles by Mr. B. A. Baxter.

Readers who may desire additional information respecting special details of the matters dealt with in this Handbook, or instructions on kindred subjects, should address a question to WORK or BUILDING WORLD, so that it may be answered in the columns of either journal.

P. N. HASLUCK.

*La Belle Sauvage, London,
January, 1907.*

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WINDOW BLINDS.

CHAPTER I.

ROLLER BLINDS.

THIS handbook will describe the making and fixing of many kinds of blinds. Simple roller blinds are in common use, and may well be described first.

For cutting the holland of which a roller blind is made, a bench is necessary. This may be a loose top made of 1-in. grooved and tongued boards, kept together with battens screwed on the under side, and mounted on a pair of trestles. Where shop-blinds and others of a large size are made, the top should be about 12 ft. by 4 ft. 6 in., but for ordinary house blinds 8 ft. by 4 ft. will do.

A wood straightedge is required about the length of the bench and 2 in. wide, and it is as well to have another, 5 ft. long, for short work. The material is cut with a knife of the pattern shown by Fig. 1. The heel B of the knife, or a common metal skewer (Fig. 2) may be used as a scribe.

Some blind-makers hem the side edges, but this is quite unnecessary, except in the case of cut edges, which would otherwise fray. It is urged that the hemming takes the fulness out of the centre and runs up straighter. This, however, is a mistake. When a hemmed blind is two yards or more long, in being wound up the roll gets too thick, thus making it necessary to pack out the brackets. As the holland can be obtained in so many different widths, a little contriving

will generally make it unnecessary to hem the side edges.

In measuring for a blind, the length of the window should be taken from the top bead of the casing to the ledge, and the width between the side beads. The material should be cut 6 in. longer, and should be 2 in. wider. Suppose, for example, the given measurements are 6 ft. by 3 ft. A roll of 38-in. material is laid across the bench at the left-hand end, and the straightedge put on the free end of the stuff, which is rolled to the other end. There should be a straight line marked across the bench about 2 in. from the end, and quite square with the long edge nearest the worker, with which edge the material is kept

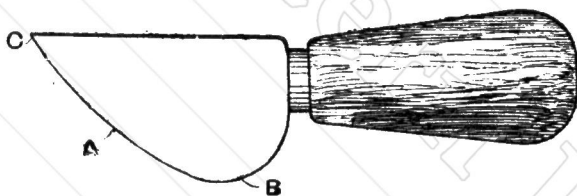


Fig. 1.—Knife for Cutting Holland Blinds.

even; then the wood straightedge must be put to the mark and the cutting edge A of the knife drawn across. This squares the end. Then mark off 6 ft. 6 in., and cut off likewise. The straightedge is then laid on exactly even with the end of the stuff, and the heel B of the knife, which is blunt, is drawn across to make a crease where it is to be folded for the lath hem, about $\frac{1}{2}$ in. of the cut edge being turned in. It is then sewn, and the lath put in. The roller must be $\frac{1}{2}$ in. longer than the width of the blind, to allow $\frac{3}{4}$ in. free play at each end for the material, which should be fixed on with the steel fasteners supplied for the purpose. When the blind is put up complete, and drawn to its full extent, it should still retain at least one turn round the roller. This hides the

ROLLER BLINDS.

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bare wood, but is also needed to give the blind a start to run up. The tassel and cord should be exactly central on the lath, or the blind will not wind straight.

In making a large blind, say, for example, a 10-ft. drop by 9 ft. wide, three lengths of 38-in. material must be cut 10 ft. 10 in., 4 in. of which is allowed as waste in squaring. These are seamed together to make the width, and the selv-edge sewn down flat. In this case, as there are two seams on the stuff, the side edges must be hemmed, turning in sufficient to make the blind the right width. It will now require to be squared. To do this, it is folded once length-wise, bringing the hemmed edges evenly together; then the point c of the knife is used to pierce the



Fig. 2.—Scriber.

hems through, a small cut being made at the left-hand about $1\frac{1}{2}$ in. from the end; from this cut the blind is measured off to 10 ft. 6 in. and the other end cut in the same way. It may then be opened out on the bench, the long straightedge laid on to the marks made, and cut off. The lath hem is then turned up and sewn. Blinds of this description are used chiefly for inside shop windows, and the plain old single-action roller is most suitable.

An alternative method of cutting out holland blinds is as follows: The quantity of holland required is not less than 4 in. more in width than the finished blind, and 9 in. more in length for plain bottom blinds, and from 12 in. to 15 in. for shaped and lace insertion bottom blinds. If the

WINDOW BLINDS.

old rollers are to be used again, the holland must be cut to allow it to finish 1 in. less than the length of the roller between the ends; otherwise the holland will not roll up straight. If new rollers are to be fitted and the reveals are narrow, it is advisable first to make the rollers the extreme length or width, and then to cut the holland to fit. When a number of blinds are to be measured for, it is usual to compile a concise table something similar to the following:—

<i>No. of blinds.</i>	<i>Net width.</i>	<i>Net length.</i>	<i>Name of room.</i>	<i>Extreme measure over ends of rollers.</i>	<i>Remarks.</i>
1	3' 6"	8' 3"	{ Drawing-room.	3' 9"	{ One small blind left-handed.
2	1' 11"	8' 3"		2' 1½"	
1	4' 1"	7' 9"	{ Dining-room.	4' 4"	

The first blind, whose measurements are given in the table, will be taken as an example. A blind 3 ft. 6 in. by 8 ft. 3 in. will require 3 yd. of 48-in. holland. Having cut off the piece required, place it on the bench face downward, and fold it lengthwise, taking care not to crease the centre. Place the selvedge edges as even as possible. With a rule mark off 1 ft. 9 in. (half the finished width) from the folded edge, and prick a small hole through and another 1¼ in. beyond that. Do the same at the bottom of the holland. Make another hole about ½ in. from the top edge, and one at ½ in. from the bottom, with another 2 in. above the bottom hole. When all the holes have been pricked through, open out the holland, and with a straightedge draw lines with a regulator or any blunt-pointed instrument from mark to mark. When all are done, cut off the surplus and fold and crease the side hems, then the ½ in. at

ROLLER BLINDS.

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the bottom, and then the 2-in. piece at the bottom. The $\frac{1}{2}$ in. at the top is cut off to the mark, and it follows that, if the measures were exact

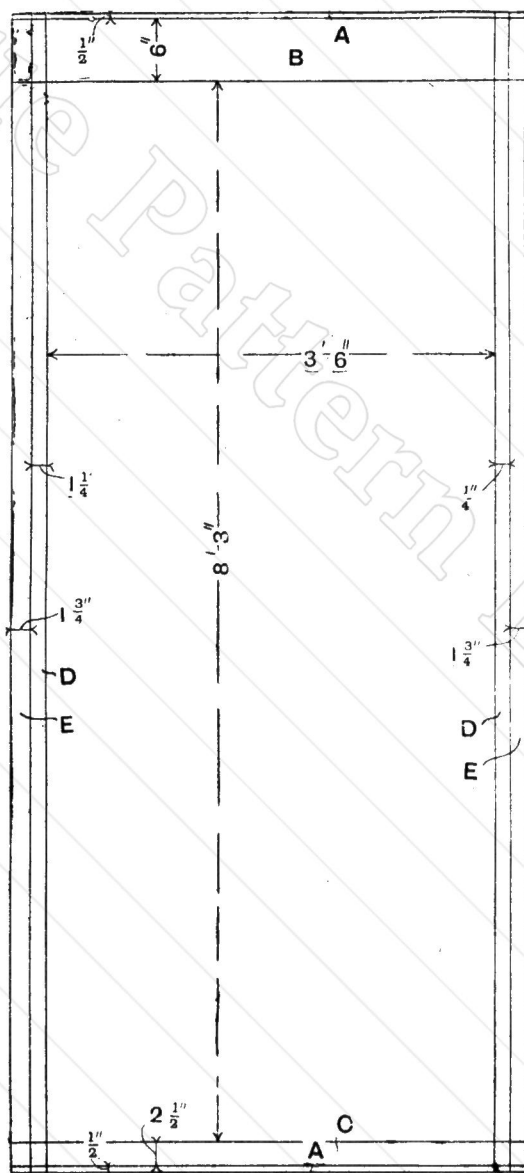


Fig. 3.—Method of Marking out Blind.

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the blind must be perfectly square. The method of marking out will be easily understood by reference to Fig. 3, where A is the $\frac{1}{2}$ in. for folding in at top and bottom; B, piece to go round roller; C, bottom hem; D, two side hems; and E, the waste pieces. Both of the raw-edged side hems of the blind should now be herring-bone stitched, and the bottom hem machined.

The bottom lath, having been cut 1 in. shorter than the width of the blind, should now be sewn in. Now place a round roller upon the bench clear of the ends, and put a strip of wood (a flat blind lath answers) on the bench close against

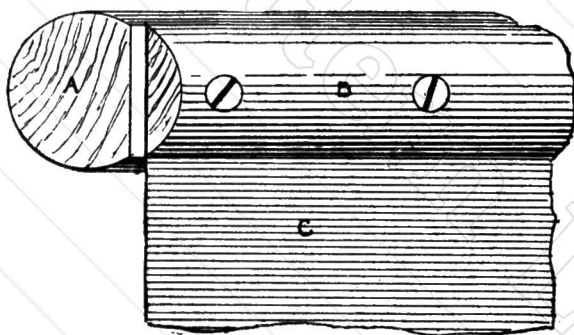


Fig. 4.—One Method of Fixing Blind to Roller.

the roller. Draw a pencil line where the two meet. Then lay the blind face down, the top edge away from the workman, and place the roller on it with the cord end to the right hand. Draw the edge of the blind up to the pencil line, and tack straight with four or five $\frac{3}{8}$ -in. tinned tacks. Turn the roller round towards the worker until the holland covers it, and tack down; the tacks should be about 6 in. apart.

It makes a stronger job to tack on a length of narrow tape or a strip of the holland before attaching the blind, which is thus prevented from tearing away if it happens to run down.

It is much the better method to make a pocket

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for the roller, for the blind is often subject to sudden pulls which may drag it away from the roller if this is simply tacked to the edge of the blind. Also it is much easier to detach the blind from the roller if at any time this is necessary.

Fig. 4 shows a great improvement on the use of tacks for attaching blinds to rollers. For use as shown, a new roller is best, but an old one, quite free from tacks and nails and not too much cut up, will do well enough. It must be cut lengthwise in two pieces, one about twice as thick as the other (see Fig. 4). This operation is best done with a circular saw. Shorten the small

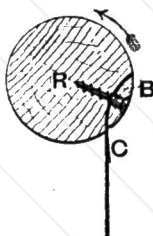


Fig. 5.

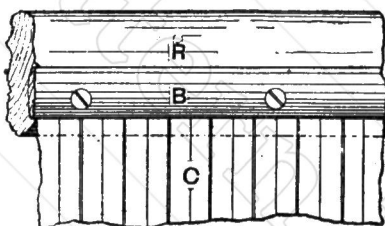


Fig. 6.

Figs. 5 and 6.—Fixing Blind to Roller by means of Batten and Screws.

piece to the exact width of the blind. Double the end of blind and insert it between the two pieces. Keep in position, taking care that the blind hangs true. It may then be secured with three or four small screws. The roller is not cut exactly in half, as one part should be large enough to hold the ends, which are usually fixed with three screws. The other part should stand clear of the ends, so that when it is necessary to detach or replace the blind there will be less trouble in doing it. The saw cut is left rough, giving a better grip for the blind. It will be well to grease the screws before insertion, otherwise removal may become difficult; and care should be taken that the heads are flush with the roller.

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A similar method is shown by Figs. 5 and 6. Take the blind roller as it stands with furnishings complete, and from end to end scoop out enough wood to admit of a batten similar to that which weights the blind when hanging. This batten should be 1 in. broad and $\frac{1}{2}$ in. thick in the centre, and tapered off to both edges. Lay the upper end of the blind—with a narrow fold to give body to the grip—in the groove, place the batten above it, and with about half a dozen screws fix down to the roller. This will hold the cloth securely, and the strain being uniformly distributed the danger of tearing, even when subjected to severe strain, is reduced to a minimum. Of course, the edge of the channel over which the cloth hangs



Fig. 7.—Octagon-section Blind Roller cut from Square-section Wood.

must be rounded off so as to obviate the possibility of cutting.

If a blind-roller is of octagon section (see Fig. 7), it must be of the same circumference at each end, and it should be straight. The same conditions, of course, apply to a cylindrical roller, which, however, being machine-made, will not be so likely to differ at the ends as the hand-planed octagon; although it is just as likely—perhaps even more so—to be crooked. The simplest way to make an octagon roller, is to get the squares machine-sawn, and then to plane them accurately to square section. If half the diagonal is taken for the distance from each arris, the octagon can be produced by removing the four triangles as shown in Fig. 7. The blind-maker, however, seldom takes

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so much trouble; he generally has a **V** trough, in which the square piece of wood is placed, with the diagonals in vertical and horizontal planes, whilst the angles are chamfered with a jack-plane, the amount to be removed being judged by his eye; and if a tape wound round each end of the completed roller shows equal results, he is satisfied.

A blind-roller should have its axis, on which it revolves, fixed horizontally. In an old building it must not be taken for granted that the

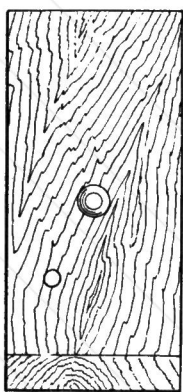


Fig. 8.

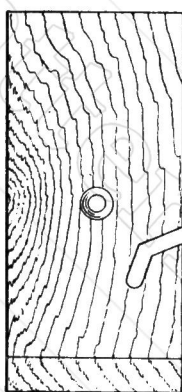


Fig. 9.

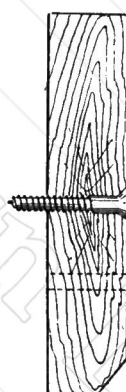


Fig. 10.

Figs. 8, 9, and 10.—Inside Blocks for Fixing Blind Rollers.

soffits are level. When the blind is fixed between the beads, or in the space reserved for the upward movement of the lower sash, blocks are used. These blocks not only serve to support the blind, but also stop the upward movement of the lower sash-frame, thereby protecting the blind from injury. It is always possible to adjust these blocks to a sash-frame that is not true, by making them of different sizes, to ensure the roller being supported horizontally. Figs. 8 to 10 show face and side views of these blocks, which are generally made 3 in. long, $1\frac{3}{8}$ in. wide, and not less than $\frac{5}{8}$ in. thick. Outside brackets (Figs. 11 to 16),

B

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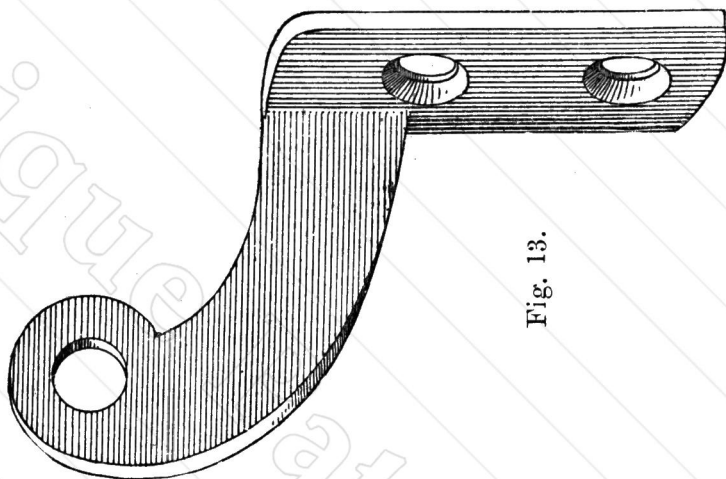


Fig. 13.

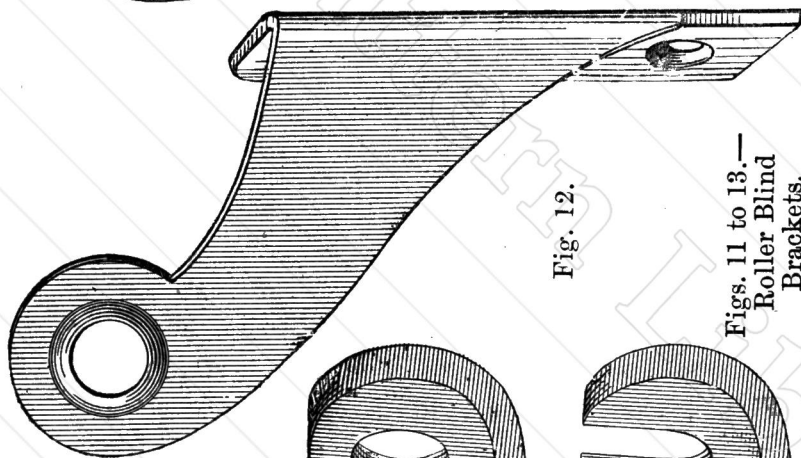


Fig. 12.

Figs. 11 to 13.—
Roller Blind
Brackets.

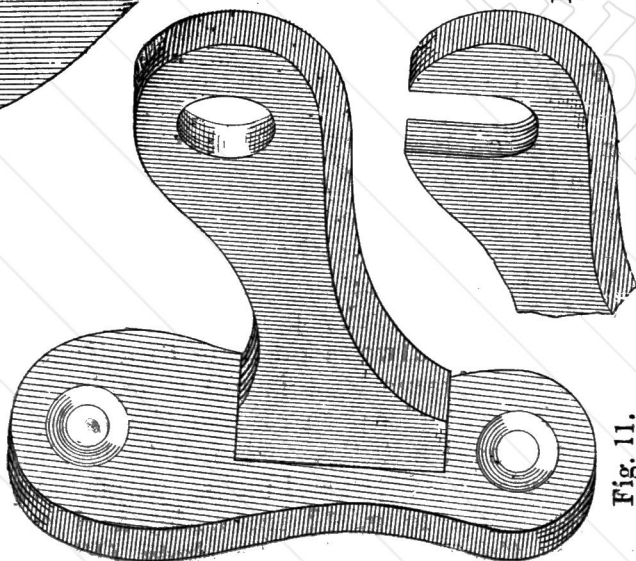


Fig. 11.

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Fig. 16.

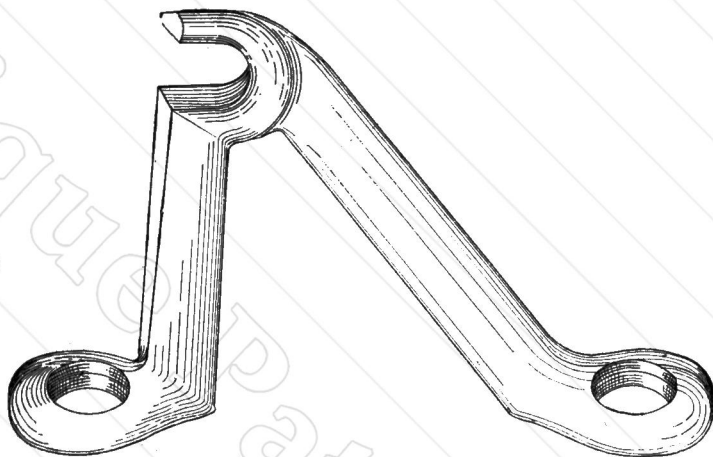
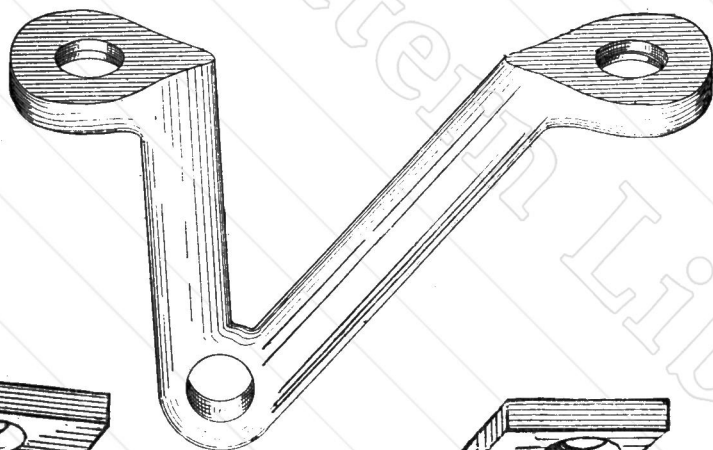


Fig. 15.



Figs. 14 to 16.—Roller Blind Brackets.

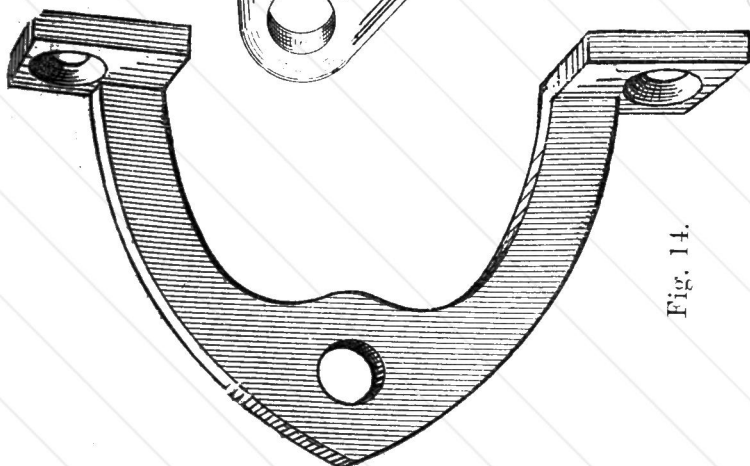


Fig. 14.

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being quite independent of each other, may always with care be fixed at the same level.

The arrangement of a blind upon a roller fitted to brackets attached to a lath that can be fixed to either a vertical or horizontal surface has much to recommend it, because all adjustments can have been previously made, and the lath alone requires to be fixed.

Instead of the wood blocks, brass nipple brackets (as shown in Figs. 17 and 18) are sometimes used; and the plate-bracket (Fig. 19) also. These are always used when the roller is fitted on a lath. When this form of bracket is used, the blind-roller is put in or taken out by springing

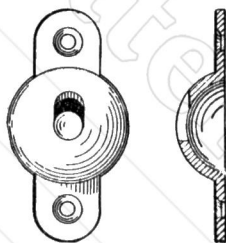


Fig. 17. Fig. 18.

Figs. 17 and 18.—Brass Nipple Brackets for Roller Blinds.

the plates, which are sufficiently elastic to return to their place after the pressure has been removed. The pins in the ends of the roller must in this case be short, and the fit of the roller close, to avoid the necessity of bending the plates to any considerable extent, which would soon permanently alter the distance between them.

A roller-blind is usually drawn up by an endless cord, passing over a V-grooved wheel (Fig. 20) fixed to the roller, and a small pulley (known under the general term of "rack pulley"), shown in Figs. 21 to 26, at the lower end of the loop, made adjustable by various contrivances to secure the proper tension on the cord, a screw and nut often taking the place of the rack.

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Of late years rollers fitted with a flanged heel (Fig. 27) at one end, and having a cord wound the reverse way to the blind, have been much used. With these the blind is raised by pulling the cord, and so unwinding it from the reel; they are called single-line rollers, and are very good if the cord is strong; but should it break, the blind

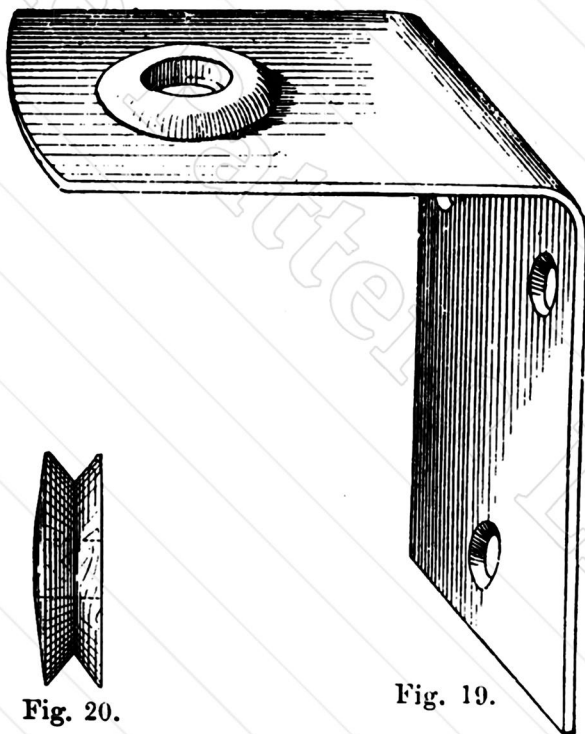


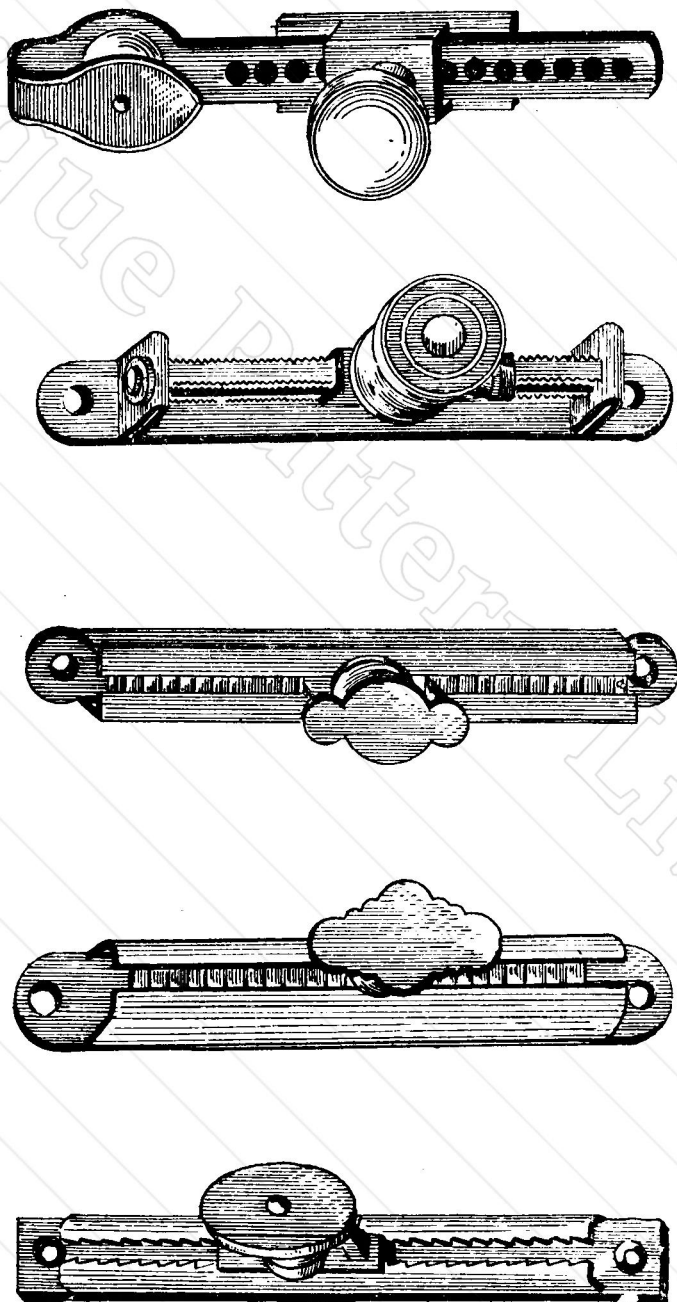
Fig. 20.

Fig. 19.

Fig. 19.—Roller Blind Bracket. Fig. 20.—Boxwood Roller End.

unrolls rapidly, and may tear away from the roller. These single-line reels are used with metal brackets (Figs. 11 to 16), suitable for fixing to a vertical surface, but the plate bracket (Fig. 19) is often used for single-line rollers. The cord used is a small woven flax cord, weighing about 1 lb. to the gross, generally made fast to a Young's patent cord-holder (Fig. 28), one turn of a cord

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Figs. 21 to 26.—Rack Pulleys.

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round this hook sufficing to hold it. When the blind is down, and therefore heaviest, the cord sometimes embeds itself in the coils on the reel in drawing; but the chief objection to single-line rollers is that the flanged reel diminishes the

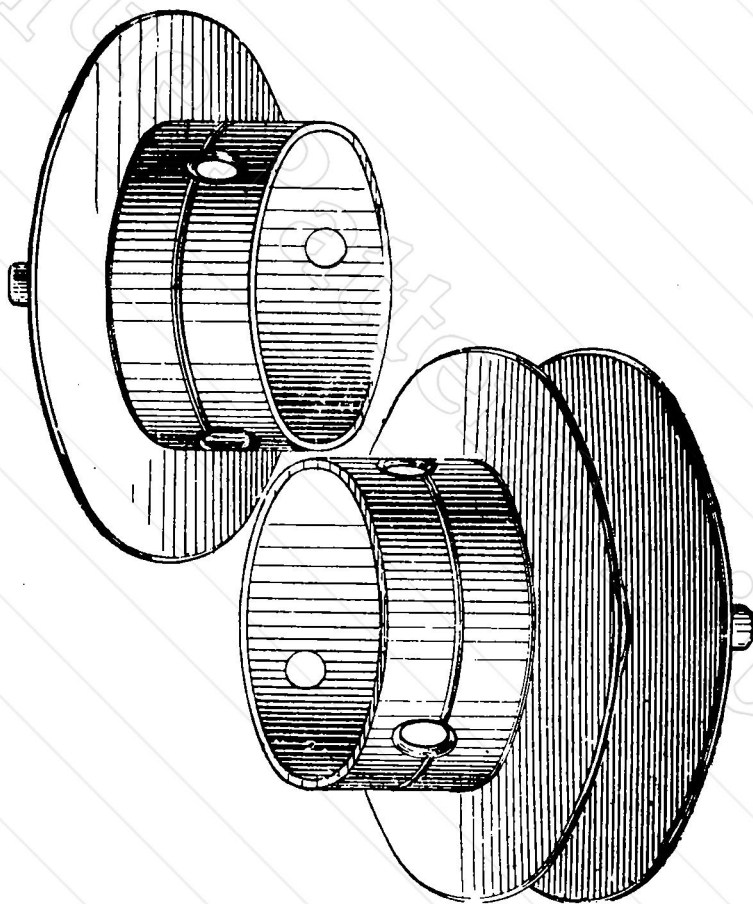


Fig. 27.—Brass Sheath Ends for Roller Blinds.

length of roller available for the blind, which is thereby rendered too narrow when the blind has to be fixed between beads. Wherever it is possible to fix the blind on the face of the sash-frame (and in these days it is generally possible), the single-line roller may be employed by making the roller

as long as the opening between the linings will permit, which will generally give room for the reel and still permit the blind to cover the whole of the glass.

Whenever a blind has a pattern or centre, or any well-defined vertical characteristics, care should be taken that it is hung so that the marked features are central or equidistant from the centre of the glass as well as of the blind. The flanged reel at one end prevents the blind being central on the roller, but the fixing must be so accomplished that the blind is central to the opening in

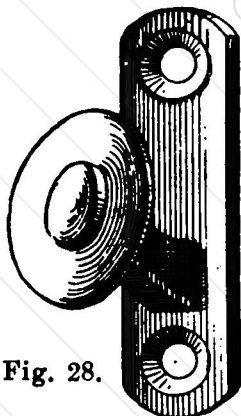


Fig. 28.



Fig. 29.

Fig. 29.—Bottom Lath for Roller Blind (Section).

Fig. 28.—Young's Cord Holdfast.

the sashes. In order to secure this result, striped blinds often require to be cut out of stuff wider than absolutely necessary. In cutting out the cloth, it is customary to allow $\frac{1}{4}$ yd. for covering the roller, making the hem for the bottom lath, and ensuring ample finished length. As to width, blind materials are usually made in widths of 6 in. upwards from 36 in., though plain unions and hollands are sometimes obtainable rising in 2 in. grades. In any case, the selvedge should be cut off and 3 in. allowed for hems, which indicates 5 in. or thereabouts more in width than the finished blind; and in figured or striped blinds the width to be purchased is that which most

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nearly approaches at least 5 in. more than the finished article.

With flower and foliage patterns care must be taken that the hem for the bottom lath (Fig. 29) is not made at the top.

The sewing of the blind is generally done by machine, but the old-fashioned plan of sewing the side hems with a "herring-bone stitch" has much to recommend it, and many of the larger blind firms have machines which imitate this stitch.

If the blind is finished with a shaped end, the cutting of the curved portion should be done while folded, so as to have every curve balanced. The fringe should be put on so that marked features are in the centre or equidistant from it, and it must be put on loosely and without stint.

In fixing the blind on the roller, it is best to use as few tacks as possible, and to sew the blind so as to cover the roller. If straight parallel rollers are used, and fixed horizontally, and the blinds are set out as explained, the result should be satisfactory.

In fitting a large inside blind to a shop window, it is important that the roller should be as straight as possible. Sometimes, however, even a straight roller will warp, on account of the heat from the sun or from artificial lighting. The weight of the blind on such a long roller (generally from 9 ft. to 12 ft.) is also a factor, causing it to droop in the middle, and making the blind, if it runs at all, to jump with every revolution of the roller. The roller should, therefore, not only be perfectly straight, but also made of straight-grained light deal, quite dry and free from knots. For a blind 9 ft. wide, it should be $1\frac{1}{2}$ in. in diameter. The most suitable fittings are those known as a "single action;" with these the blind has to be pulled up, but will come down by merely detaching the cord. The fixing for the left-hand end of the roller is a brass cap with

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a flange and pin, the right-hand one being similar, but with two flanges. The brackets must be screwed in place at such a distance apart as to allow the roller to run loose; and the shade, with the lath in the hem, should be tacked on to hang plumb with the window. It is then rolled up, and the cord attached between the flanges of the right-hand fixing, by passing it through a hole in the pin and putting a knot at the extreme end. It is guided to a convenient place for handling by screw-eyes; and a loop is made on the cord to loop on a stud fixing, screwed at a handy place on the adjacent woodwork. The lath will require to be of sufficient weight to bring down the blind on the cord being unlooped from the stud; if it is not, it may be weighted by tacking on a strip of sheet lead. It may possibly be found that the blind does not run up straight, and as it is plumb with the window when down, it cannot be altered on the roller. This can be remedied by folding a piece of paper to about 3 in. long by $\frac{1}{2}$ in. wide by $\frac{1}{8}$ in. thick, and tacking it on the roller at the end from which the blind recedes. For extra wide windows, it is better perhaps to have two blinds. This is quite straightforward when the glass of the window is divided down the centre with woodwork, as this hides the division between them made by the space taken up by the fittings. When, however, this gap is objectionable, it is necessary that the end of one blind should pass that of the other. Packing out the brackets of one blind with wood blocks will enable this to be done, but a perfectly uniform job is not practicable.

It should be mentioned that about twenty of the blocks illustrating blinds and blind fittings used in this book have been kindly lent by Messrs. Tidmarsh & Sons, of Transenna Works, Upper Street, Islington, London, N., a firm that has made a name for itself in the window blind trade.

CHAPTER II.

SPRING BLIND-ROLLERS.

SPRING blind-rollers are made of a steel case, or barrel, of diameter according to the size of blind, from about $2\frac{1}{2}$ in. diameter for lengths of about 7 ft. to 4 in. diameter for long rollers, say 16 ft. long.

The barrels are a speciality. Inside the barrel is fitted a round iron rod, or two rods, one at each end, of $\frac{1}{2}$ in. to $\frac{3}{4}$ in. in diameter; the external ends project from the end of the barrel about 1 in., and the cylinder is reduced by filing to a square section. This squared end rests in a square hole cut in a piece of stout iron fixed to the inner surface of the blind box; the iron, therefore, does not turn with the roller. The iron rod is "cambered" or bent upwards, in most instances, for a purpose which will be explained presently (see Fig. 30). In order to prevent the barrel moving sideways on the rod, two collars are fixed upon it.

The ends of the barrel are closed by turned blocks of beech (Figs. 31 and 32), which should be well seasoned. In order to secure this, the blocks should be cut out in the rough, rather larger than required, a hole bored through, and then kept either square or roughly turned, and finished only when perfectly dry; this is of great importance. The larger blocks should be fitted with brass nipples (Figs. 33 and 34), bored to allow the rod to fit just freely in them.

The spring is made of "charcoal spring wire;" such wire is specially drawn for this purpose, and varies in size. The springs can be made by wind-

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Fig. 30.—Rod for Shop Roller Blind.



Fig. 31.

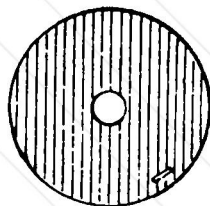


Fig. 32.

Figs. 31 and 32.—Beech Block to fit Roller.



Fig. 33.



Fig. 34.

Figs. 33 and 34.—Brass Nipple for Blocks.

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ing the wire on a mandrel or cylinder revolved in the lathe, or by a hand winch, the mandrel being about one-half the diameter of the tin barrel. The coil of wire must be placed upon a reel or frame, free to revolve as the wire is wound on the mandrel, and care must be taken to ascertain that the coils are free, and that the right end of the wire is used so that it will come off freely.

In winding the spring, some adroitness is needed to guide the wire so as to make a close coil without overwinding or kinking, or varying the control exercised by the hand over the sometimes refractory wire. It is advisable to wear stout gloves and a jacket with sleeves while winding the springs. When enough wire has been wound the lathe or spindle should be allowed to reverse, which it will do with great promptness; if a handled spindle is used, the handle may reverse and strike the workman if he is not careful. The wire can then be cut off, and the spring removed from the mandrel; it will be found that it fits very loosely upon the mandrel now, and that the number of coils will be considerably less than before, though each coil will be of proportionately greater diameter. The amount of shortening resulting from the spring uncoiling thus should be noted; it is about twice as much as should be expected of the spring in use, and the revolutions made are also twice as many as the spring can be trusted to make when winding up the blind. Sometimes two, or even three, springs are required, and in the case of long rollers, where there are two rods, it may be that two springs are required at each end. A short roller required to carry a long length of cloth will need two springs, while a long roller which has to draw a wide but short cloth had better have a stout single spring at each end. One end of the spring is made fast to the rod, and the other to

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the block which fits in the end of the steel barrel. If two springs are required at one end, they may be similar; then the ends of both may be fixed to the rod together, and the other ends to the same block, but if the object is to gain the effect of length rather than strength, the springs are wound one left-handed and the other right-handed, and the spring of smaller diameter has one end fixed to the rod and the other end fixed to one end of larger spring, and the other end of this is fixed to the block. When two springs are thus connected the difference in diameter must be enough to allow both to work freely, and the

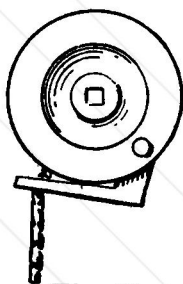


Fig. 35.



Fig. 36.

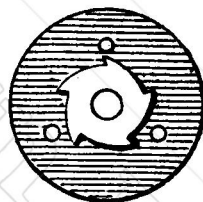


Fig. 37.

Figs. 35 and 36.—Cap for Inside Blind Roller. Fig. 37.—Rack of Inside Blind Roller.

smaller spring should be of rather finer wire than the outer spring.

In all cases the spring must be so made and fixed that the drawing down of the blind—that is, uncoiling the cloth from the roller—winds up the springs or coils it closer. In inside blinds the roller is of smaller diameter, and is usually fitted with a rack and cap (fig. 35 to 37); these prevent the action of the spring when drawing the blind up when it is intended that it shall remain down. A cord is attached to the lever, which engages in the ratchet teeth, so that the spring can be allowed to act at pleasure; an arch spring keeps this lever in contact with the teeth at all times, except

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when the cord is pulled. Fig. 38 further illustrates this, and shows clearly what is meant.

Shop blinds, conservatory, studio, and similar blinds, are usually made with spring rollers, without the rack and cap.

It is important to mention that rollers without the rack and cap must have some distinguishing mark, so that they may be fixed correctly. Such a mark is shown in Fig. 39; it indicates the end where an ordinary—that is, a right-handed—rack and cap would be fixed, such as that drawn in the figures. It is obvious that a rack and cap

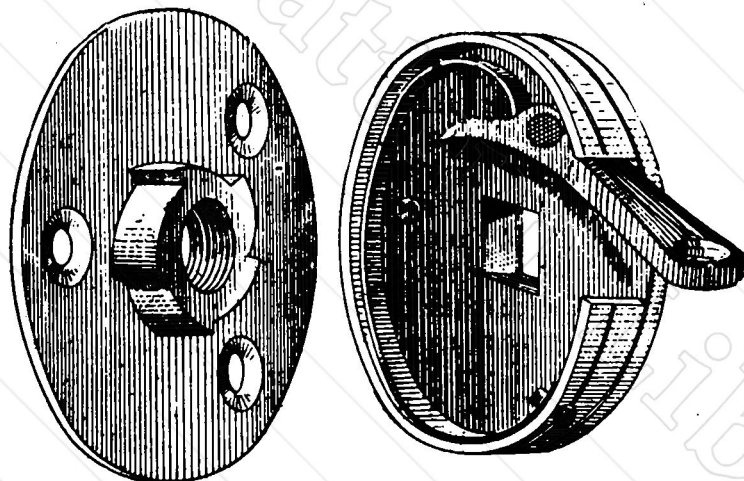


Fig. 38.—Brass Cap and Rack for Spring Roller.

might be put at either end, but if so, the lever and rack would have to be made differently, with the inclined faces of the teeth reversed, but the blind and the spring would remain unchanged.

In shop spring rollers, where two separate rods and springs are used for one roller, one spring is wound right-handed and the other left-handed, and the inside blocks are fitted loosely into the barrel, so that they can be pushed along as far as needed by the rod itself, and can be made fast by three screws fixed through the tin barrel from the

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outside into the block. On the rod shown in Fig. 30, the two collars for one of such a pair of rods are shown; the blocks should almost touch the collars; very little liberty is needed, and too much would be a disadvantage. The eye in the rod (Fig. 30) is intended to make fast the end of the spring wire, which is inserted and twisted tightly round the rod. The other end, if a single spring, is inserted in a hole in the block, which is shown in Figs. 31 and 32. It is then bent back and driven in flush to the surface of the block.

In large rollers (and the best made) brass nipples (Figs. 33 and 34) are affixed to the inner surfaces of the blocks, so that the contact of the metal collars with wood is avoided, and the brass nipple takes the friction instead. Such a nipple also preserves the hole in the block, since the metal can be bored so that the rod fits it easily, and the wood can be bored slightly larger, so that the iron rod need not touch the wood at all.

It is customary to camber all rods more than about 3 ft. long; this is done so that the coils of wire shall not rest upon the inner surface of the lower part of the roller, but upon the iron rod instead. It will thus be seen that the curvature required is slight, being limited by the diameter of the roller, and the necessity of allowing freedom for the wire thus supported. It is important to notice that the ends of the rod must be in line just as truly as if the rod had not been cambered; therefore, by all means make sure of the straightness of the ends before fixing the spring upon the rod (see Fig. 40).

The fact that a rod is "cambered" is indicated by a file-mark upon the top side of the square end of the rod (see Fig. 41); in the fixed roller this mark must be upwards, or the effect of the cambering will be lost, or rather will be even harmful.

For smaller rollers for inside work. the spring

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Fig. 40.—Cambered Rod.



Fig. 41.—End of Rod Notched to show Top.



Fig. 43.—Charging Iron for Spring Roller.



Fig. 42.—Dovetail Cut for Fixing Spring.

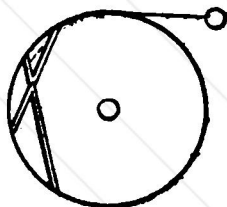


Fig. 39.—Mark to show Right End of Blind Roller.

is fixed in a dovetailed notch (Fig. 42), cut with a metal saw, in the rod; this notch is cut downwards about as deep as the thickness of the wire, and widened sideways until the wire will just push into the notch; a couple of blows with a hammer and two or three close twists of the wire round the rod complete the fixing.

Spring wire is often so hard as to break when bent abruptly; when this is so, make the ends hot in a lamp or gas-flame, to soften it.

In cases where two springs are bound together, the ends of each are bent into a loop, disturbing the coils of the spring as little as possible; the loops are made to engage with each other, and one or two coils are wrapped and tied together with binding wire.

Assuming a spring roller to be at hand, it is first of all fitted into the box or bracket fixings intended for it. The spindle or rod must not be constrained endways; if all is right, the cloth may be attached (Fig. 39 will show how it is to go) on a properly marked roller. Of course, rollers having a rack and cap can scarcely be fixed wrongly; the rack and cap shown by Figs. 35 to 37 are suitable for fixing on the end marked with the cross, and are to be to the right hand of a person facing a room window at which it is intended to be fixed. In fixing the cloth, a line is ruled upon the roller, and the blind brought to the line and tacked with wrought tacks to the roller only where the blocks are situated; the rest of the fixing must be done by sewing.

Some persons make the blind wrap round the roller the reverse way, and obtain thereby a pair of folded edges; this makes a nice straight line to sew to, and if the precaution has been taken to wind a strip of web or tick spirally round the roller, and to sew into it as well as the blind, all will be satisfactory.

Charging the spring consists in winding the

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spring a few turns; it must be remembered that drawing the blind down increases the charge, so care must be taken to avoid overwinding the spring. There are two ways of charging the spring—either the rod may be wound the reverse way with the charging iron, shown in Fig. 43, or its equivalent; or the roller with the blind attached may be put into the place prepared for it, having the blind rolled up smoothly, and a few ties of cord to prevent it unwinding; the roller may then be made to revolve in the same direction that it would in unrolling the blind. When it is judged that the spring has been wound enough (six to twelve turns ought to be sufficient), the tick can be affixed to the bottom lath with a few tacks here and there, and the ties taken off. In inside blinds the charging is more easily accomplished, owing to the assistance afforded by the rack and cap. The tendency of beginners is to charge the spring too strongly, forgetting that unrolling the blind winds up the springs, and that the weight of any fittings to outside blinds helps the drawing down. On the other hand, a spring roller charged too slightly is apt in time to give some trouble, especially if the blind gets wet.

Such additional charging as may then be required is done with the iron shown in Fig. 43, rather than by untacking the blind from the bottom lath. This charging iron needs great care in using, or it will fly off the square, and may do some injury to the workman or damage to articles in the room.

When rollers have two separate spindles, care is required to charge both ends equally, and if removed from the brackets, the roller must be replaced with strict attention to the mark which indicates the top side of a cambered spindle. In order to allow of this mode of charging the roller at any time, many blind-makers prefer the supporting plates or brackets to be made alike, so

that either end of the roller can be lifted up and out at pleasure.

The fixing of the collars shown in Fig. 30 will, of course, be done by the smith, but for shorter and smaller rollers, brass collars can be obtained, and can be reamed to fit the iron rod, and fixed by striking up with a chisel each side of the collar (Figs. 44 and 45). When a rack and cap are used, only one collar is necessary; this collar in the finished roller is in close proximity, or free contact, with the projecting inner surface of the block (Fig. 31).

The squared end of the rod should fit the square hole in the cap (Figs. 35 and 36) rather tightly, and the cap is fixed by one or two slight



Fig. 45.



Fig. 44.

Figs. 44 and 45.—Fixing Collars.

dents made by a cold chisel, these dents having the effect of riveting the spindle or rod to the cap. It will be seen that this mode of fixing the cap serves to keep the spindle from any lateral movement, and avoids the necessity of fitting two collars.

A little oil is of benefit to the springs, but any applied to the spindles must be of a non-drying character.

A typical repairing job will now be described. A spring roller-blind is to be lengthened from 8 ft. to 14 ft. The best thing to do is to make the spindle or rod in two pieces, preferably of equal length, and each carrying a spring, which must be wound in opposite directions, taking care to mark the end and mounting the cloth so that drawing the blind down winds the spring

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tighter. The addition of another spring, so as to lengthen the existing spring, is not what is wanted, as 6 ft. is ample length for the springs. In connecting the parts of the roller together, it is necessary to remember to "camber" the rod, to keep the ends that pass through the blocks truly in line, to mark the rod so as to keep the rise in camber up, to support the spring, and that each spring must be so attached to the rod at one

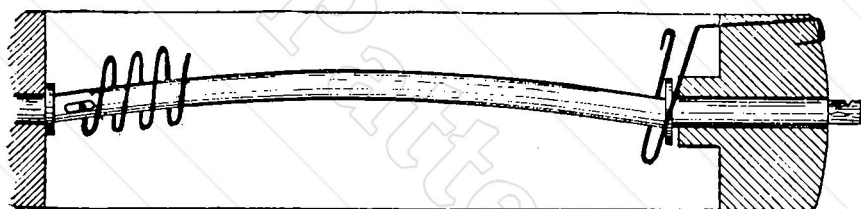


Fig. 46.

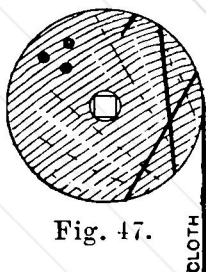


Fig. 47.

Figs. 46 and 47.—Section and End View of Spring Roller.

end and to the block at the end of the roller that it will bear the required number of turns without binding, for every turn of the roller lengthens the spring by the diameter of the wire. Charcoal spring wire is required, and if wire one size larger than the existing spring is used, it would be justified by the increased weight of cloth the lengthened roller has to carry. A long spring is not stronger, but it is more gentle and durable, and gives more uniform tension than a short one; and it is more suitable for a long draw of cloth.

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When winding the spring, notice how many turns the mandrel makes when tension is relaxed—it is the limit of safety for that spring. Lastly, be sure that the joined barrel is truly straight, and that there is room in the blind-box for the cloth without coming in contact with the box. The cloth must be square, and the hems must be straight and equal. If the blind as well as the roller has been altered in size, it may be that the new part is not the same substance as the



Fig. 48.—American "Hartshorn" Wood Spring Roller with Brackets.

old, in which case difficulty will arise when the blind is mounted. Fig. 46 represents a section at the right-hand end of the spring roller, showing camber of rod, and Fig. 47 an end of the roller, showing the methods of indicating the right, or rack and cap, end.

It should be mentioned that many inside blind-rollers are of wood, not of steel, as instance the American "Hartshorn" wood spring roller, shown, with its brackets, by Fig. 48. The wood roller is bored out for its entire length, so forming a barrel.

CHAPTER III.

VENETIAN BLINDS.

IN the construction of Venetian blinds, special care should be exercised in the selection of the wood, as sudden variations of temperature to which the blinds are subjected render them very liable to twist and warp. It is best to buy the blind laths from firms that make a speciality of converting and seasoning timber for this purpose.

Yellow pine is the wood most commonly used for making Venetian blinds, but whitewood (also known as basswood) gives very satisfactory results.

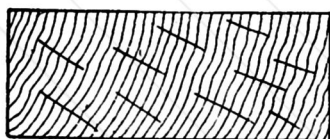


Fig. 49.



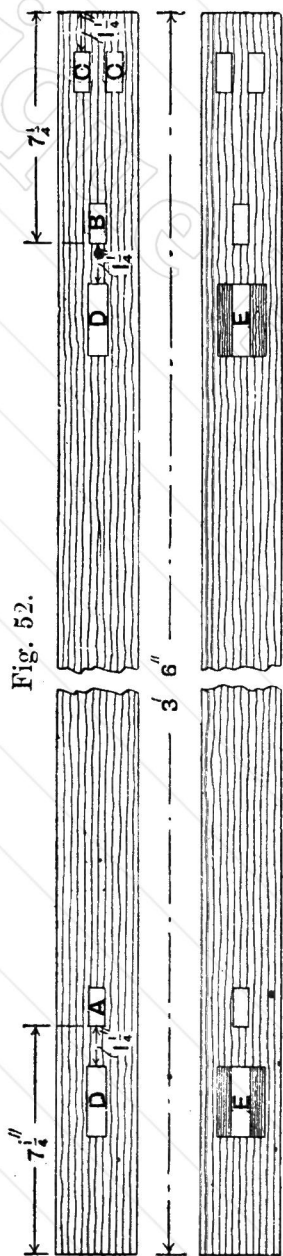
Fig. 51.

Fig. 49.—Section of Pulley Head for Venetian Blind. Figs. 50 and 51.—Sections of Laths for Venetian Blind.

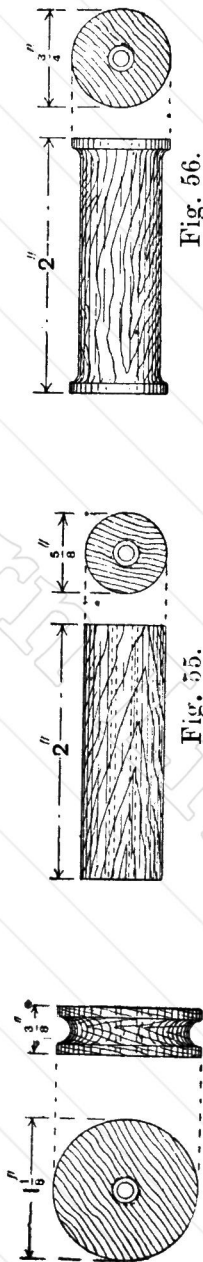
Blind laths are sold in bundles of 480 ft. run, averaging from 9 ft. to 13 ft. long, and costing from 9s. to 10s. 6d. per bundle, the latter price being for special selected stuff for plain varnishing, and showing a certain amount of figure. Shorter lengths can be bought cheaper, but generally entail a great deal of waste.

A Venetian blind consists of the following separate parts: One pulley head, which carries the winding and hanging apparatus; one each of top and bottom thick laths, from which the ladder tapes are suspended; and the thin laths which form the blind proper, and which vary according

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Figs. 52 and 53.—Top of Head of Venetian Blind Set Out.



Figs. 55 and 56.—Tape Rollers for Venetian Blinds.

Fig. 54.—Pulley for Venetian Blind.

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to the length of the blind, the average being about eight laths per foot.

Pulley heads are $2\frac{1}{2}$ in. wide, by 1 in. thick. Thick laths are $2\frac{1}{2}$ in. by $\frac{1}{2}$ in., and thin laths $2\frac{1}{2}$ in. by $\frac{1}{4}$ in., all finished sizes. Sections of all three members are shown in Figs. 49 to 51; two are shown with beaded edges, as is usual with ready-made laths, although not absolutely necessary.

To make a long Venetian blind for a window the inside measurements of which are 3 ft. 6 in.

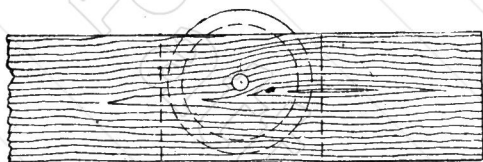


Fig. 57.

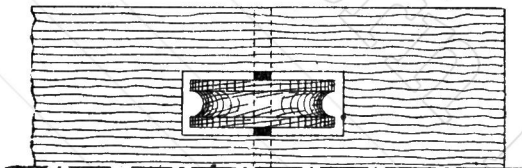


Fig. 58.

Figs. 57 and 58.—Mounted Pulley of Venetian Blind.

wide by 6 ft. long, first get out the pulley head, which should be dressed up to $2\frac{1}{2}$ in. wide, 1 in. thick, and 3 ft. 6 in. long. Set a gauge to $1\frac{1}{4}$ in., and mark down the centre on both sides. Then mark off, to the dimensions shown in Fig. 52, the pulley mortises A B and C C, and work them out square and clean, each mortise measuring $1\frac{1}{4}$ in. long by $\frac{1}{2}$ in. wide. Next mark off roller mortises D D (Fig. 52). These are $2\frac{1}{4}$ in. by $\frac{5}{8}$ in., worked through. Turn the head over, and mark the roller mortises on one side of the head only $1\frac{1}{2}$ in. wide; then bevel off from the $1\frac{1}{2}$ -in. marks to the $\frac{5}{8}$ -in. on the other side (see E E, Fig. 53), so as to allow the hanging tapes to swing.

WINDOW BLINDS.

Four pulleys and two tape rollers are required (see Figs. 54 to 56). These can be purchased ready made in beech, box, or lignum vitæ, and cost only a few pence per dozen. The best kind

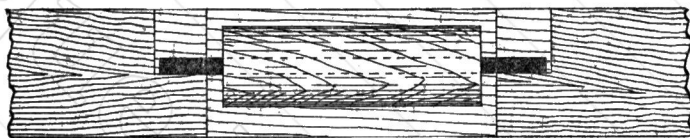


Fig. 59.

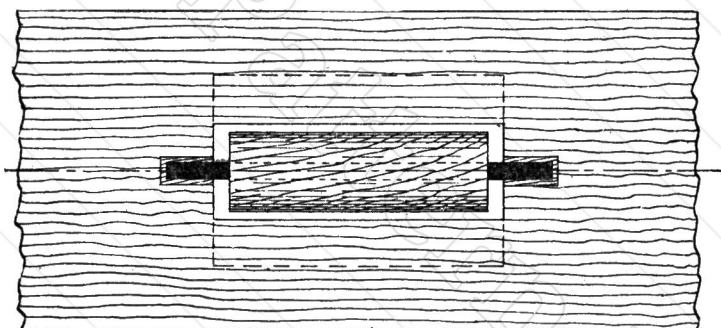


Fig. 60.

Figs. 59 and 60.—Mounted Tape Roller of Venetian Blind.

have the holes bushed with brass tube, and the edges of the tape rollers flanged, as shown in Fig. 56. The pulleys are mounted on bright iron pins, $\frac{1}{8}$ in. thick, the holes being bored $\frac{3}{8}$ in. from the top, and exactly opposite the centre of the mortise (see Figs. 57 and 58). One pin is sufficient



Fig. 61.—Hook for Venetian Blind Tape Roller.

for the double pulleys, and is carried through the head. The pins for mounting the tape rollers are 3 in. long, and a common method is to sink about $\frac{1}{2}$ in. at the end into grooves cut at each side

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of the mortise (see Figs. 59 and 60), this groove being $\frac{1}{2}$ in. deep. The pin is secured by two small staples. This method, however, causes the pulley head to be very weak at this point.

A much better practice (illustrated by Fig. 61)



Fig. 62.—Transenna Tape Roller.

is that of mounting the roller on the iron wire, and turning the ends hook-shaped, as shown. No grooving is then necessary, as the hook, with roller attached, is placed in the centre of the mortise and driven into the pulley head at each end.

The Transenna tape roller (Fig. 62) has brass flanges to which the pin is riveted, the roller being inserted in the head merely by screwing the flanges to the head.

Two methods of hanging or securing the actual

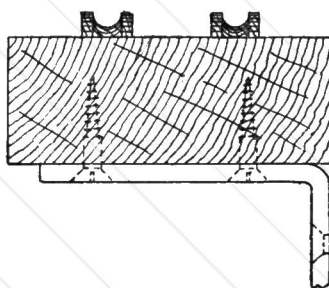


Fig. 63.—Method of Hanging Venetian Blind by Brackets.

blind are illustrated. Fig. 63 shows the pulley head fixed on malleable iron brackets. These brackets may be of the shape shown in Fig. 64; they are screwed to the sash-frames. Fig. 65 shows the pulley head made in the form of a trough by brad-

WINDOW BLINDS.

ding on two thin strips of wood, so that the pulley head can be screwed into the top part of the window casing, leaving nothing to interfere with

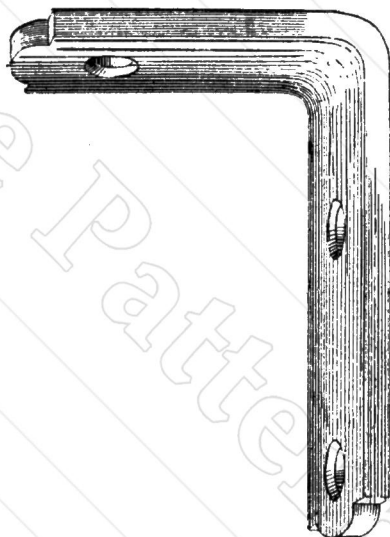


Fig. 64.—Iron Fixing Bracket for Venetian Blind.

the free running of the cords. This method is far preferable to that in which brackets are used.

The top and bottom thick laths can now be got

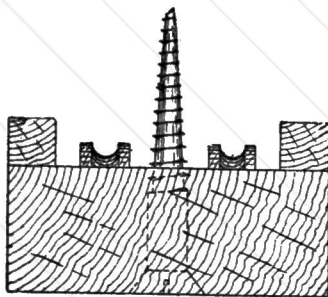


Fig. 65.—Section of Pulley Head showing Fixing Screw and Bradded-on Strips.

out. These are $\frac{1}{2}$ in. thick by 3 ft. 4 in. wide. An inch each side off the length of the pulley head

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must be allowed for clearance, as blinds of the full width are very liable to jamb, no matter how carefully they are hung. The bottom thick lath has two $\frac{3}{8}$ -in. holes bored for the winding cord to

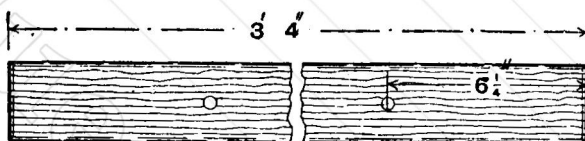


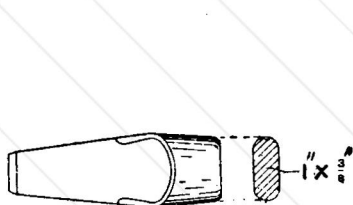
Fig. 66.



Fig. 67.

Fig. 66.—Bottom Thick Lath of Venetian Blind Bored.
Fig. 67.—Top Thick Lath of Venetian Blind Slotted.

pass through; these are $6\frac{1}{4}$ in. from each end (see Fig. 66). The top thick lath and all the thin laths have a slotted cord-hole, 1 in. by $\frac{3}{8}$ in., and $6\frac{1}{4}$ in. from each end (see Fig. 67). Special punches are sold by tool dealers for this purpose. The one shown by Figs. 68 and 69 is placed on the lath and struck with a heavy hammer.



Figs. 68 and 69.



Fig. 70.

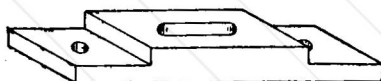


Fig. 71.

Figs. 68 and 69.—Hand Blind Punch. Figs. 70 and 71.—Fitment and Die for Mortising Machine.

In sharpening these hollow punches, give a long bevel to the cutting edge, as a short bevel is

very apt to split the wood through insufficient clearance. These punches cost about 2s. 6d. each. Special machines are made for slotting blind laths, and a slotting attachment to an ordinary mortising machine is shown in Fig. 70, the slots being made by pressure instead of cutting. The die (Fig. 71) can be bolted to a block of hard wood with a hole bored through for the blanks to pass, and this can be cramped to the machine bed.

When all the laths have been slotted, the colouring can be done. Of the three methods of coating Venetian blinds, that of plain varnishing simply consists of applying oak varnish directly to the laths; that of flatting consists in colouring with water stains, bound with a medium such as ground glue, plaster-of-Paris, etc., so producing a dead

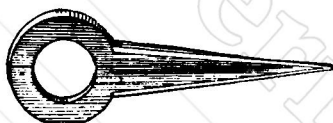


Fig. 72.—Venetian Driving Eye.

flat colour, which is capable of standing variations of temperature without blistering or peeling; while the other method is that of painting, which is usually finished by a coat of oak varnish to give a glossy surface, or the combined paint and varnish (enamel) can be put on in one operation, no priming then being necessary. Linseed oil should be used sparingly for Venetian blind paints. The commonest colours in use for painting Venetian blinds are greens, fawns, pale blue, and drabs.

The colour having been allowed time to get thoroughly dry, the blind can be mounted. This operation is best done on a large flat table top or bench.

The materials required for mounting, are: 13 ft. of ladder tape, 12 yd. of glacé blind cord, one driving eye (Fig. 72), and 1 cord holdfast

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(Fig. 28, p. 24). Venetian blind ladder-tapes are stocked in six different sizes; the usual form of tape is illustrated by Fig. 73. The size required for $2\frac{1}{2}$ -in. laths is $1\frac{3}{4}$ in. between each pair of cross straps, and the cross straps are $2\frac{1}{2}$ in. between the side tapes. Carr's and the "Owl" brand are very well known, and cost from 3d. to 4d. a yard retail; or, in half-gross rolls, from

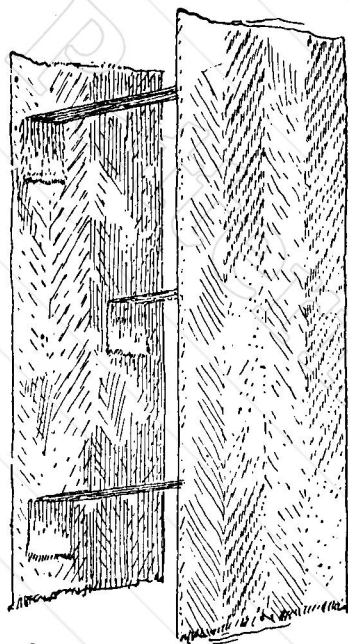


Fig. 73.—Woven Ladder Tape.

22s. to 25s. a gross. The stock colours are : Brown duck (unbleached), white, green, crimson, and buff; other colours can be got to order. A solid linen blind cord, averaging $2\frac{1}{2}$ lb. per gross ball, costs from 3s. to 4s. 6d. per ball; or, retail, 1d. per yard.

To begin mounting, first fix the turning cord a (Fig. 74, which is a part general view of the blind when hung). This is 2 yd. long, all in one piece. The two free ends are tacked to the top of the

thick lath, $\frac{1}{2}$ in. from the end. Before tacking, thread the cord through the driving eye (Fig. 71). This cord is for the purpose of turning or leveling the blind laths as may be required. Next lay the top lath on the pulley head, and mark off the positions of the hanging tapes B B. Special tape for this purpose is made, but it is difficult

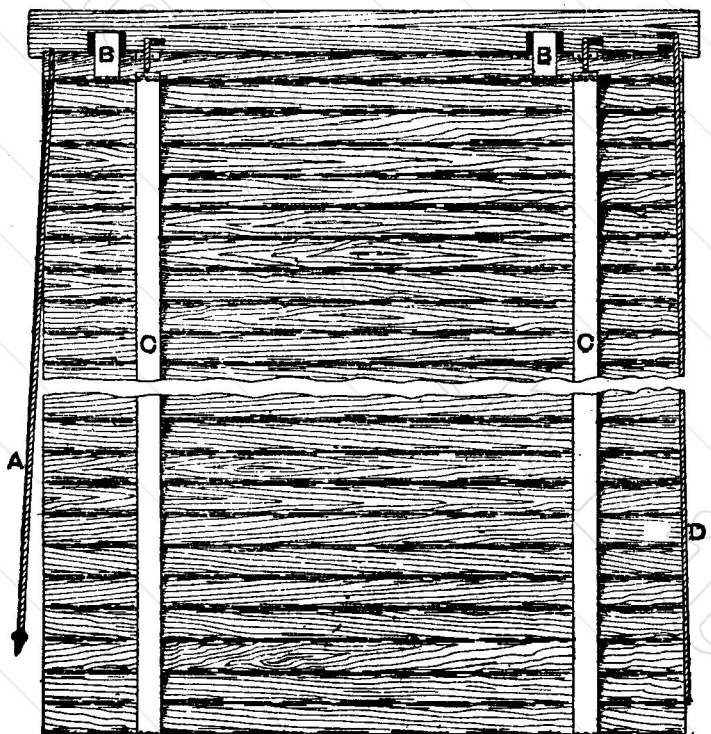


Fig. 74.—General View of Venetian Blind when Hung.

to get, the usual method being to cut off a piece of ladder tape 8 in. long; then cut off the cross straps; and the two side pieces can be used for the hanging tapes. One end of each of these having been tacked in the centre of the under side of the lath, both are drawn over the rollers, and the ends are butted to each other. Both tapes must have the same amount of swing, and the top lath and pulley head must be parallel.

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The ladder tapes c (Fig. 74) are next put on. These are tacked at each end of the slots in the top and bottom laths, the latter being tacked fast underneath.

When the blind is hung, the tapes will cover all the slots from top to bottom. The edges of the tapes are usually finished by a few brass studs, as shown. The skeleton blind can now be hung full.

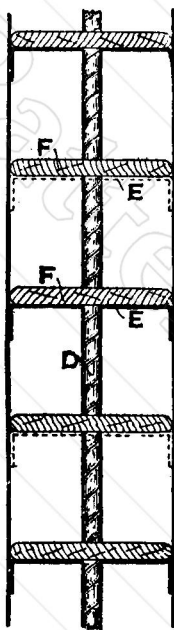


Fig. 75.—Position of Winding Cord and Cross straps for Venetian Blind.

length against a wall, or suspended from a ceiling, when the thin laths can be placed in position.

The winding cord D is about 9 yd. long. Take one end, thread it up over the nearest pulley, then along the head and down the first pulley, then through the slots. The cross tapes or straps supporting the laths should be alternately on each side of the winding cord. Let the cord come out on the under side of the bottom lath, then tie a knot.

D

The other end of the cord is laced up the next pulley and down the other side of the blind, and is knotted as before. Fig. 74 will make this description clear.

The winding cord *D* and cross straps *F* at each side should be in the position shown at Fig. 75 when laced up. The laths are shown at *E*. The cross straps that are dotted show the alternate positions.

The winding cords must be tried, and any binding or obstruction remedied. Wind up the blind until the laths are close together, then tie them up tight for convenience in handling. The knot of the cord at the bottom lath will look un-

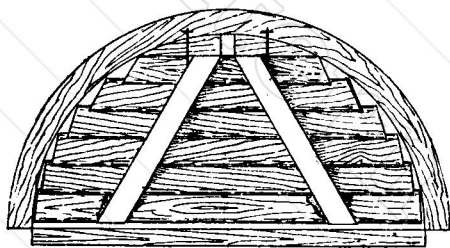


Fig. 76.—Dummy Venetian Blind for Circular-headed Window.

sightly if left as it is. There are several methods of improving it. One is the addition of a decorated brass plate, the centre being dished out to cover the knot, and fixed with brass screws. Another is to fit on to the cord, before the knot is made, a stamped brass star, something like the head of a large picture-nail, which is secured with the knot. Both of these can be purchased from wholesale blind-makers. A cheap and efficient method is to let the ladder-tapes lap over to the opposite edge of the bottom lath and finish with brass studs.

In hanging the blind, care must be taken to have the pulley-head level, otherwise the blind will look askew. Fix the brackets on the casings,

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then rest the blind by the pulley-head on these; place a level on the top and adjust as may be needed. Then screw the head fast, place the cord holdfast in position, and knock the driving eye, which is laced on the turning cord, into the casing at the left, the winding cord being on the right. Take hold of the winding cord, then cut the strings that hold the blind together and gently let it down. Any defect in the hanging or winding will now be seen, and must be remedied at once.

Wind up the blind to within 2 ft. or 2 ft. 6 in.

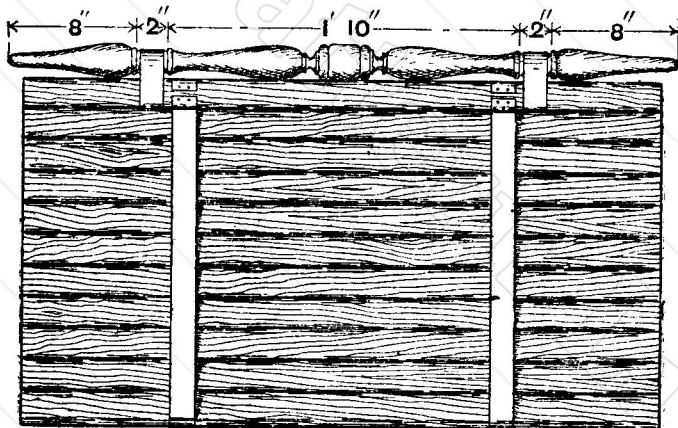


Fig. 77.—Short Venetian Blind with Roller Head.

from the top, then knot the cord so that the hang will be permanent. If a number of windows in one building are being fitted, all the blinds should have the same amount of hang when wound up, or the general appearance will be spoiled.

Venetian blinds that are more than 4 ft. wide should have three ladder tapes fitted, the extra tape being fitted midway between the two side tapes. Extra hanging tapes will also be required, as without these additions the laths are liable to sag in the middle through insufficient support.

For circular-headed and Gothic-headed windows, a dummy blind is made to hang to the

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square meeting-rail where the pulley-head is fixed. These dummies are a series of graduated laths, slung on a couple of ladder-tapes, which are placed at an angle; the whole being hung from



Fig. 78.—Fancy Pediment Top for Venetian Blind.

a couple of screw eyes. Fig. 76 shows a dummy blind as fitted to a circular-headed window.

In estimating for Venetian blinds, it is usual to charge for all blinds containing less than 16 sq. ft. as 16 sq. ft.; for a blind only 2 ft. wide would require the same amount of tape, cord, and fittings as one 4 ft. wide; the only difference being the length of the laths.

Short Venetian blinds have no winding or turning arrangements fitted; the latter can be done by means of the ladder-tapes. The laths are hung on a turned roller. These can be purchased ready-made from wood-turners, or made to order. Fig. 77 shows one of these fitted up, with the dimensions marked for a 3-ft. 6-in. blind. The flanged portions where the turning tapes pass over should be at equal distance from each end.

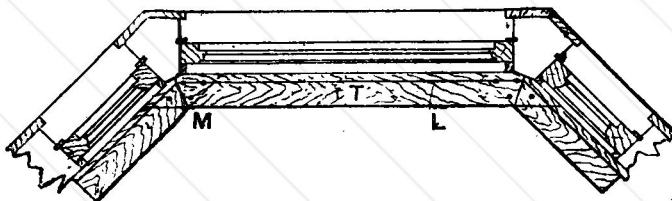


Fig. 79.—Plan of Bay Window, showing Template for Blind.

The laths do not require slotting as for long blinds. These blinds are sometimes made from birch and other hard woods, and finished by French-polishing.

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Fig. 78 shows a pediment head for a short Venetian blind, in which case a pair of rollers will be needed for turning. These are let in mortises the same as in a long Venetian; the pediment being dowelled into the top of the pulley-head. These blinds are hung on brass blind hooks, the roller or pulley-head being set parallel with the sash bars.

For blinds fitted to bay windows, the ends of the laths must be bevelled to the same angles as the casings. This must be noted when measuring for the blinds. The same allowance can be given as described for a square blind.

In making Venetian blinds for a bay window,

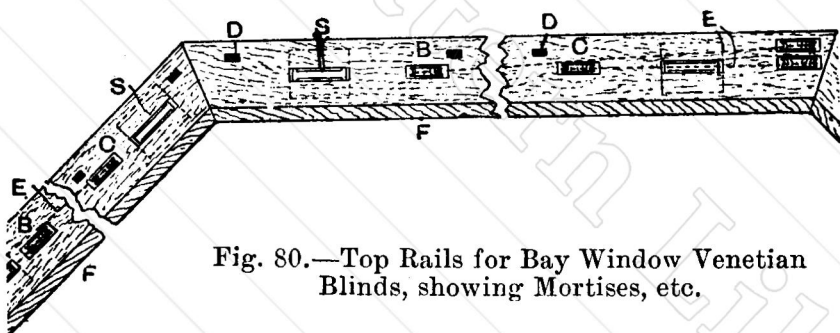


Fig. 80.—Top Rails for Bay Window Venetian Blinds, showing Mortises, etc.

the first thing to do is to make a template of the interior of the bay window. This template will be made of strips of 3-in. by $\frac{1}{2}$ -in. rough stuff, and must be constructed on the ground. After getting the splay of the side lights with the bevel, the wood should be marked, and cut off with a tenon saw, and put together with short screws. When finished, the template will be similar to Fig. 79, and must fit all round against the inside casings of the sash frame. Its use is to give the correct length and mitres for the top rails.

A pencil line (see Fig. 79), $\frac{1}{2}$ in. distant from the back edge of the template, will mark the clearance between the blinds when fixed and the window casings, and will form the basis from

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which to take the net lengths for the top rails, etc. Also the mitres should be marked across.

Now cut one piece 3 ft. long and two pieces 1 ft. 3 in. long, of 2 in. by 1 in. ; also two pieces 2 ft. 10 in. long and four pieces 1 ft. 2 in. long, of 2 in. by $\frac{1}{2}$ in. These must be from the best well-seasoned stuff. The 2 in. by 1 in. is for top rails, and will be a little longer than the clearance lines, to allow for mitring ; the 2 in. by $\frac{1}{2}$ in. is for sling and bottom rails. Plane all these up, and then, laying the top rails one at a time on the template, each with its back edge touching the clearance line, mark the correct lengths and mitres therefrom, but do not cut them off.

Set out the top rails as shown in Fig. 80, and mortise them, but note that the sling mortises must be bevelled considerably on the underneath side, to allow the tapes to have full play. These mortises are indicated by dotted lines, but Fig. 81 will illustrate the matter more fully, A representing the boxwood roller, threaded loosely on to a bit of stout iron wire. This wire is driven in at one end of the mortise, and punched in at the other after removing a bit of the fibre with a bradawl. Over these rollers are slung the tapes. Into the other mortises small grooved boxwood wheels are inserted, as shown at B in Fig. 82. They also revolve on iron wires, A, driven nearly through the rails from the back edge. Over these wheels the blind cords run, and are kept in place by small wire staples, c ; but it must be noted that these wheels, rollers, and wires are not put in until the blinds are painted and varnished, and ready for putting together.

Cut and plane up three pieces of $1\frac{1}{2}$ in. by $\frac{1}{2}$ in. to the same lengths as the three top rails. These are for fascias. Round one edge, nail them on the front edges of the top rails, and smooth all up. Sprig two or three blocking pieces (Figs. 80 and 81) on the top side of the rails the height of

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the fascias. These keep them level, and also keep the cords free from the soffit of the bay when the blinds are screwed up. Cut off the top rails to the lengths and mitres marked, cutting through the fascias to the same rake.

A pattern lath for each blind may be prepared in the following manner:—Lay each top rail on one of the lengths of lath, and prick through the

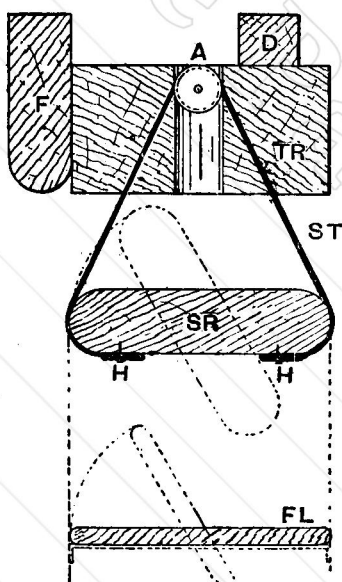


Fig. 81.

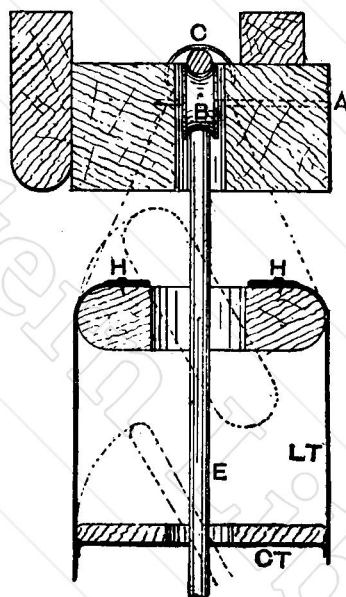


Fig. 82.

Figs. 81 and 82.—Sections of Venetian Blinds, showing Cords, Ladder Tapes, and Sling Tape.

cord mortises (B and C, Fig. 80) exactly where the cord passes through; mark the lengths and mitres, then remove the rails, and, with a very sharp gouge, cut a hole with two sharp strokes through the laths round each puncture. Of course, this will not make so good a job as when done by the proper punch used by blind-makers, but the makeshift is tolerable. Cut the ends to the same angles as the top rails; but these laths will be slightly shorter than the latter, in order

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to allow free passage to the drawing-up cords, and also to let the blinds clear each other when drawn either up or down.

The edges of the sling rails, as shown in Fig. 81, should be rounded with a bead plane. Mortise narrow slits through for the cords to correspond with the pattern laths, bevel the bottom sides of bottom rails, bore two holes through each for cords, and cut these to the same lengths and bevels as the pattern laths.

If the laths are home-made and have been spread out to dry a week or two in advance, they will now need to be planed (see Fig. 83). A repre-

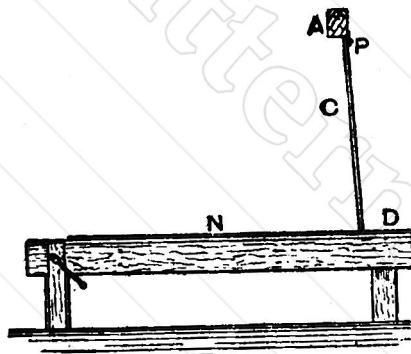


Fig. 83.—Securing and Planing Laths for Venetian Blinds.

sents one of the tie beams of roof trusses, C is a 2 in. by 1 in. prop, hinged to it with leather. The lath is laid on the bench and held in place with the prop. Only smoothing planes are used, one to rough and one to finish; the short end, D, is planed first, then pushed along the bench, and the prop readjusted so that the remainder can be done. Only one shaving must be taken each time the lath is traversed with the finishing plane, so it will be necessary to have that tool sharp and in good order. As the grain will run the reverse road on the other side of the lath, when ready, bend the nearest end sharply from you and snatch the other smartly towards you from under-

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neath, thus reversing the lath end for end, and so enabling you to plane the other side.

When finished, each lath should be carefully examined for shakes, by bending transversely between the fingers and thumb. When any such blemish is found, reject the lath, which would surely spoil the blind if used.

The laths can now be cut to the pattern laths several at a time, and the holes punched to correspond. Of course the number required is governed by the depth of the window; when they are set out on the tapes (in the manner to be explained presently) the exact number can be ascertained. Put as many as will go at a time into a shallow wooden trough, and plane the

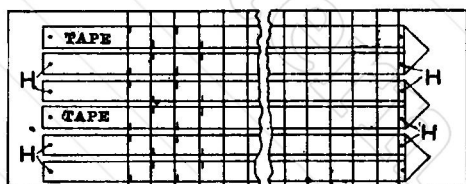


Fig. 84.—Setting out Tapes for Venetian Blind Laths.

edges; next run a bead plane along each edge to take the arris off; when the arris has been filed and glasspapered off the ends the blinds are ready for painting.

Whilst they are undergoing this process the tapes may be prepared. Get a roll of $1\frac{3}{8}$ -in. tape, of whatever colour may be preferred, and putting a tack through one end into the bench, run out a length equal to the depth of the window. Put tacks through it there, and return to the top again, laying another length parallel with the first, tack this by the side of the other, and cut off. Repeat this with all six tapes if the bench will hold them, and then with your square mark pencil lines across the lot, $1\frac{1}{2}$ in. apart, from the sling rails down to the bottom. Fig. 84 will explain this process. It will be noticed in this

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diagram that there are some alternate dark markings on several of the lines. These indicate the ladder tapes sewn on the whole depth of the blind

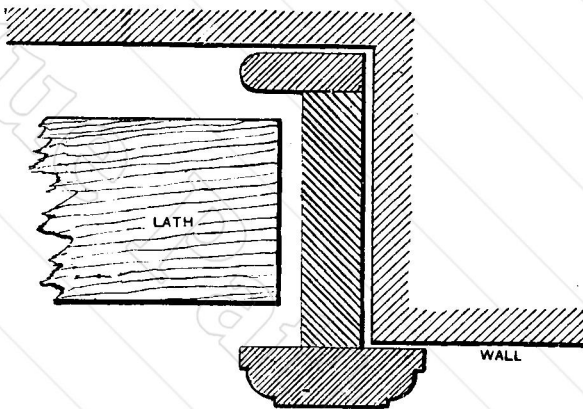


Fig. 85.—Section of Jamb of Case for Outside Venetian Blinds.

to carry the laths. These ladder-tapes are as long as the width of a lath, and $\frac{3}{8}$ in. wide.

When the blind laths have been painted, put in the wheels and rollers as shown in Figs. 81 and 82. Tack the sling and ladder tapes on to the sling rails, as also shown in those figures. Suspend the blinds from a tie beam and insert the

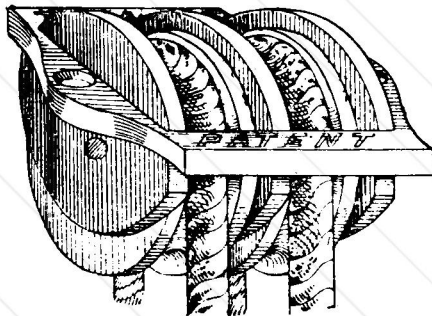


Fig. 86.—Transenna Patent Pulley for Venetian Blinds.

laths, selecting the best for the centres. Measure a piece of blind cord that will run from top to bottom along the top rails, and about two-thirds

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down the pulling-up sides ; then loop, and go up and down again and cut off. Thread this through the mortises, as shown in Fig. 80, and down the laths, securing underneath the tapes and bottom rails with a brass rosette and a knot. Pull each blind up a little, and manipulate with the pulling-up cords till the laths are parallel, and then tie a knot in these cords, thus insuring an even passage when the blinds are pulled up or down. Screw through top rails up to the soffit of the window or suspend on brackets. Screw brass

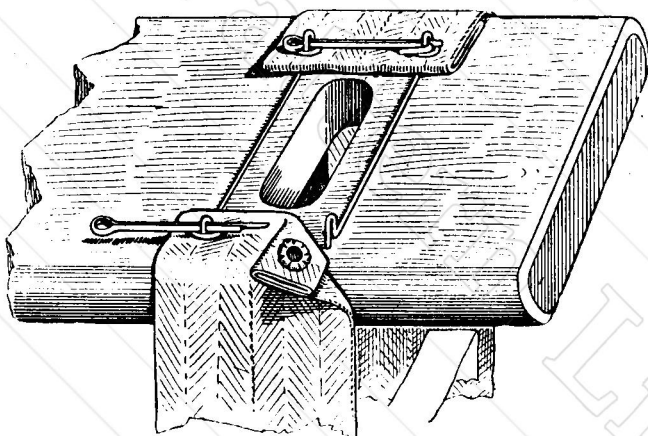


Fig. 87.—Tidmarsh's Method of Attaching Tapes to Venetian Blinds.

knobs or patent fasteners into the most convenient place on the linings to wind the pulling-up cords on ; tack a convenient length of cord round the sling rails at the opposite ends to the pulling-up cords, to enable anyone to reverse the blinds so that the laths will incline inwards or outwards ; fasten these loosely with small brass eyes into the staff beads of the sash frame, and our Venetian blinds are finished.

Outside Venetian blinds are in use, and in making them, their dimensions will chiefly depend on the position of the blinds and the depth of the reveal if the blinds are within the opening.

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Supposing the reveal is $4\frac{1}{2}$ in. or wider, the inner guard need not be more than $\frac{7}{8}$ in., and the laths may be 3 in. wide, but if the reveals are narrower the ordinary $2\frac{1}{2}$ -in. Venetian laths should be used, 2 in. apart. If possible use 3-in. laths $2\frac{1}{2}$ in. apart. The angle is variable, as the top thick lath is

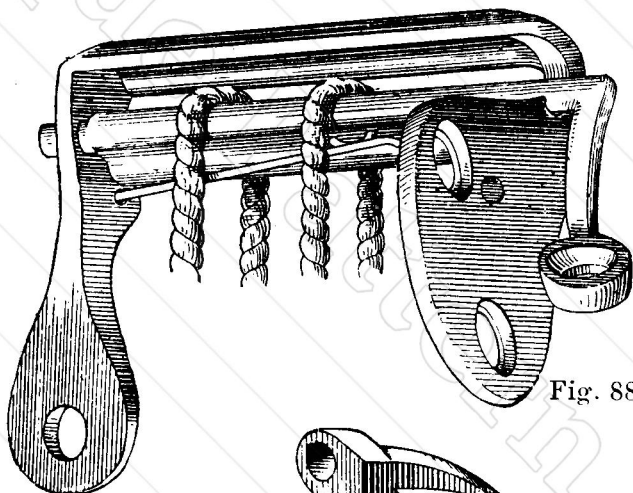


Fig. 88.

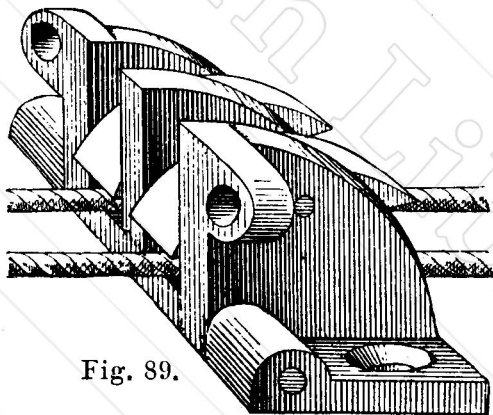


Fig. 89.

Figs. 88 and 89.—Tidmarsh's Venetian Check Actions.

hung on rollers. The blinds can be prevented from blowing about by making the cases with guards each side, as shown in Fig. 85.

Many patent fittings and attachments for Venetian blinds are available. Tidmarsh and Sons have a number of specialities in this line. There is, for instance, the Transenna patent pul-

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ley (Fig. 86) consisting of pulleys contained in a metal frame instead of being mortised into the head, with the object of securing free working of the pulleys, of preventing the line jumping off the wheels, and giving a neater appearance to the underside of the head. Then there is a method of attaching tapes to Venetian blinds, employing staples and cotter-pins (see Fig. 87), this making it possible to take off and replace the tapes to a Venetian blind without the use of any



Fig. 90.

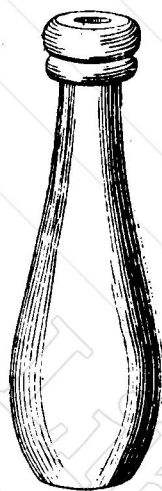


Fig. 91.

Figs. 90 and 91.—Boxwood Cord Holders.

tools whatever. Venetian blinds constructed upon this principle seem likely to supersede to a great extent those made according to the old method. Two kinds of patent check action are illustrated by Figs. 88 and 89. Most modern Venetians have check actions fitted to them. As a finish to the single lines of any kind of blind, the boxwood cord holders (Figs. 90 to 93) are very neat and useful.

Kemp's metal fittings for Venetian blinds are illustrated in Fig. 94. The metal fittings some-

what resemble a belt buckle, being in two parts, the one sliding into the other, and the pair, interlocked as shown in Fig. 94, form a firm clasp to which the tapes are attached, either by sewing or pinning, or by inserting ordinary paper fasteners. The method of attaching the tape to either section of the clasp is illustrated in Fig. 95. The hooked portion of the half-clasp shown there (and by dotted lines in Fig. 96) is matched by a corresponding hook on the other half. These hooks clutch respectively the fore-edge and back

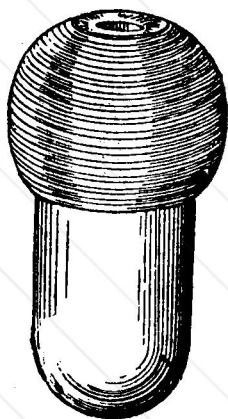


Fig. 92.

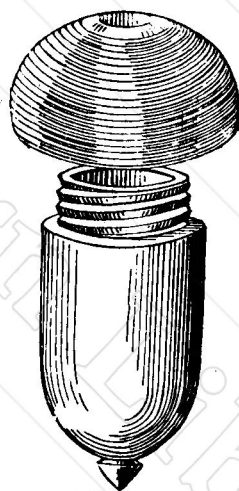


Fig. 93.

Figs. 92 and 93.—Boxwood Cord Holders.

edge of the top rail, and effectually prevent transverse shifting, while any tendency to move lengthwise is sufficiently checked by the blind-cord, which penetrates the top rail and the clasp. It will be seen that the adjustment is as simple as that of an ordinary belt clasp, and that when these fittings are adopted there is no need for tools or tacks.

The remainder of this chapter will deal with the painting and finishing of Venetian blind laths.

Before painting new blinds, prime the laths with white-lead paint tinted with the desired

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finishing colour, using as thinners 4 parts of boiled oil, 1 part of turps, and a little patent driers. When dry, rub lightly over with No. 1 glasspaper, dust, and apply one or more coats of finishing colour, made by mixing the desired colour (which is obtained ground to a stiff paste in turpentine) with 1 part of boiled oil, 1 part of japan gold-size, and 5 parts of turpentine. Paint mixed in these proportions will dry hard and sharp with an eggshell gloss, will adhere firmly

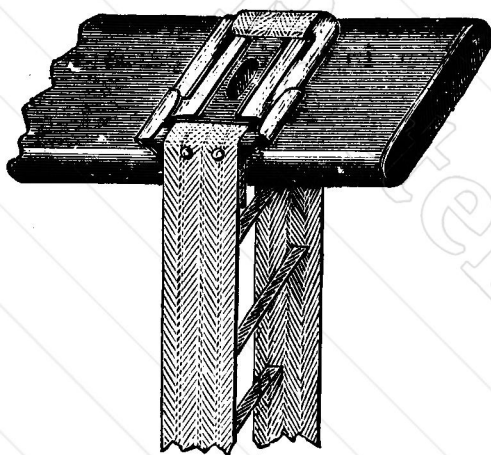


Fig. 94.

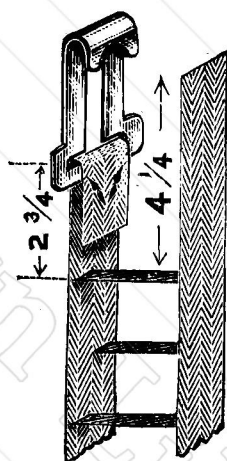


Fig. 95.

Fig. 94.—Kemp's Metal Fitting for Venetian Blinds.

Fig. 95.—Tapes secured to Kemp's Metal Fitting.

to the first coat of paint, and will not blister. The work may afterwards be varnished.

For repainting Venetian blinds, if the work is cracked, remove the old paint with a strong soda solution, rinse well, dry, prime, and finish as above. If, however, the paint is not cracked, rub down with No. 1½ glasspaper, and apply one or more coats of spirit or sharp colour, made by first obtaining the colour ground stiff in turpentine, adding a little japan gold-size to fasten it; finish with a coat of hard church oak varnish. For cheap and rapid work some decorators use

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a quick-drying spirit varnish over one coat of spirit or sharp colour.

A special combined paint and varnish for Venetian blinds is made by most paint manufacturers, the work only requiring one coat, which gives a hard, enamel-like surface at a very trifling cost.

For enamelling Venetian blinds green great care must be exercised in the mixing of the priming coat, which is specially prepared in order to give solidity to the work. For it, grind pure middle Brunswick green in a thick paste with

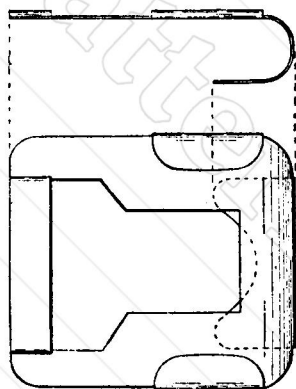


Fig. 96.—Plan and Side Elevation of Lower Part of Clip for Kemp's Fittings.

turpentine and thin down to a proper consistency with 6 parts of turpentine to 1 part of gold-size, which causes the green to dry with a dull surface. Give the blinds one coat, and, when thoroughly dry, flat down with No. 0 glasspaper, making the surface as smooth as possible, as the enamel shows up all inequalities. The enamel is prepared as follows: Pure middle Brunswick green (dry), 14 lb., church oak varnish, $\frac{1}{2}$ gal.; outside copal varnish, $\frac{1}{2}$ gal.; japan gold-size, $\frac{1}{2}$ pt.; American turpentine, $\frac{1}{2}$ pt. The green should be mixed with the copal varnish into a thick paste and ground very fine; usually the paste is ground twice

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through small cone mills. Test for fineness by rubbing to a very thin layer on a piece of glass, when the grit may be easily observed. After grinding fine, add the oak varnish and the gold-size and thin down with the turpentine. One coat of this enamel, which possesses a good body and dries hard with an excellent gloss in about twelve hours, will be found sufficient.

The easiest and cheapest method of colouring blind laths is to dissolve 1 lb. of powdered glue size in a quart of boiling water, then add a small quantity of dry yellow ochre and a little dry vandyke brown; for a red brown, add a very small quantity of dry burnt sienna. By adding these colours in variable proportions to the size, almost any shades of brown may be prepared. Before applying the size, rub the laths down with No. 0 glasspaper and remove all dust; then give them two thin coats of the size and allow it to dry thoroughly, after which a coat of varnish composed of japan gold-size, $\frac{1}{4}$ pt., church oak varnish, 1 pt., and outside copal varnish, 1 pt., should be given. Mix well before applying. The addition of gold-size increases the drying properties of the varnish and prevents the laths sticking. The above proportion of gold-size must not be exceeded, otherwise the varnish is liable to crack. This varnish dries thoroughly hard with a brilliant surface in about twelve hours, and will not crack or blister when exposed to the sun's rays.

For a light buff enamel for Venetian blinds mix together 8 lb. of pure zinc white ground in boiled oil, 1 oz. of Oxford ochre paint, and $\frac{1}{2}$ oz. of middle chrome paint; then add $\frac{3}{4}$ gal. of hard church oak varnish and $\frac{1}{2}$ pt. of japan gold-size. After thoroughly mixing, add $\frac{1}{2}$ pt. of American turpentine slightly warmed, when the enamel will be ready for use. A better result may be obtained by having the zinc white ground in varnish; this makes the enamel dry sharp and absolutely hard.

E

CHAPTER IV.

DWARF VENETIAN BLINDS.

A DWARF Venetian blind is composed of vertical laths $\frac{7}{8}$ in. wide and $\frac{3}{16}$ in. thick, fitted in a

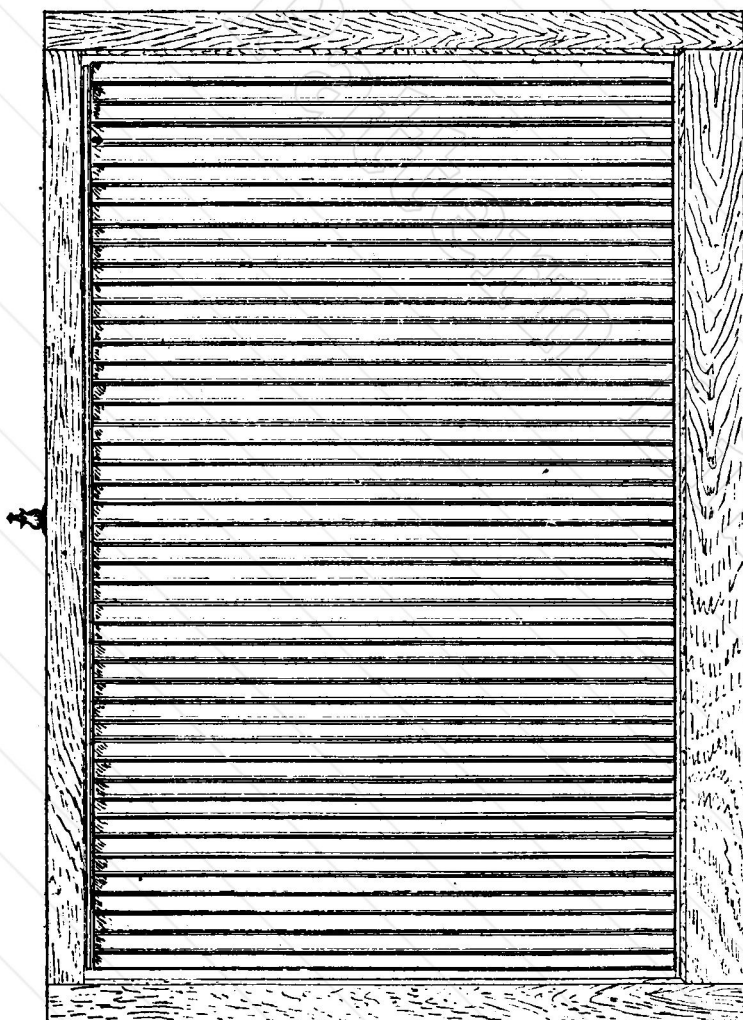


Fig. 97.—Elevation of Dwarf Venetian Blind.

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frame, which is usually made of mahogany, and is most frequently fixed between the beads of a sash frame (Fig. 97). These blinds are not so suitable for a casement as for hung sashes.



Fig. 98.



Fig. 99.

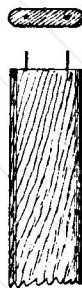


Fig. 100.

Figs. 98 to 100.—Laths for Dwarf Venetian Blinds, showing Pins Inserted.

The laths are each fitted with a wire pin at the lower end, and with two such pins at the upper end. The frame is furnished with a row of holes spaced equally along a central line on the top edge of the bottom rail, and the two wire pins of



Fig. 101.



Fig. 102.



Fig. 103.

Fig. 101.—Beads of Moving Laths for Dwarf Venetian Blinds. Fig. 102.—Disc of Action. Fig. 103.—Knob and Disc.

the upper end of the laths are made to fit easily into holes in two strips of wood spaced with holes like the bottom rail (Figs. 98 to 100). These strips (Fig. 101) are actuated by means of a disc

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of brass moving easily in a centre-bit hole bored in the under side of the top rail. In the disc are



Fig. 105.

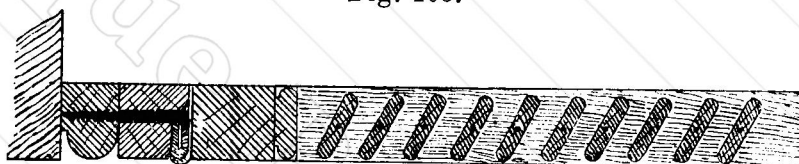


Fig. 104.

Fig. 104.—Plan of Hinged Frame. Fig. 105.—Meeting of Pair of Frames.

fixed two pieces of wire (Figs. 102 and 103); these are fitted to the strips in the same way as those of the laths, but to the brass disc is fixed, by rivet-

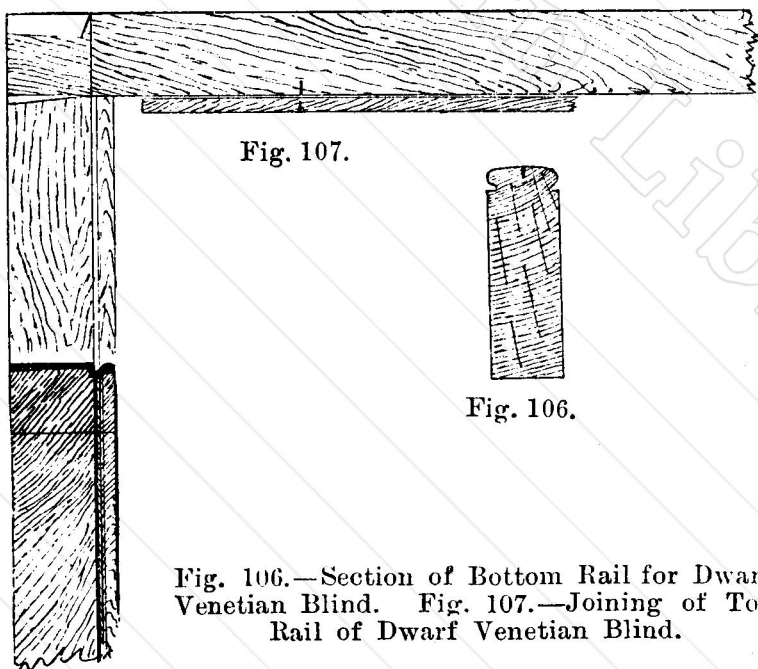


Fig. 106.—Section of Bottom Rail for Dwarf Venetian Blind. Fig. 107.—Joining of Top Rail of Dwarf Venetian Blind.

ing, a knob (Fig. 103) inserted into the top rail, so that the knob or acorn forms a central orna-

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ment to the top rail, and the disc, with its wires, moves the strips, and with them all the laths. The action knobs or acorns are usually made with a stem, which must be filed to fit the square hole in the disc, and cut according to the size of the top rail.

The method of construction thus briefly outlined is obviously inapplicable to large sizes. Extension is obtained by constructing the blind in two parts, which may be hinged on two hanging stiles screwed to the $\frac{5}{8}$ -in. sash beads (Figs. 104 and 105).

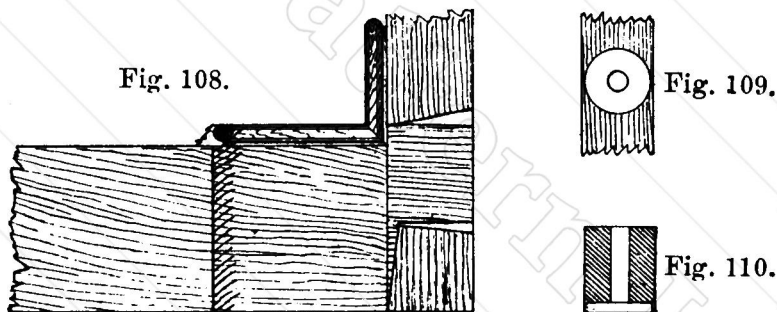


Fig. 108.—Joining of Bottom Rail of Dwarf Venetian Blind.
Figs. 109 and 110.—Top Rail of Dwarf Venetian Blind cut to Admit Disc.

The frames for these blinds are made of 1-in. oak or mahogany, $1\frac{1}{4}$ in. wide for the top rail and stiles, and about $2\frac{1}{2}$ in. for the bottom rail. The stuff is planed true, and gauged to uniform thickness. A bead, $\frac{3}{16}$ in. or $\frac{1}{4}$ in., is stuck on the inner edges of the stiles and bottom rails. The joints are at the quirk of the bead, and this must be allowed for in marking the shoulders of the top and bottom rails. The top rail needs no bead, as the moving strips answer the purpose. Fig. 97 shows a complete blind in one piece, while Figs. 104 and 105 show plans of a hinged blind in halves. The mortises may be made central to the thickness of the wood; but the laths will be helped to turn easily if the bottom rail is

planed as in the section shown in Fig. 106. Figs. 107 to 109 are self-explanatory; Fig. 110 represents a section of Fig. 109, and shows the hole for the stem of the action knob.

It must be remembered that the division of the inside of the frames for the laths cannot always be uniform, but is from $\frac{1}{2}$ in. to $\frac{5}{8}$ in.; and sometimes an even and sometimes an odd number of laths is employed. When the number is odd, the middle lath has no pins driven into it, but the wires of the action disc pass not only through the movable beads, but into the end of the middle lath, as shown in the illustrations. Two of the laths, one near each end of the blind, require three wires each, as it is on these two laths that the stability of the whole depends. In order to allow the beads to work, a small part is cut out with a gouge to give room for the centre pin (see Fig. 101). It is very important that the division of bottom rail and beads should be accurate; and it is almost as important that the pins at the top of each lath should be at uniform distances. In order to secure this result, a couple of steel wires should be driven into a piece of hardwood to form a gauge by which to determine the position of the wires for every lath. It is also advisable to make the width of the laths somewhat less than the thickness of the frame; otherwise, in turning, the laths will come in contact with some part of the sash to which the frame is affixed.

The laths can be got out of 1-in. stuff, if a small circular saw is available; the ends can be shot in bulk, and a gauge stroke run for the position of the single pin at the bottom. The painting of the laths is best accomplished with thin colour mixed with nearly all turps.

When the frames and laths are made, the polishing should be done before the actions are fixed. These having been fitted as shown in the

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illustrations, a few taps with a hammer will suffice to rivet the knobs to the forks. The laths are sprung in the frames, special care being taken with the three-wired laths (Fig. 99). A good method is to fix the frame stile in the bench screw with the action to the head of the bench, and spring in each lath horizontally, trying the action after placing each lath in position. One lath a little tight will spoil the action; so that if the top and bottom rails are not equidistant, and the laths are not all perfectly alike in length, trouble may be anticipated.

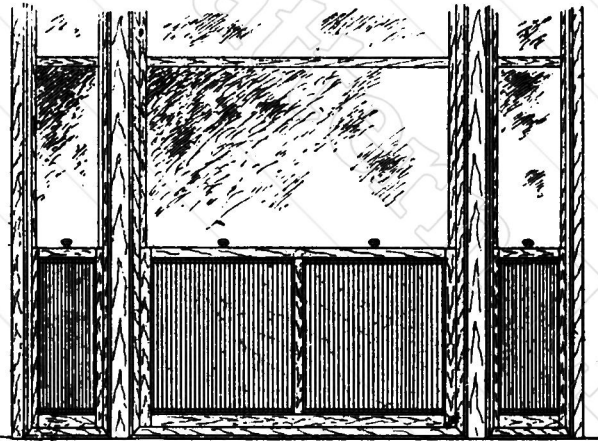


Fig. 111.—Inside Elevation of Dwarf Venetian Blind.

Dwarf blinds fitted to a bay window are illustrated by Fig. 11. Assume that they measure, when finished, 2 ft. 6 in. long by 1 ft. 5 in. high for the centre one, and 10 in. wide by 1 ft. 5 in. high for the side lights.

Cut the following from sound, well-seasoned bay-wood mahogany:—6 pieces, 1 ft. 7 in. by $1\frac{1}{8}$ in. by 1 in., for stiles; 1 piece, 2 ft. 7 in. by $1\frac{1}{8}$ in. by 1 in., for top rail; 1 piece, 2 ft. 7 in. by $1\frac{3}{8}$ in. by 1 in., for bottom rail; 2 pieces, 11 in. by $1\frac{1}{8}$ in. by 1 in., for top rail; 2 pieces, 11 in. by $1\frac{3}{8}$ in. by 1 in., for bottom rail; 1 piece, 1 ft. $3\frac{1}{2}$ in.

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by $1\frac{1}{2}$ in. by 1 in., for muntin. (In each case the thickness should be fully 1 in.)

Plane these up true and square to 1 in. and $1\frac{1}{4}$ in. wide respectively, and as thick as they will hold. Set them out as shown in Fig. 112, taking care to have the stiles by pairs and reducing the length of mortises by the width of the haunchings and beads, as shown by the dotted lines A, A. Set the mortise gauge to one-third the thickness of stuff, and gauge both mortises and tenons, mor-

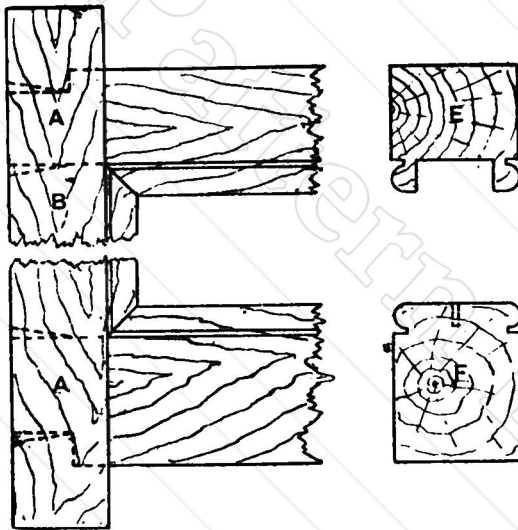


Fig. 112.—Parts of Dwarf Blinds Set Out.

tising the former just inside and sawing the latter just outside the gauge lines. The mortises should be cleaned out, but the tenon cheeks should not be cut off.

Set a mortise gauge to barely $\frac{5}{8}$ in., and gauge the width of the trench shown in the section of the top rail, E (Fig. 112). Plough this out to a depth of $\frac{1}{4}$ in. in the tried-up edges of the three top rails. Next stick the beads on both sides of the tried-up edges, as shown. In order to do this (say a stile is being operated upon), fasten one end against the bench stop and the other with a

bench knife. This bench knife is simply a bit of knife-blade about an inch long. The sharpened edge is driven partly into the stuff and partly into the bench, sufficiently deep to hold the timber and at the same time be clear of the plane. The tried-up edge and face being towards the operator, he, with the jack-plane, will just lightly take off the corner arris; then, with a $\frac{1}{4}$ -in. bead-plane pressed firmly against the edge with the left hand and held perfectly upright with the right, he will begin sticking his bead at the end farthest from him,

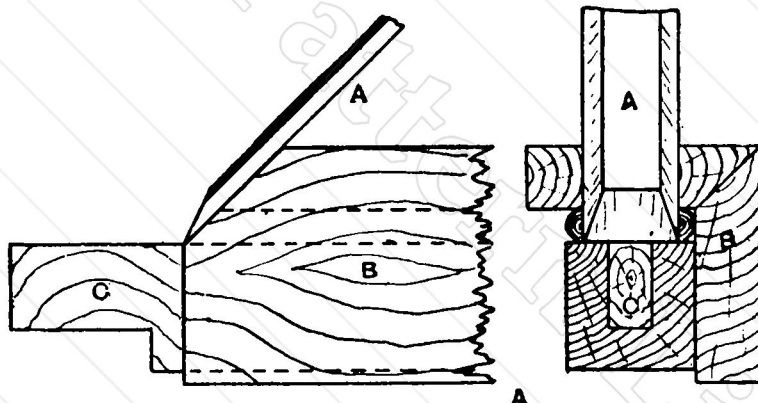


Fig. 113.

Fig. 114.

Figs. 113 and 114.—Method of Cutting Mitres for Dwarf Blinds.

working his way backwards until he finishes at the other end. If the plane is held as described, first the quirk and then the bead will develop themselves, and when the required form is obtained the plane will cease cutting. Reversing the stile end for end, the operation is then repeated on the other side of the same edge. When the beads are all stuck and sandpapered, the tenon cheeks may be cut off, the tenons cut as shown at A, A (Fig. 112)—utilising the waste haunching for wedges—and the mitres cut. This is done with a mitre template and chisel (see Figs. 113 and 114). The template is fitted on the beaded

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edge as shown, and held firmly with the left hand, while the right hand, grasping the chisel handle, is assisted by the chest in paring the mitre to the same angle (viz. 45°) as that of the template. The mitres must not be cut the least bit more or

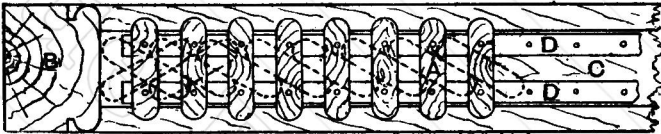


Fig. 115.—Part Plan of Top Rail and Stile for Dwarf Blinds, showing Method of Adjusting Slides and Laths.

less than as indicated in Fig. 112, or they will not come up when the frame is put together. Care must also be exercised not to cut the template. The portions of the beads on the stiles beyond the mitres must be cut off down to the bottom of the quirk and the stuff pared perfectly square, as they have to form the shoulders for the rails (see A, A, Fig. 112). The way to deal with the muntin is sufficiently indicated in the sketch elevation (Fig. 111), but the tenons of this do not go

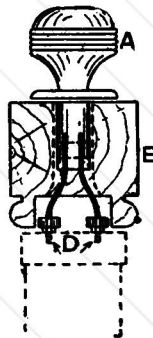


Fig. 116.—Method of Working Slides of Dwarf Blinds.

through the rails—they are simply stumped in—and it is beaded and mitred on both edges.

Two strips of steel must now be provided, as shown at D, D (Fig. 115). These are perforated with holes $\frac{3}{8}$ in. apart, and each of the bottom

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rails must be set out to exactly correspond with these strips, a row of holes being bored down the centres with a bradawl (section F, Fig. 112). Set out, and bore with a brace and bit, the four holes through the top rails for the shanks of the turning handle E (Fig. 116), and widen out at bottom as shown. The handle and its use are sufficiently illustrated at A and D (Fig. 116). As will be at



Fig. 117.—Section of Dwarf Blinds, showing Metal Ferrules, Steel Slides, etc.

once seen, it is by means of this handle the blinds are opened and shut either to right or left, as indicated by dotted laths in plan (Fig. 115).

The frames can now be put together and wedged up, tested for being square with the rod, and examined to ascertain that all the mitres are up before the wedges are finally driven home. Clean off and shoot the edges. In the bottom edges drive a couple of iron-wire dowels about 6 in. from either end. Corresponding holes are

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bored in the staff beads of the sash frames, when the blinds are fixed, for them to drop into, small brass flush bolts are let in at either top corner, and eyes let into the staff beads for them to shoot into. These, combined with the dowels, make the blinds secure.

While the frames are being French-polished, the laths can be got ready. These are $\frac{3}{4}$ in. wide, $\frac{3}{16}$ in. thick, and rounded on both edges. A (Fig. 117) shows one in elevation, and A (Fig. 115) shows several in plan.

Figs. 115 and 117 fully illustrate all subsequent proceedings. After the laths are cut to the depth and painted green, metal ferrules B (Fig. 117) may be slipped on. These ferrules are of pliable yellow metal. The steel-wire pins having been driven in—two at the top and one at the bottom (indicated by B, Fig. 117)—the laths are ready for the frame. When the frames are polished, put them upside down, lay the slides in the troughs, and insert the laths one at a time, first in the hole in the bottom rail, then in the two holes in the slides. When they are all inserted push the knob shanks through, and when the tongues are secured to the slides with the little tapped washers, our dwarf-blinds are complete and ready to fix.

The lettering in Figs. 112 to 117 is explained as follows:—Fig. 112: A, A, Tenons, wedges, and haunchings; B, stile; C, top rail; D, bottom rail; E, F, section of top and bottom rails. Figs. 113 and 114: A, firmer chisel; B, mitre template; C, tenon and haunching of bottom rail. Fig. 115: A, vertical laths; B, stile; C, top rail; D, D, steel slides. Fig. 116: A, brass knob, with metal tongues rivetted in shank; D, threaded ends of tongues fastened through slide with tapped washers; E, top rail. Fig. 117: A, lath; B, B, metal ferrules; B, steel sides and pins; E, top rail; F, bottom rail.

CHAPTER V.

VENETIAN SHUTTERS.

VENETIAN shutters form an effective sun-blind, besides adding a welcome variety of colour to some buildings. They are of two kinds—hinged and sliding. Both are usually made in two equal parts meeting in a vertical joint in the middle of the window opening. If this is wide the hinged shutter cannot be recommended, while on

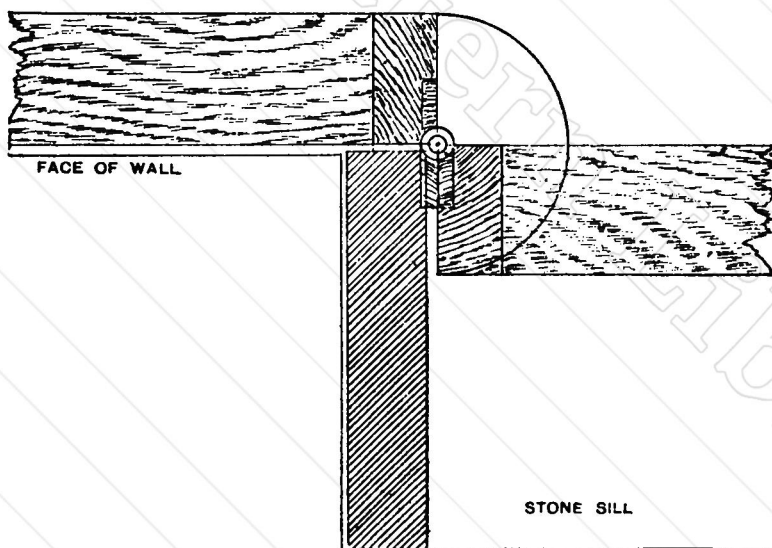


Fig. 118 —Venetian Shutter on Wood Lining on Reveal.

a balcony or where space is restricted a hinged shutter is prohibited.

When the shutters are hinged, either a wood reveal, as in Fig. 118, must be provided, or Parliament hinges (see Fig. 119) must be employed. Venetian shutters are out of place unless the face of the wall is flat, for not only would the shutters

hide any decorative treatment of the piers, but any projection would prevent them occupying a position close to the wall when not in use. Neither can Venetian shutters be used for a range of windows when the window openings are wider than the piers which separate them, unless the shutters are hinged and made in four pieces instead of two, which would add considerably to the cost. When Venetian shutters are made to

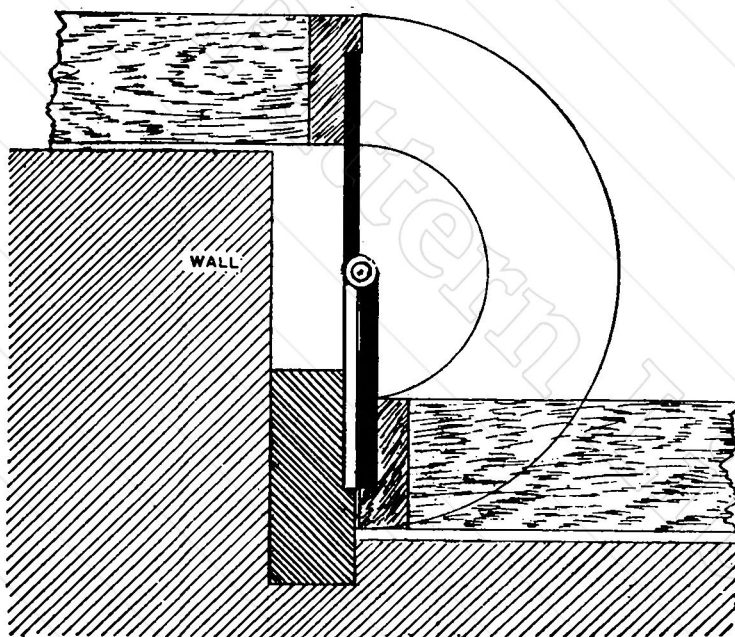


Fig. 119.—Venetian Shutter with Parliament Hinges.

slide, a sill must be provided fully twice as long as the width of the window opening. A similar rail above the window head serves as a guide to the moving shutters. The sill must be truly level, and if necessary scribed to the stone sill. It is usually fixed to corbels inserted in the brickwork, but T iron could be used for this purpose and for the sill and top rail. The bottom rail of the shutter frame is fitted with rollers to obtain easier movement.

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The stiles of the shutter frames (see Fig. 120) may be 3 in. by $1\frac{1}{2}$ in., and the bottom rails 3 in. by $4\frac{1}{2}$ in., the top rail being 3 in. square. All should be of best yellow deal. The laths should be of pine $\frac{1}{2}$ in. thick, and if fixed at 45 degrees, as shown in Figs. 118 and 119, must be $4\frac{3}{4}$ in. wide;

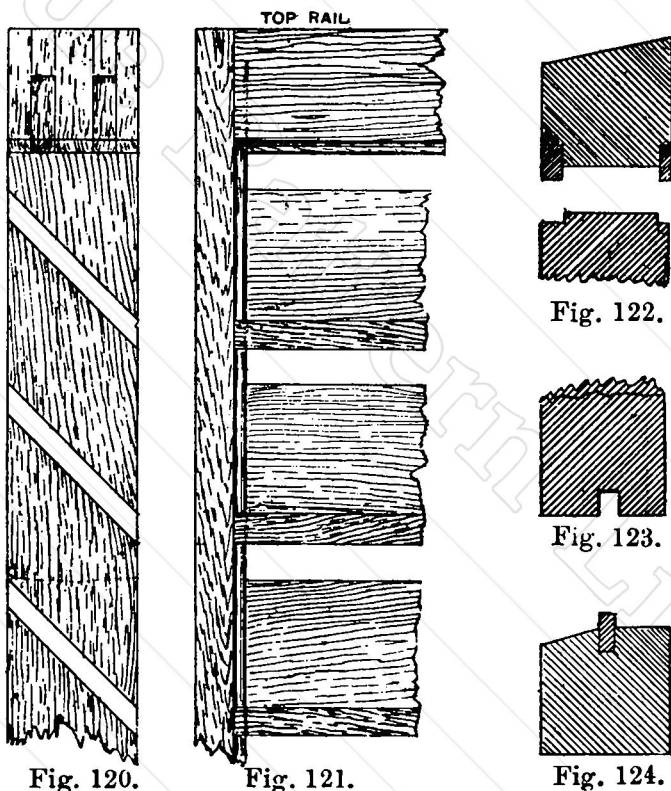


Fig. 120.—Setting Out Stile for Venetian Shutters. Fig. 121.—Part of Front Elevation of Venetian Shutters. Fig. 122.—Fitting Top Rail to Venetian Shutter. Figs. 123 and 124.—Details of Sill of Venetian Shutter.

but any suitable angle may be adopted. The laths in Figs. 120 and 121 are shown $3\frac{3}{4}$ in. apart in the clear, and for 45 degrees this distance should not be exceeded, but it will give effective shade until the sun is almost down, that is, until its rays are 30 degrees from a horizontal line. This will

suffice for a southern aspect, but for a more western front the laths should be placed somewhat closer together. If a line is drawn from the lower edge of any lath to the upper edge of the next below it, the line (across the thickness of the shutter) indicates the effective shade that any spacing gives. In Figs. 120 and 121 the distances of laths were determined by a 30 degrees set-square. The stiles should be mortised as shown in Fig. 120 for two $\frac{1}{2}$ -in. tenons, and a $\frac{3}{8}$ -in. bead should be worked on the inner edge of the stiles and top rail. The bottom rail may with advantage be shot to the angle of the laths on its upper surface, either partly or entirely, and on the bottom rail the bead should be omitted. The bead



Fig. 125.

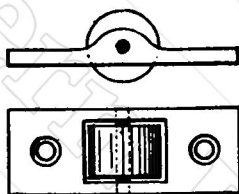


Fig. 126.

Fig. 125.—Corbel for Sill of Venetian Shutter. Fig. 126.—Roller for Venetian Shutter.

on the stiles marks the depth of the grooves in which the laths are fitted.

If the shutter is hinged rain is apt to flow down the laths, when not in use, towards the wall, which is a reason why sliding shutters are to be preferred.

It is customary to fix diagonal strips of $\frac{1}{2}$ -in. by $\frac{3}{8}$ -in. iron across the frames in order to keep the shutters square. These strips should be fixed on the inner side, being let in where they cross the laths and fixed with screws to the stiles and rails.

The conditions of hinged shutters, as far as width of projecting hinges is concerned, may be seen in Figs. 120 and 121. The rails and sills

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for sliding shutters vary according to the taste of the maker, the chief object being to avoid a lodgment for water. Fig. 122 illustrates a method of fitting the shutter to the top rail, of which a section is given, while Figs. 123 and 124 are details of the sill, Fig. 125 illustrates a corbel for the sill, Fig. 126 shows the rollers, Fig. 127 the iron plate, Fig. 128 the driving bolt, and Fig. 129 is the bracket, both the last being used for fixing the top rail and sill.

A form of shutter which offers some advantages is shown in Fig. 130. The lower half swings outward on pivots which centre the movable portion,



Fig. 127.

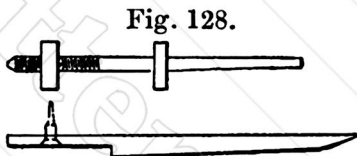


Fig. 128.

Fig. 129.

Fig. 127.—Iron Plate for Venetian Shutters. Fig. 128.—Driving Bolt for Venetian Shutters. Fig. 129.—Driving Bracket for Venetian Shutters.

and at pleasure allow it to remain vertical and in gauge with the fixed laths. To make the shutter for this purpose, prepare the stiles, as in Fig. 131, with loose pieces fitting in the reduced thickness made to admit the uprights of the movable portion. Fig. 132 illustrates the bottom rail. The centre is in the middle of the stile, or it may be a little forward rather than behind the centre of the thickness of the shutter. The arc at the top of the moving part may be a half circle or less, and must clear the fixed lath or middle rail. The work should be done so that the spacing of the laths is not interfered with. The loose pieces are let into the stiles before the frames are put together, and the setting out is done as if no moving part were intended, care being taken to avoid cutting into the housing of any of the laths. The

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setting out of the laths and grooving is done with the movable part in position. As in a Venetian

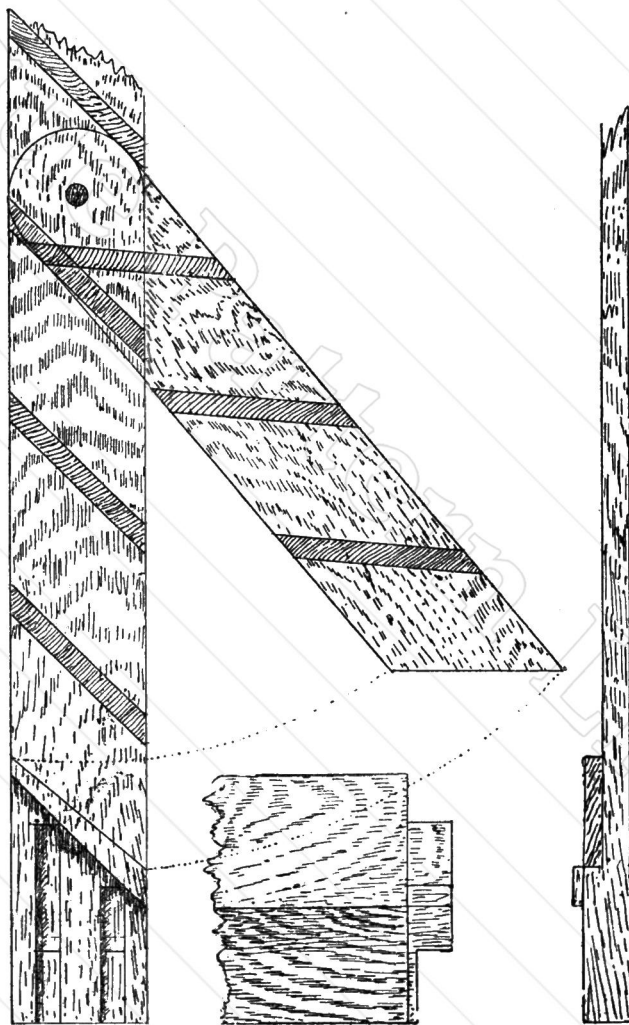


Fig. 130.

Fig. 132.

Fig. 131.

Fig. 130.—Venetian Shutter with Moving Lower Half. Fig. 131.—Stile of Venetian Shutter reduced for Moving Piece. Fig. 132.—End of Bottom Rail of Venetian Shutter.

blind, the distances of the laths should be proportioned to their width and angle, but within small limits it is determined by the height of the

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frame, as the division should be made so as to leave no remainder. The best way is to divide the height by the desired distance (this will give the number of intervals), then divide the distance between the top and bottom rails by the number determined on, less the thickness of the laths measured vertically. The number of laths is one less than the number of spaces. Suppose the whole distance is 9 ft. 7 in., and the desired interval $4\frac{1}{2}$ in.; this gives twenty-five spaces, and therefore twenty-four laths, the thickness of the twenty-

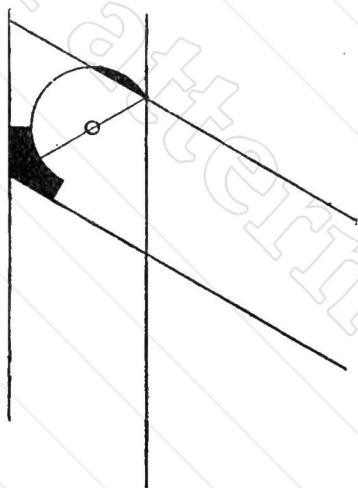


Fig. 133.—Determining Position of Pivot for Venetian Shutters.

four laths, each $\frac{5}{8}$ in. measured vertically on the stile, being 1 ft. 3 in. Then 9 ft. 7 in. - 1 ft. 3 in. = 8 ft. 4 in., and this divided by 25 will equal 4 in. clear between the laths. The distance between the laths may be less, but not more than a standard space according to the width and angle of the laths. The lower halves of the shutters made to move forward may be fitted with elbow joints or casement stays or hooks. Fig. 133 shows that the centre of movement for these shutters should be on the bisecting line of the angle at which it is intended to fix the movable part.

CHAPTER VI.

OUTSIDE SUN-BLINDS.

MANY outside sun-blinds are inexpensive, and easy to make and fix. The blind shown in Fig. 134 is frequently used in London as a screen to a painted front door. It is fastened at the top to the frame of the door by a series of hooks and tapes, but a better plan is to run a lath into a broad hem at the top of the material, and to use only two hooks on the door frame, with corresponding eyes in the lath, as shown in Fig. 135. The lath from which the apron piece, in Fig. 134, depends is wider than the doorway, and merely rests against the wall. The apron piece may be ornamented at the bottom, and is usually either scalloped and hemmed with red braid or else provided with a fringe. The cost of material for a blind put up to this design was 3s.

For the window blind shown by Fig. 136, laths and hooks are used at the top and bottom. The stick across is intended to facilitate the admission of air, but is not very effective. From time to time this stick is pressed lower down, as the material gets old and slack.

Fig. 137 shows a common type of permanent sun-blind. There is in a prepared box at the top of the window a spring roller which coils up the blind when this is not in use. The bottom of the blind is supported by a light iron rod, the two ends of which are bent inwards and fitted to the long runner irons at the sides of the window frame. This iron support also lifts, the horizontal part of it following the blind into the box, so that when the blind is out of use, no part of

OUTSIDE SUN-BLINDS.

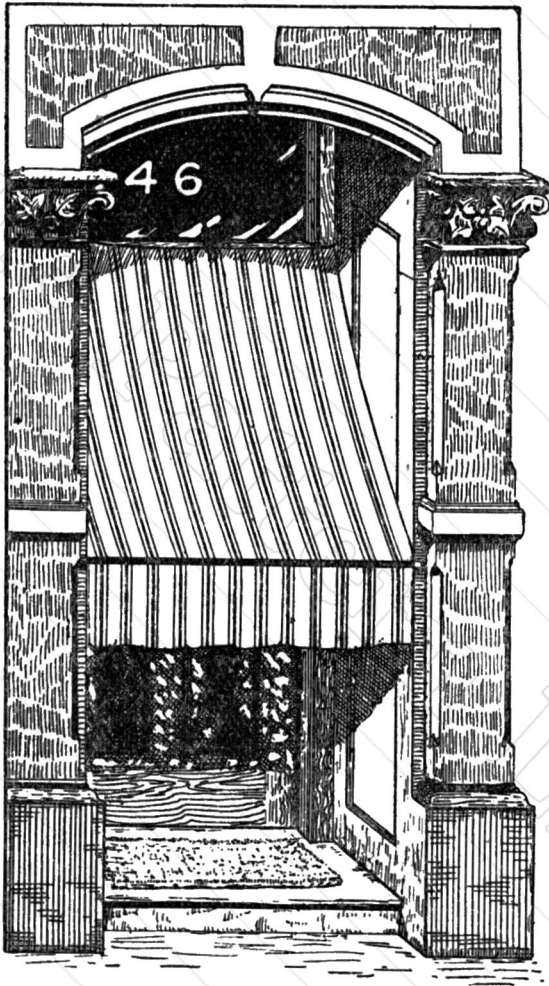


Fig. 134.—Outside Sun-blind for Front Door.

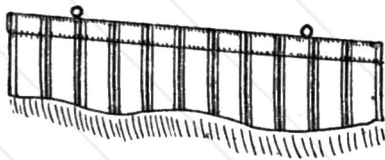


Fig. 135.—Top of Sun-blind.

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the fittings can be seen from the inside of the room. The prices usually charged for a blind of this description range from 1s. 6d. to 1s. 11d. per sq. ft., spring roller, boxing, and fixing in-

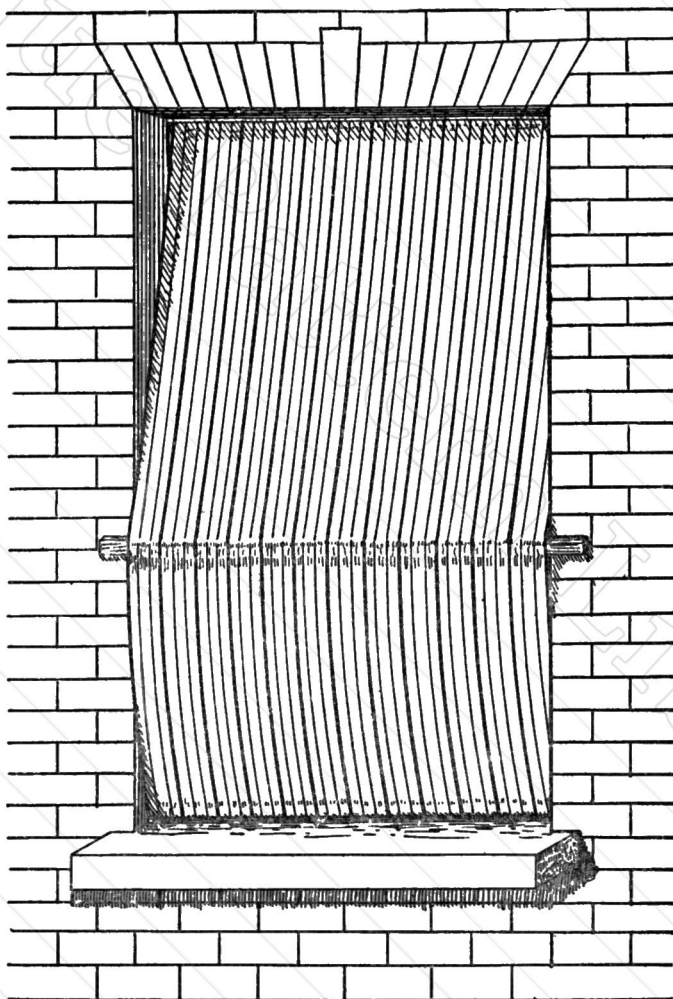


Fig. 136.—Outside Sun-blind for Window.

cluded. For a window 6 ft. 6 in. by 3 ft. 6 in., best Barnsley linen tick, costs 3s. ; bent iron support and runners, 5s. ; and boxing (or hood) and spring roller, 4s. Most contractors for this kind

OUTSIDE SUN-BLINDS.

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of work have, however, as a minimum, the charge for 18 sq. ft.

Fig. 138 shows a hanging sun-blind for a ground-floor window, and Fig. 139 is an enlarged

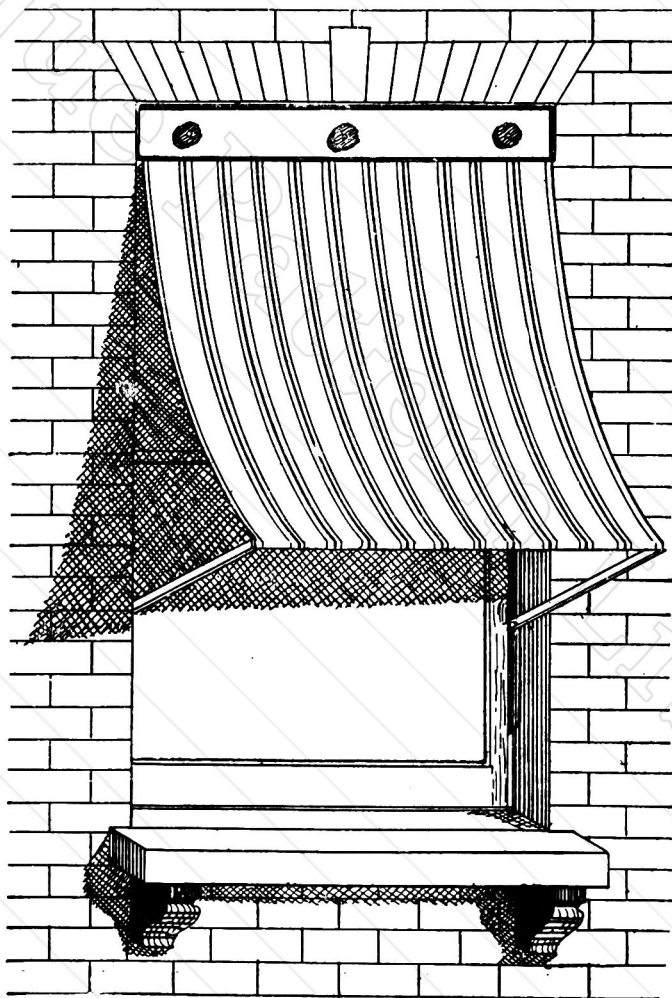


Fig. 137.—Permanent Sun-blind for Window.

section through the window, showing the hanging rail and the stretcher hooks. All the fixing necessary for this blind is the hook rail; this is made of 1-in. by 3-in. yellow deal, and is pro-

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vided with a number of brass cup hooks, and fixed with screws to three joint plugs in the wall. Eyelet holes are worked in the top edge of the blind, and a strip of hard wood, teak for preference, is sewn into a hem in the bottom edge. A pair of straight iron hooks, from 18 in. to 26 in. long,

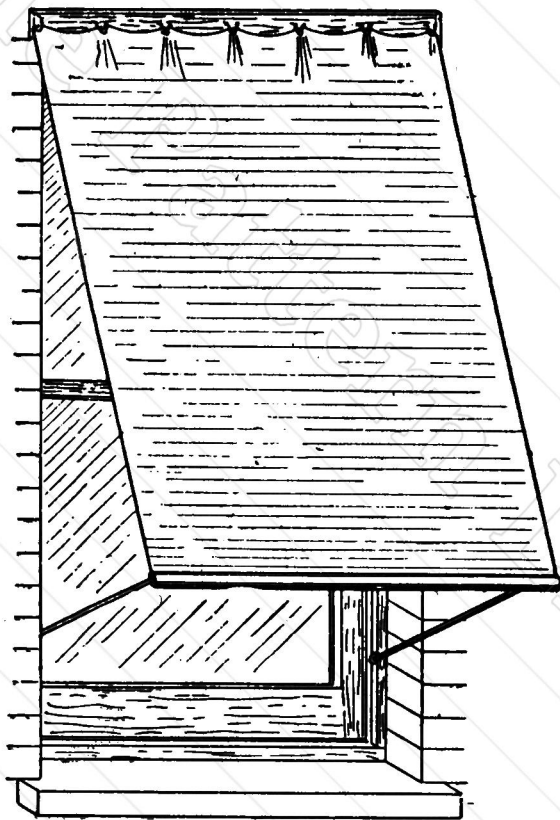


Fig. 138.—Hanging Outside Sun-blind.

are screwed somewhat tightly to the edge of the window lining, and these engage with a couple of eyes in the wood strip, as shown in Fig. 139. Oiled calico or blue-striped union is a suitable material for this blind.

Fig. 140 is the elevation of a spring roller blind and frame, Fig. 141 being an enlarged vertical

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section, and Fig. 142 a similar horizontal section of one side, with the roller in plan. This form of blind is more suitable for upper windows, and, if desired, the spring on the roller may be replaced by the ordinary rack pulley and cord. In this case a complete box about 4 in. deep is provided

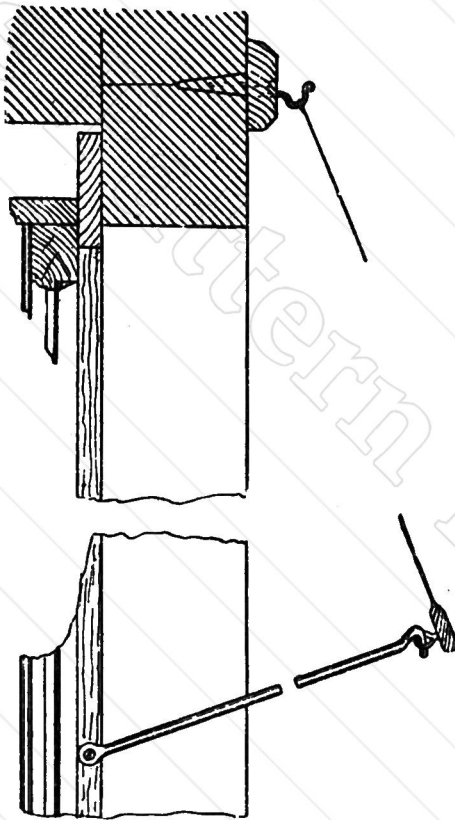


Fig. 139.—Vertical Section of Hanging Blind.

for the blind, the top and bottom being usually dovetailed into the sides, and the back and front housed into them; with care, however, they might be made sufficiently strong by cutting off square and simply nailing together; the back and front rails A and B (Fig. 141) and the bottom C should be cut off between the sides D (Fig. 142), but the

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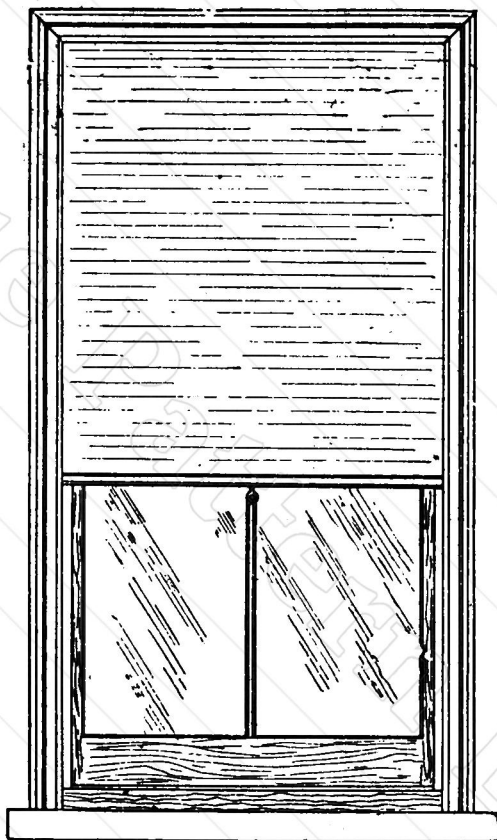


Fig. 140.—Elevation of Spring Blind and Frame.

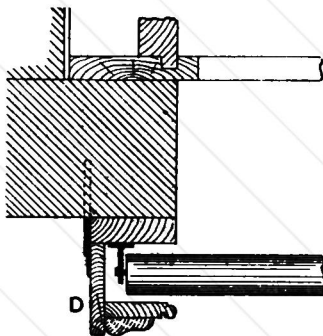


Fig. 141 —Horizontal Section of Spring Blind.

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cover board **E** (Fig. 141), which is sloped to carry off the rain, is run over the edges of the frame flush with the ends, and projects $\frac{3}{4}$ in. in front to cover the moulding. The case is fixed to the window by wall hooks, as shown in Fig. 142, and the

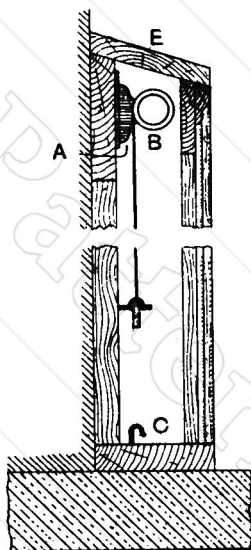


Fig. 142.—Vertical Section of Spring Blind.

bottom lath should overhang the blind on each side to engage with a series of hooks, driven at intervals into the frame back. A hook is also placed in the middle of the bottom to secure the blind when right down.

CHAPTER VII.

SPANISH BLINDS.

A SPANISH blind (Fig. 143) consists of a suitable linen cloth, or tick, fixed upon a roller, but terminating at its lower end in a hood, which is capable of being raised, or lowered, or gathered in so that the whole can be drawn up into the least possible compass. All the parts of the Spanish blind are made to contribute to this end, and to a somewhat ornamental appearance. It must at once be stated that a Spanish blind must be straight on plan.

As the Spanish is an outside blind, its use in Great Britain has been greatly increased by the modern custom of fixing the sash-frames some 5 in., or more, from the face of the wall; and by the use of sliding sashes, instead of casements opening outwards. Front and side elevations of a case for a Spanish blind are given by Figs. 144 and 145.

In measuring for outside blinds, therefore, the space outside the sash-frame has to be measured. This is called the "reveal." If the reveals are of brickwork, unplastered, care will have to be taken in measuring. The best way, after measuring the width with a rule, is to cut a piece of wood to the length, and try it at various heights. It will often be found that the rod so tried will stick fast at some place, and require to be cut shorter. As to the length, correct measurement is not quite so important, because a trifle can be cut off in fixing, although in width it is almost impossible to do so; but by all means measure with a rod or two rules. The slope of the sill

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must be taken, and the curve of the soffit, or upper surface joining the reveals. If this is much curved, the window is not suitable for a Spanish blind. A very common radius for such soffit curve

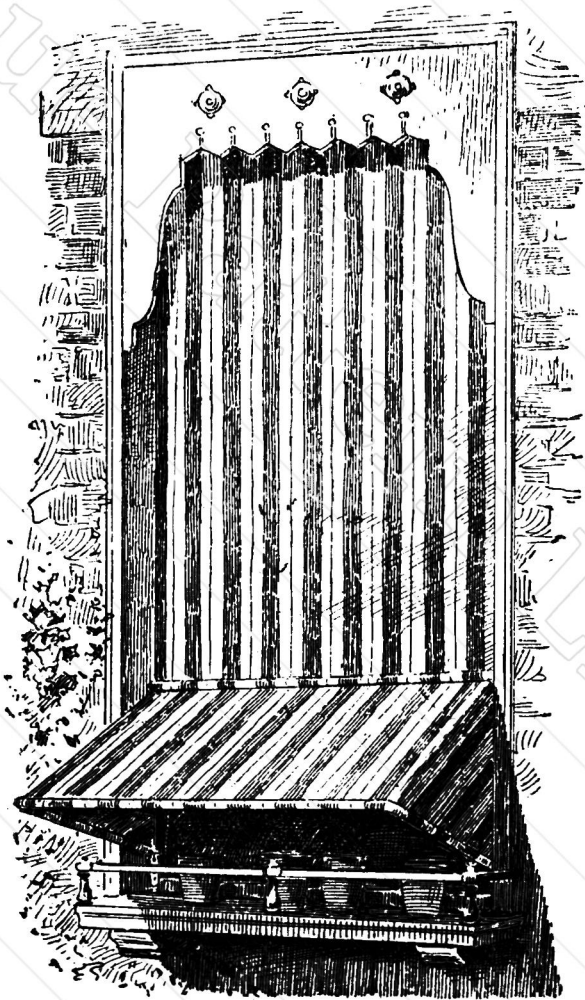


Fig. 143.—Spanish Blind.

is equal to the width (see Fig. 146, where a curve is drawn to that radius). It is, however, almost prohibitive for a Spanish blind, as it causes such a waste of space and a deeper fascia-board than

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is at all pleasant for the inmates of the house. A curve of a flatter character, as the inner curve, to a radius about twice the width, is quite as high as the blind-maker cares about. He can cut a

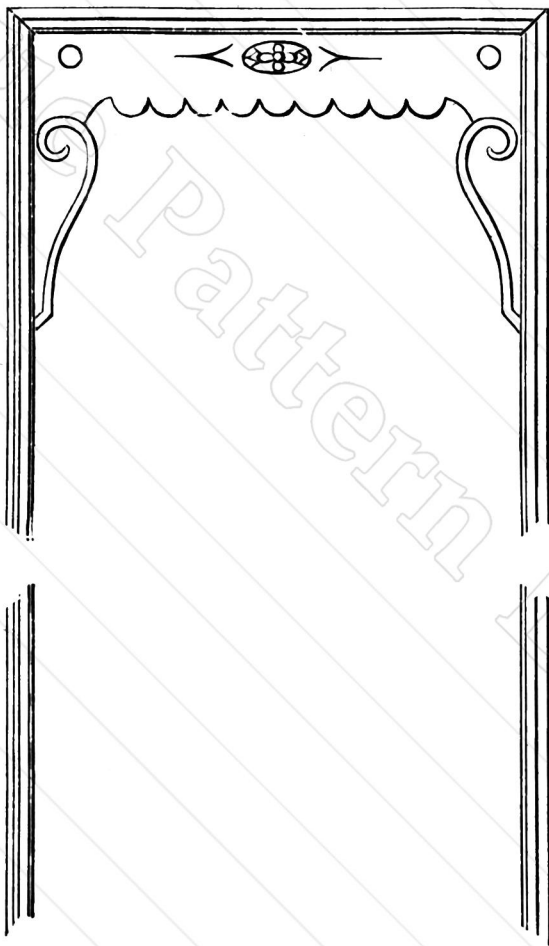


Fig. 144.—Front Elevation of Wooden Case for Spanish Blind.

little off the corners of his frame, or he can fix a false fascia above it to fill the space; but a roller must be straight, so that must determine the whole matter. The distance from sash-frame to face of wall must be taken.

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The frame may be of 1 in. or $1\frac{1}{4}$ in. deal for the top, but $\frac{3}{4}$ in. will do for the sides. All must, of course, be good and sound, and best yellow deal will be better than pine; the width accord-

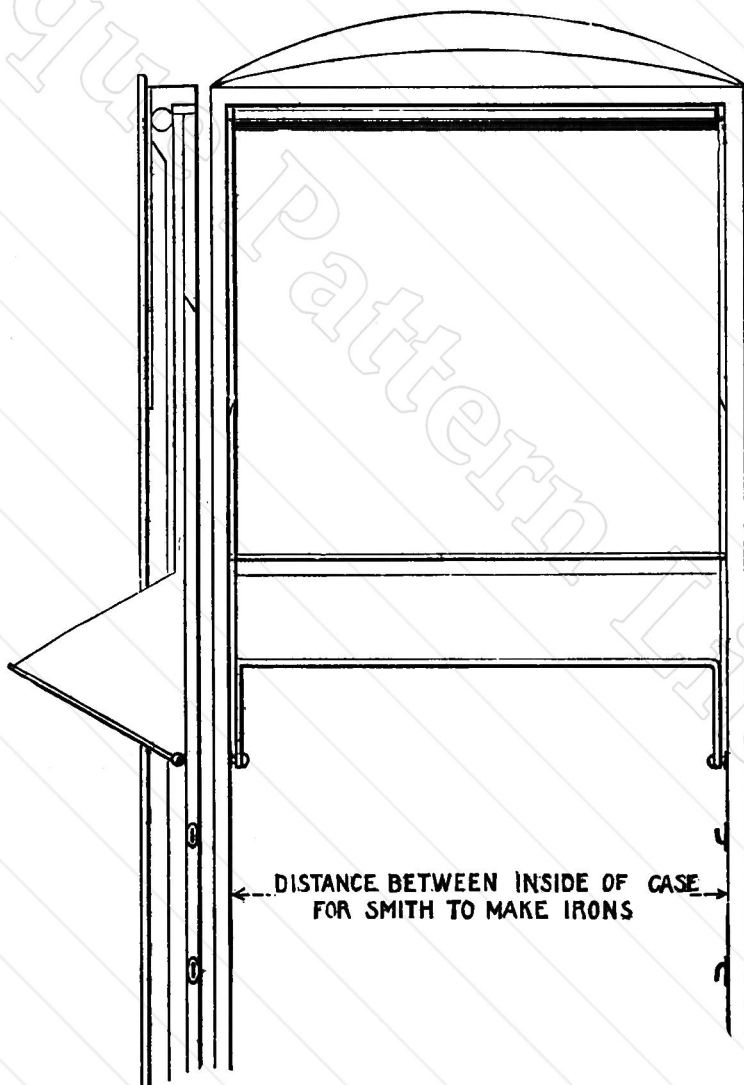


Fig. 145.

Fig. 146.

Fig. 145.—Side Elevation of Case for Spanish Blind.
Fig. 146.—Inside Elevation of Case for Spanish Blind, showing Roller and Irons.

ing to the depth of reveal. The fascia-board, or front, extends across the upper part of the case, and can be made of best pine, which must be dry and perfect; $\frac{3}{8}$ in. in thickness will be sufficient, and width enough to cover the blind when drawn up. The top rail and sides ought to be dove-tailed together; and it may save time to notice that the top rail may be narrower than the sides by just the thickness of the fascia-board just mentioned. Be careful when fixing the fascia-board that the angles are right angles, as otherwise any fault is thereby fixed and unalterable, except with great trouble (see Figs. 147 and 148).

The wings are intended to protect the tick at the sides of the blind when drawn up, and are usually cut to some ornamental shape. It is best to avoid any sharp projecting angles, however, and a simple ogee form is sufficiently decorative. The wings are fixed to and form appendages of the fascia, of the same thickness; and any decorative treatment of wings and fascia must be harmonious. There are many ways of ornamenting fronts of blinds, among which may be mentioned mouldings, fixed, forming various shaped panels, cutting the edge into semicircular or other forms, fixing pateras upon the flat surface or composition, or carved ornaments. All these can be combined, if desired, and the effect can be heightened if, in painting, a variety of colours or tints of the same colour is applied to the ornaments.

The guides are fixed to the sides, having rebates on the inner opposite angles, as may be seen in Figs. 147 and 148. The exact width or thickness is of no importance, but roughly, each guide will be about one-third of the width of upright side. The guides need not extend quite to the top, and much stopping of holes will be avoided if the screws are inserted through sides, as in Fig. 148. An exception, however, may be made, as in Fig. 147, as regards a portion of the back guide, made

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movable, which will greatly aid in supporting the pulley-rail, described later.

Fig. 147.

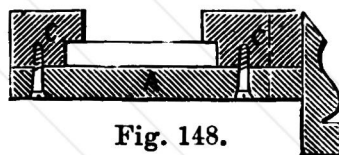
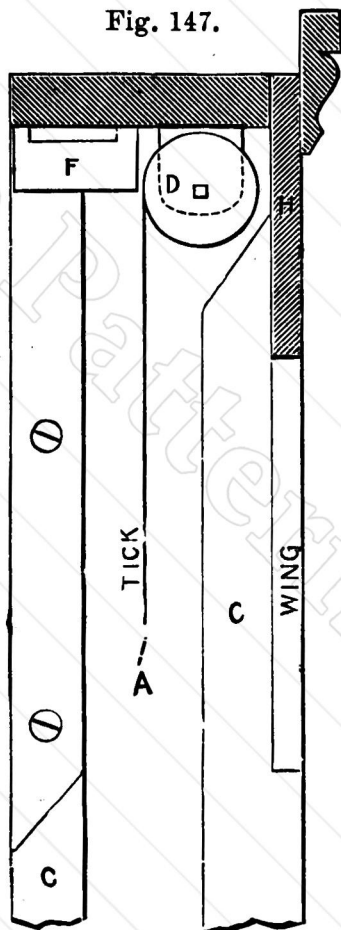


Fig. 148.

Figs. 147 and 148.—Sides of Case for Spanish Blind.

The sliding strip, on which the irons are fixed, can be made in various ways. All that is needed is something to prevent the slide coming out of

G

the groove in which it ought to move quite freely, and this is a simple and sufficient method of procedure. The two pieces of wood, *k*, are fitted and screwed to the back of the slide, *e* (Figs. 149 and 150). Mahogany will do well for this purpose.

Fig. 149.

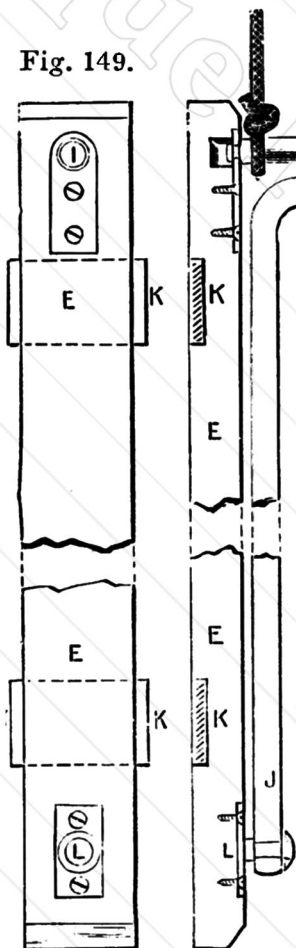
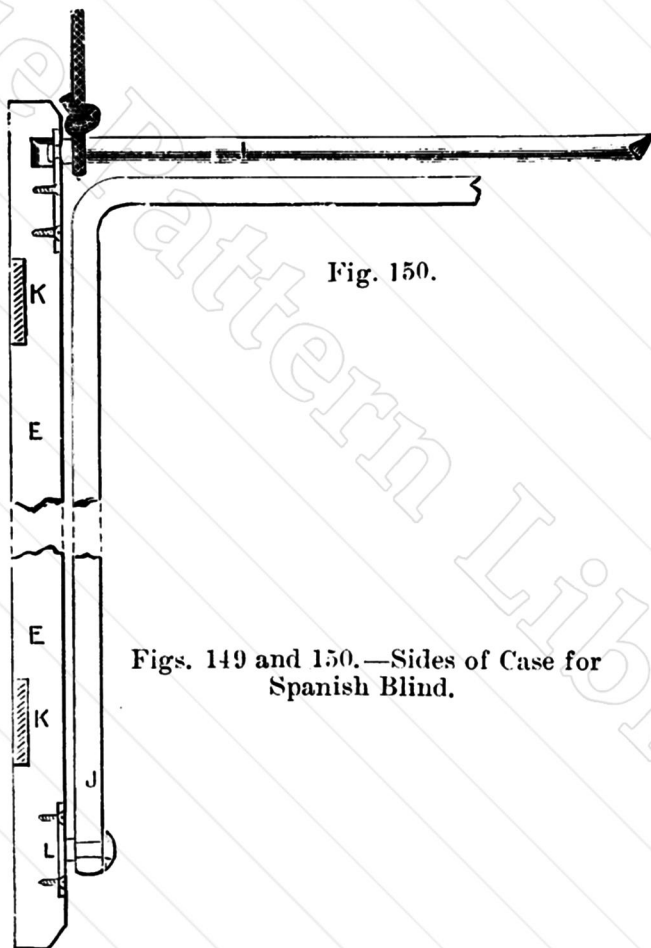


Fig. 150.



Figs. 149 and 150.—Sides of Case for Spanish Blind.

The size of these pieces, of course, depends on the distance between the rebated edges of *c*, *c* (Figs. 147 and 148).

The mouldings, which should be chosen with some regard to the prevailing character of the

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various mouldings used in the adjacent woodwork, can be fixed when the frame has been constructed, and the guides, and the fascia, and wings fixed. If the top is curved, the moulding ought to be

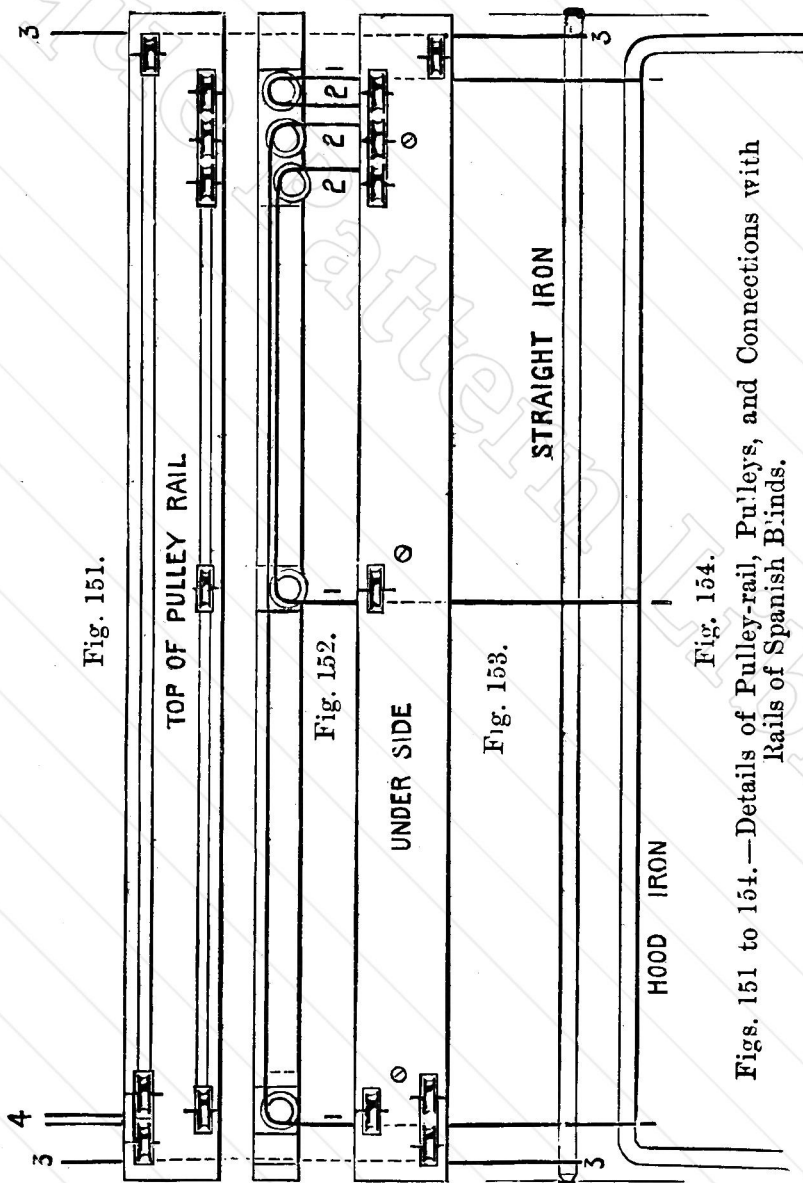


Fig. 151.

Fig. 152.

Fig. 153.

Fig. 154.

Figs. 151 to 154.—Details of Pulley-rail, Pulleys, and Connections with Rails of Spanish Blinds.

bent to the shape, or cut out of wood to the proper curvature and moulded by routers, or by gouges and chisels. This will modify the choice of moulding.

Figs. 147 and 148 show how a semicircular bead moulding can be fixed. It effectually hides any slack fitting of the frame and window opening; but that must not be taken as an excuse for careless measurement.

The roller consists of a spring roller in a steel barrel fitted into plate brackets, either fixed to the top rail of frame or to another rail, or else to the pulley-rail. The spring roller is usually of 2 in. diameter, but for small windows $1\frac{1}{2}$ in. or $1\frac{3}{4}$ in. will be sufficient. It differs from the spring roller used inside apartments only in having no rack and cap.

The pulley-rail is made very much on the same principle as that of a Venetian blind, but as it is of great importance, Figs. 151 and 152 are presented to show its construction. It is shown in section at F (Fig. 147), where it will be noticed a space is left, intended to allow the cords to pass freely between the rail and that to which it is fixed. This space may be secured by making a wide groove in the upper face by fixing two thin strips, or by cutting narrow grooves in which the cord can lie and travel freely. There are several possible ways of fitting the pulleys, only one of which is given. In this plan (Figs. 151 to 154) the three cords drawing in the hood are drawn on the right side, inside the window, and the two cords which draw the hood up without gathering it in are shown on the left side. Some prefer all the cords to draw together, in which case, of course, the arrangement must be modified.

The hooks to fit the cords must be plate hooks fixed with screws, the hooks being fixed so that the prongs are divergent.

The cord should be $2\frac{1}{2}$ lb. unbleached flax patent cord. Obtain the best, which is cheapest in the end.

The irons are fitted as shown in Figs. 149 and 150. The straight iron is slightly reduced in thickness near each end, and is passed through the hole in plate at I (Fig. 149); the end is then

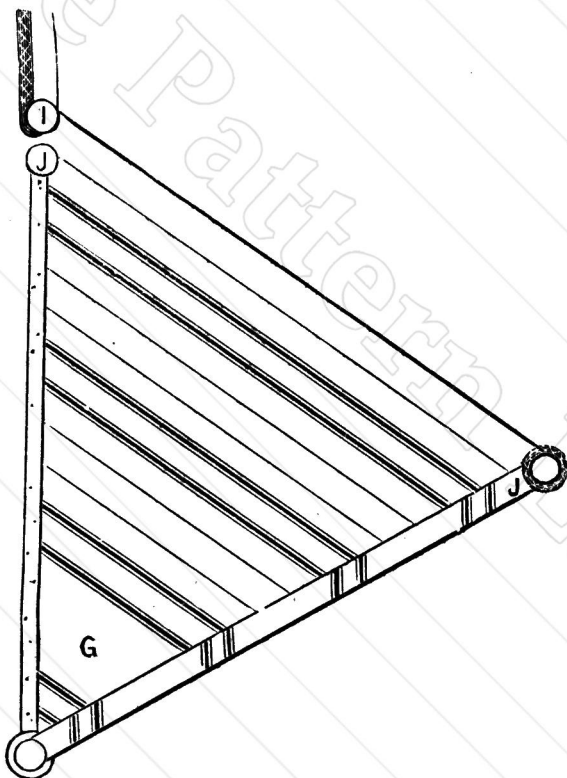


Fig. 155.—Gusset of Hood for Spanish Blind.

slightly riveted, just sufficient to prevent it coming out. The measurement needful to be given to the smith is the distance between inside surfaces of case for straight iron and the length of the hood iron at the sides.

It is important to understand the way to set out the place for the irons, and the form of the

gusset-pieces shown in Fig. 155. The distance from centre of hole in plate just mentioned to centre, L, must be in excess of the length of the side of hood iron, as may be seen by the arcs in Fig. 155. This is so arranged in order that the hood, J, when drawn in, shall be under the rod, I. The same figure shows how to set out the tick, which may be folded round I and sewn, or a piece of web may be sewn on behind the tick. The bottom of tick must be neatly sewn to the bottom iron, and the seam between front of hood and side of hood must be either on the angle or more on the gusset, as oblique stripes peeping round to the front look unsightly.

The centres, L (Figs. 149 and 150), can be bought ready for use, and the smith ought to be instructed to make the eyes at the end of hood iron agree with centres, L. A blind-maker's ironmonger will supply the proper fittings, and any other requisites, besides these special centres.

Tick for these blinds is made in most patterns in various widths, from 36 in. to 72 in., or even wider, at 6 in. difference in width to 60 in., and 12 in. above 60 in. The edge of gusset, not yet mentioned, is finally tacked to the slider, with a piece of web to make it neat and tidy.

The work of putting together and fixing is practically the same as for the Florentine blinds described in the next chapter.

CHAPTER VIII.

FLORENTINE BLINDS.

FLORENTINE blinds are less complicated than the Spanish, but do not afford the convenience of

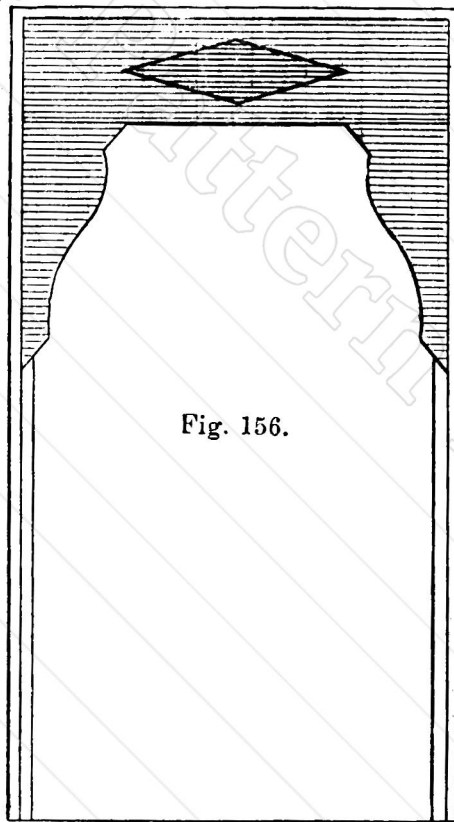


Fig. 156.



Fig. 157.

Figs. 156 and 157.—Elevation and Plan of Florentine Blind curved on Plan with Straight Sash frame.

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allowing the blind to be placed at any height required as do the Spanish. They do not, however, require a spring-roller, and they can be made to conform to a curved plan (see Figs. 156 and 157), or to a curved top rail (see Fig. 158).

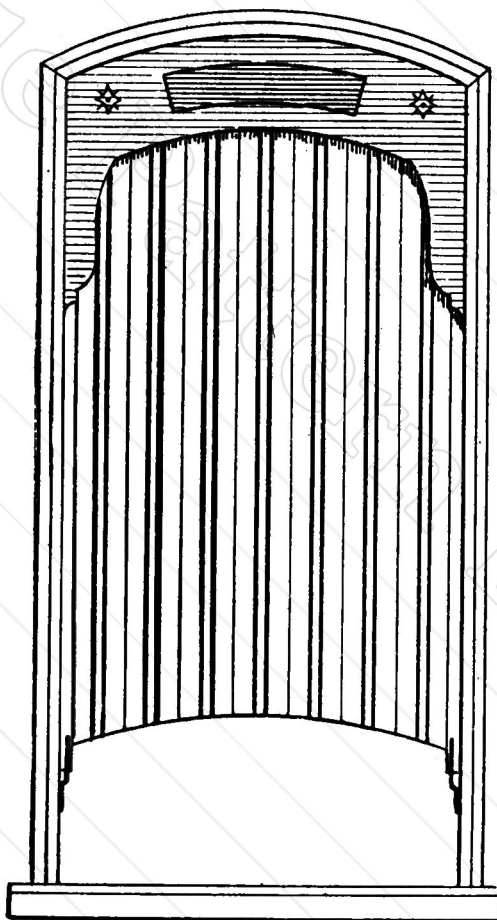


Fig. 158.—Florentine Blind with Curved Top Rail.

Fig. 159 is a plan of the pulley-rail, and Fig. 160 is a diagram of the tick, A indicating $\frac{1}{2}$ in. rings for cords, and B 1 in. rings for the side upright irons.

Straight openings are to be measured exactly

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as for the Spanish blinds described in the previous chapter, but if the plan is curved a straightedge may be laid on the sill from edge to edge, and the rise of the curve measured. Or still better,

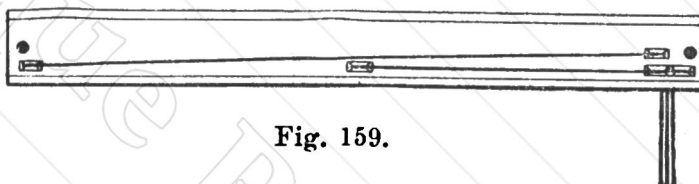


Fig. 159.

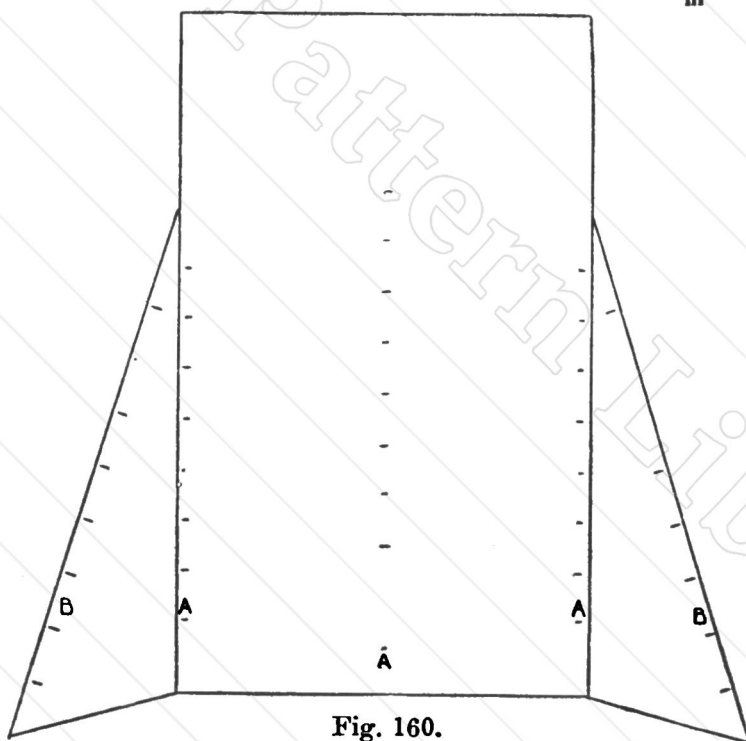


Fig. 160.

Fig. 159.—Pulley Rail for Florentine Blind. Fig. 160.—Diagram of Tick for Florentine Blind.

if the straightedge be held up to the soffit, and the face line marked upon it, the curve is obtained exactly. If the curve is not on plan, but is of the arch, a piece of wood cut into the opening and held up to the springing line, using a rule to

measure the rise of the arch, will afford sufficient data to enable the blind case-maker to draw the curve with accuracy. Of course, the construction of the case will be much easier if the lines are straight, but a method of building up the top or front rail in parts will render the making of curved blind-cases comparatively easy. Very rarely is the curvature on both plan and elevation. When on plan, it is an excellent precaution to fit the top rail into the place, and mark it for the particular window for which it is intended.

The top rail of 1 in. deal having been cut so that it fits the opening, the sides may be dovetailed to it, except when the reveals radiate so much that the dovetails would be too cross-grained, in which case rebate, glue and nail together. The sides of the case may be of $\frac{3}{4}$ -in. stuff. The width of the top, and as much of the sides as will be covered by the wings, must be reduced by the thickness of front and wings, in order that the front of these added parts may be flush with the edge of sides. The moulding, which has its inner edge even with the inner face of the sides, makes all neat, and overhanging on the outer side covers the joint between the wood sides of case and the reveals of the opening (see Figs. 156 and 157). If the case is curved on plan, then the best course to adopt is to lay the parts now united with the convex side upwards upon a bench or the floor; this is supposing that the top rail has been fitted accurately to its opening, and that it has been reduced by the thickness of the intended front.

A temporary strut is now required to keep the whole structure square, and some blocking to keep the centre of the front board up to its position. These two temporary expedients must be attached in any way that does not injure the case. Nails fixing to the floor or bench will do best.

The front will be made of two or three thicknesses of thin wood—best white deal or pine—and

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as the finished thickness need not exceed half an inch, $\frac{1}{4}$ in. stuff or less will do. Assume three thicknesses of eight or nine cut. One of the boards being first planed inside, can easily be bent to the place and carefully fixed with glue and fine wire nails. See that the centre support is doing its duty; if not, put a piece of wood upon it to make it support the thin front. The second thin board may now be applied, using thin hot glue and wire nails or brads, and avoiding contact with those driven into the first board. To this end it will be wise to use a small bradawl, but the whole fixing must be done quickly. A few hand-screws will be convenient to bring about a more perfect contact between these thin boards wherever it seems to be required. The third board can be fixed precisely as the second, when that is dry enough to remove the hand-screws.

The side wings may be cut out like those for Spanish blinds, but probably they will need to be somewhat larger.

The fascia-board, built up as described, will not usually exceed 7 in. in width, but exact sizes of parts cannot be given except on definite measurement of the whole. The sole object of both fascia and wings is to protect the tick from rain when drawn up, and the smaller of these parts, provided they serve this purpose, the better for the blind when it is in use.

Curved top rails for segment-headed windows are best built up. Cut out some pieces to the proper curve, deciding how many rows will be used, and how thick they will be. As the width of top and sides is usually about 5 in., and the top requires to be less by the thickness of the front, the thickness of four rows, for example, can easily be decided. Plane the board one side truly, and gauge to a thickness, or gauge and plane each segment to the proper thickness separately. As the butt-joints of segments are not to coincide,

decide how long they are to be made, dividing the length of top rail into two and a half or three and a half parts for the purpose. Glue and nail the segments together, making good butt-joints, and taking care not to put nails in contact, or where the plane will be used in cleaning off.

Straight frames take much less time, and require very little further explanation. All that has been said about Spanish cases applies, with the exception that guides are not required for Florentine blinds. Therefore the moulding may, if desired, be narrower, and it may be fixed flush with the inside of the frame instead of flush with the added guide.



Fig. 161.—General View of Swivel for Hood-iron of Florentine Blind.

The side wings are fixed to the fascia-board by tenons, which need not exceed 1 in. long; two or three tenons should be formed on each wing, mortises having been made with a $\frac{3}{16}$ in. chisel on the lower edge of the fascia-board. Avoid too tight fitting, and glue well.

The common ogee moulding, so often used for these cases, is most unsuitable, for only the weakest part of the moulding is fixed to the edge of the blind-case. A half-round bead, or a reeded moulding composed of two or three beads, is much to be preferred, especially if the blind-case is curved either on plan or elevation.

The irons for Florentine blinds are not quite the same as for Spanish. There is a hood-iron,

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but the ends of this iron have a swivel arrangement, shown in Figs. 161 to 163, enabling the hood-iron to move freely on the vertical rods which are fixed at a small distance from, and parallel to, the sides of the frame. These upright rods are fixed with screws to the lower part of side of case, and

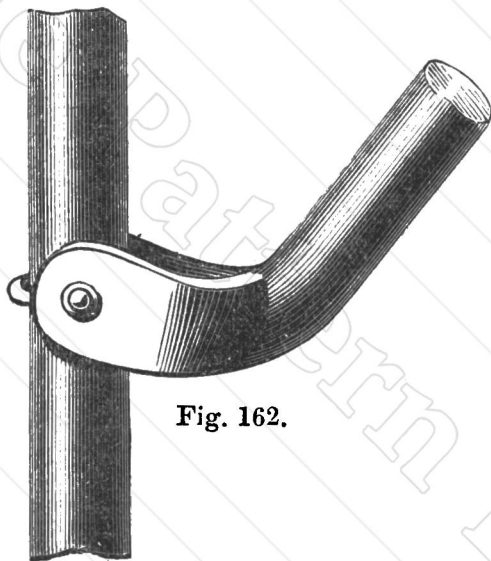


Fig. 162.

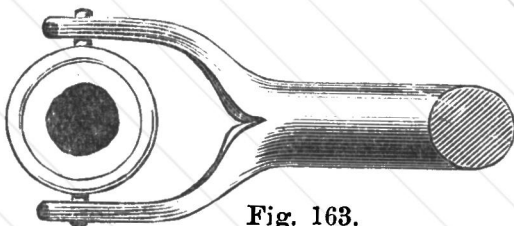


Fig. 163.

Figs. 162 and 163.—Elevation and Plan of Swivel for Hood-iron of Florentine Blind.

the upper ends are inserted into holes bored for the purpose in the pulley-lath.

The cording of a Florentine blind is on the same principle as a Venetian blind. The cords from the bottom or hood-iron are brought over pulleys to a convenient end of the pulley-lath, and can all be drawn together and made fast to a pair

of hooks. The sides of the blind are furnished with tinned iron rings, 1 in. in diameter, sewn on at intervals of about 9 in. The top of the blind-

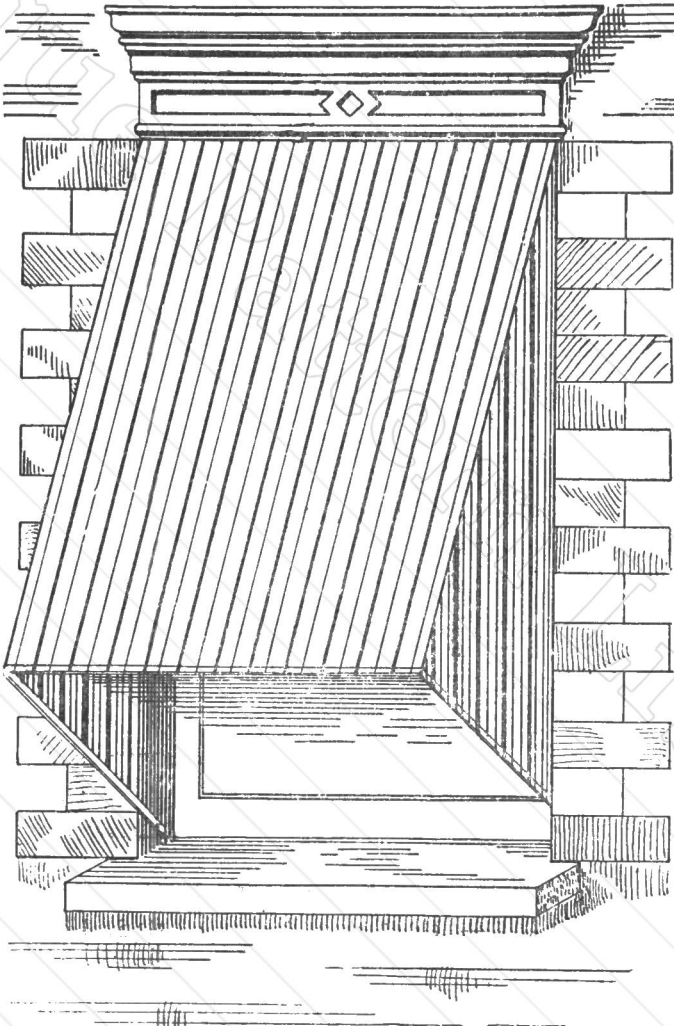


Fig. 164.—Florentine Sun-blind.

tick is fixed with tacks to the pulley-lath, while the bottom of the tick is hemmed and sewn on the hood-iron. Each cord is made to pass through a series of rings $\frac{1}{2}$ in. in diameter, sewn on in a

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straight line for each cord from top to bottom of the inner surface of the blind (see Fig. 160). When the blind is fixed, the side-irons are passed upwards through the swivel rings and the 1 in. rings just mentioned, which are sewn on the edges of the blind-tick for that purpose. The screws are then inserted in the holes provided at the end of side-irons. The cords previously inserted through the mortises in the pulley-rail are now made fast to the hood-iron, passing through the $\frac{1}{2}$ in. rings

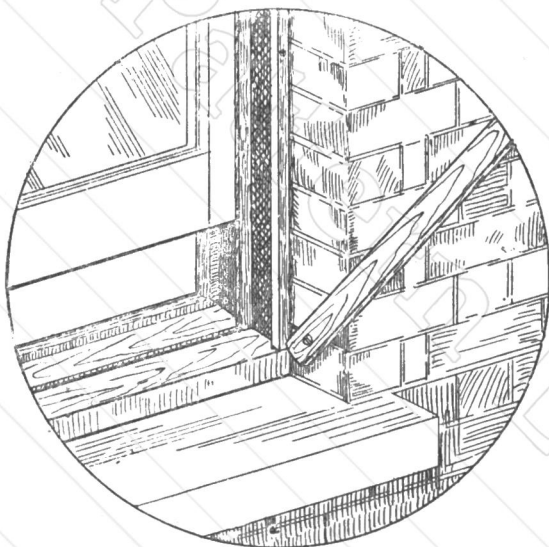


Fig. 165.--Detail of Florentine Blind.

as explained. The cords pass over pulleys precisely like those in a Venetian blind. In order to operate effectually, all the cords are united by a knot, which must be tied in such a position that when the blind is drawn up all the cords are equally tight.

If the blind is not completely drawn up under the shelter of the front board, it will become soiled in ugly patches, far worse in appearance than a uniformly dirty blind. The tick of a Florentine blind must fit well, but ought not to be tight, or

the first shower of rain to which it is exposed will shrink it so as to make the rising and falling a matter of difficulty.

The Florentine blind shown by Fig. 164 differs somewhat from the other blinds described in this chapter. It should be considered in connection with the outside sun-blinds discussed in Chapter VI. ; indeed, it may be fixed in a similar manner. If the fittings shown in Figs. 165 to 168 (see also Fig. 135, p. 85) are used, the blind may be fixed very cheaply. Fig. 165 alone needs explanation.

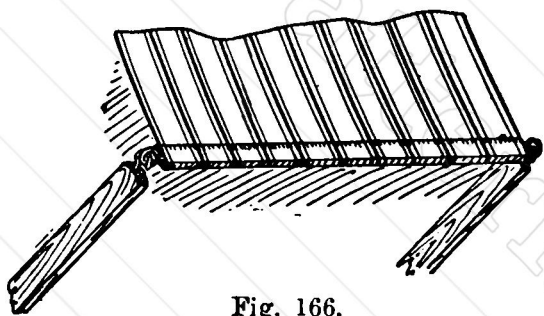


Fig. 166.



Fig. 167.



Fig. 168.

Fig. 166.—Detail of Florentine Blind. Figs. 167 and 168.—Hook and Eye for Florentine Blind.

To fix the screw make a hole, 3 in. or more deep, between the first and second brick above the sill, and fill this with a wooden plug, which should be nearly parallel and only very slightly larger than the hole ; saw off the top of the plug flush with the surface of the wall, and fix the supports with a long screw. Drive this in tightly, so that the supports may not move too freely. When the blind is not required it is unfastened at the top and at the supports, rolled up, and kept indoors. The supports then shut up out of sight, close against the window frame.

CHAPTER IX.

ORIENTAL BLINDS.

ORIENTAL blinds are semicircular at top, as shown in Fig. 169. With the exception of those altera-

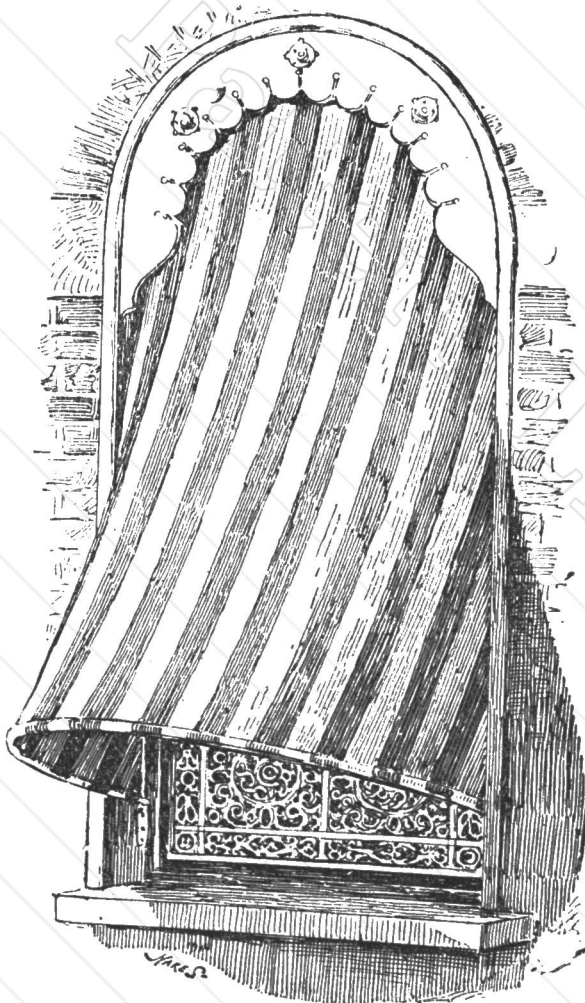


Fig. 169.—Oriental Blind

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tions consequent upon the special shape of the window frame, Oriental blinds are much the same as Florentine. A front elevation of the case and

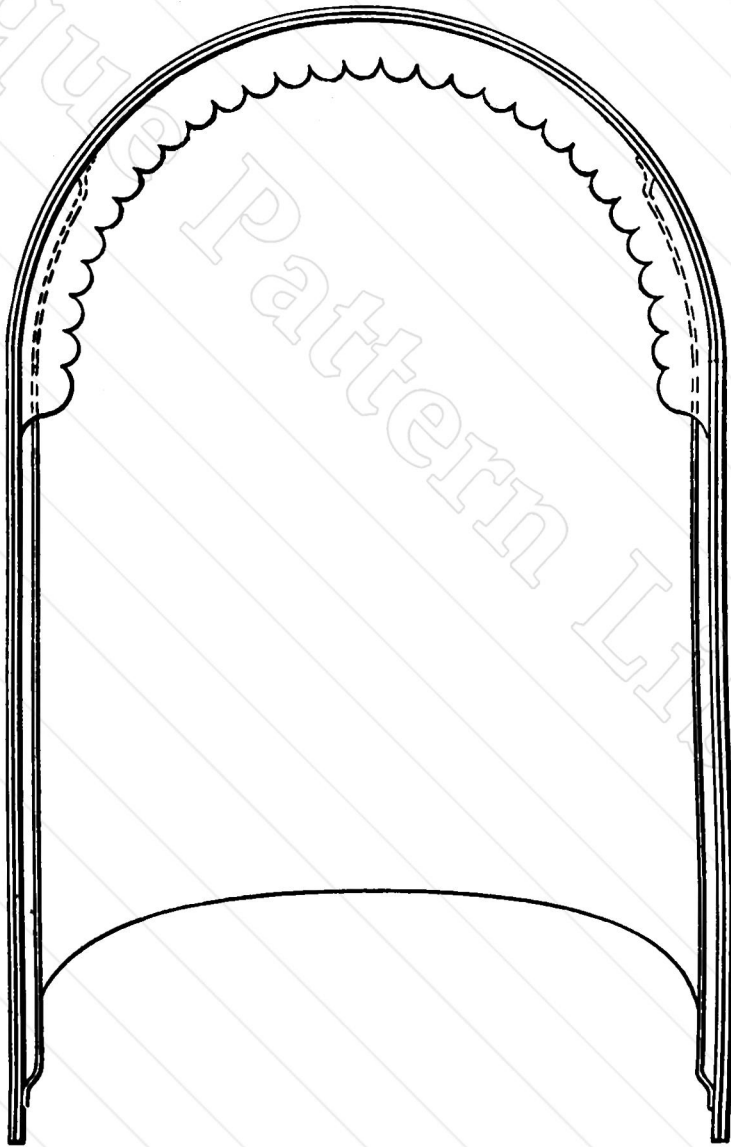


Fig. 170.—Front Elevation of Case and Irons for Oriental Blinds.

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irons of an Oriental blind is presented by Fig. 170; elevation of inner surface by Fig. 171; whilst Fig. 172 shows arrangement of the sheaves and cords.



Fig. 171.—Elevation of Inner Surface of Case for Oriental Blinds.

There are various modes of joining wood for circular work, but the plan that will probably commend itself to the blind-maker will be to take two or three thin boards, of width equal to the reveal, and bend them round a semicylinder, or inside one made to the outside size.

The fascia-board, of course, will be semi-circular on its outer edge, and it may well be cut to such a size that the thin boards may be bent round it as a mould. Of course, it will then need to be stouter than those used for the other blinds, but the inner edge can be reduced on the inner side, so as to offer no more obstacle to the action of the blind than a thinner board. It will be in several pieces, secured together with butt joints, with tongues well glued. It is of no importance which way the sides are fixed to the front, so far as appearance is concerned, as the moulding will cover the joint; and it would be injudicious to fix the front upon three thin boards, as the nails would split the wood or open the joints. The thin boards composing the sides and top may therefore be in one length, and should be well glued together.

It will be found well first to fix these boards together at the centre of the top, and bend from thence to the straight sides, trying the whole to the mould and front before gluing together. Any little change in plan of operation, or difficulty discovered, can then be dealt with, and the gluing can be done without needless delay. Any cramps or hand-screws ought to be adjusted in readiness for the final fixing together; nail-holes should be bored, and those nails chosen which are not likely to split. The moulding ought to be of simple character and cut out of the solid, any joints in moulding being in different places to the joints in fascia-board. The whole may well be completed before removing the mould upon which the case is made.

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The irons for an Oriental blind are like those for a Florentine, except that the hood iron is semicircular instead of having angles. The swivels are the same, and the upright irons are fixed at the bottom exactly as the Florentine; but at the top the iron is bent to a curve parallel with the inner surface of the case, and fixed at some distance above the springing of the curve. It is not very particular how far the vertical irons are continued round the curve, but the irons might be made to reach the crown of the arch—in fact,

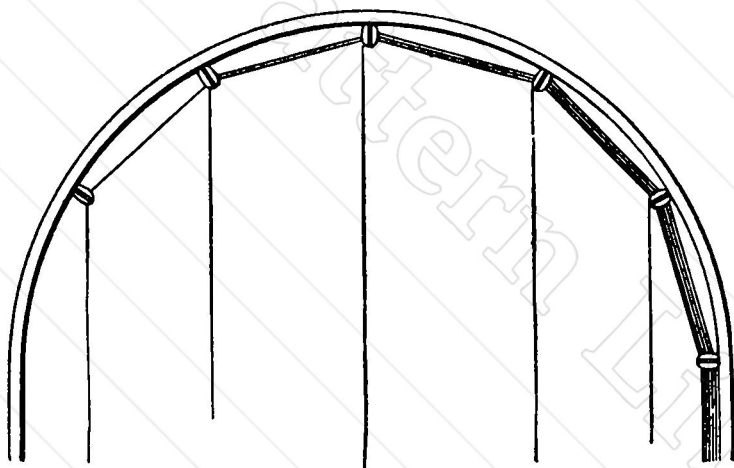


Fig. 172.—Sheaves and Cords for Oriental Blinds.

if the iron is well fixed, it would be an advantage to be so continued, as the blind could then be fixed to the centre, and a head-lath would not be necessary.

The shape of the tick is a little difficult to obtain, but if, when the blind is in use, the bottom of the hood is at right angles to the centre line of tick, then the bottom edge of tick may be straight and square. The rings on the sides are 1 in. in diameter, and the cord rings $\frac{1}{2}$ in. If the blind-tick has been properly sewn on the hood iron, a little care and patience will determine

the shape of the top. First, however, make sure of the centre, either tacking it to the top of case or a separate head-lath, or sewing it round the staple or bracket fixing the iron rods. A piece of blind-web may be used to bind round the iron, and thus fix the tick; but, in any case, make sure of the central position of the middle stripe of the tick. This done, the rest is a mere matter of care.

The fascia-board is 4 in. or 5 in. wide for ordinary blinds, and the edges may be cut in semicircles or not, as desired. Being narrow, it will not be necessary to put any ornaments upon its surface, though it can be done; the semicircles cut upon its inner edge will generally be ornamentation enough.

The 1-in. rings at the edges of tick are to be

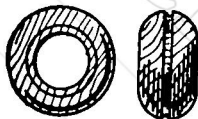


Fig. 173.—Hard Wood Sheaves for Oriental Blinds.

at distances of about 9 in. apart; and the cords to draw up the blind will pass through rings—also about 9 in. apart—on vertical lines on the inner surface of the tick. Instead of the cords passing over pulleys in a rail, it is usual for turned rings (sheaves, see Fig. 173) of hard wood to be fixed at the proper intervals, through which the cord passes, as shown in Fig. 172. These rings are provided with a turned groove outside, and are fixed with a wire passing round the grooved channel or head-lath and through the wood of the case, and made fast by twisting. A soft, tough wire is used for this purpose.

The width of the blind-tick at the bottom will be equal to the semicircle of the hood iron, but that will be its widest part. The length will also be from the centre of arch to centre of hood

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iron for the longest length; this may be seen in Fig. 171, where the position of the hood iron (when the blind is in use) is drawn at right angles to the centre line of the tick. This will greatly simplify the cutting of the bottom, because then, and only then, the bottom of tick will be straight and square.

When one end is fixed, the figure of the cover may be determined at the top by methods of the upholsterer rather than those of the geometrician. Though it would not be difficult to draw the envelope of an oblique section of a cylinder, it is quite unnecessary. The cords must be adjusted when the blind is drawn up, so as to ensure the complete protection of the tick when drawn; this is accomplished by drawing all the cords equally tight separately, and then tying all together in a knot. The irons—especially the hood iron—must be well painted, or the tick will soon be stained with iron rust.

CHAPTER X.

HELIOSCENE BLINDS.

HELIOSCENE blinds are perhaps the most modern of sun-shades. They were invented by Julius Jeffreys, and protected by letters patent dated 11th July, 1851 (No. 1551), now, of course, long since expired.

The cases are similar in appearance to the outside blinds previously expired (see Fig. 174). The blind consists of a series of hoods of blind-tick, fixed upon a set of frames made of light rod iron.

Fig. 175 will give an idea of these frames and their coverings, and how they are hung and connected. The illustration is a vertical section through the centre of the blind at right angles to the window, therefore also cutting the iron frames at right angles, but it is not drawn to scale, and is only intended to give a general idea of the construction, for the width of these frames, as well as their length, may be varied according to the size of the blind and the width of the reveal of the window. The circles represent in section the iron rods forming the frames, and the single oblique lines joining the circles the tick, while the double lines show the inclination of each frame.

It must be understood that the tick connects two frames, being fixed at the top to one, and at the bottom to the front of the next lower frame.

The frames are shaped as in Fig. 176, and the number required varies with the height of the blind, the width of each frame, and the distance apart they are set. The vertical line in Fig. 175

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represents a piece of blind web, of which there are two or more according to the width and weight of the blind. These webs are sewn to the tick

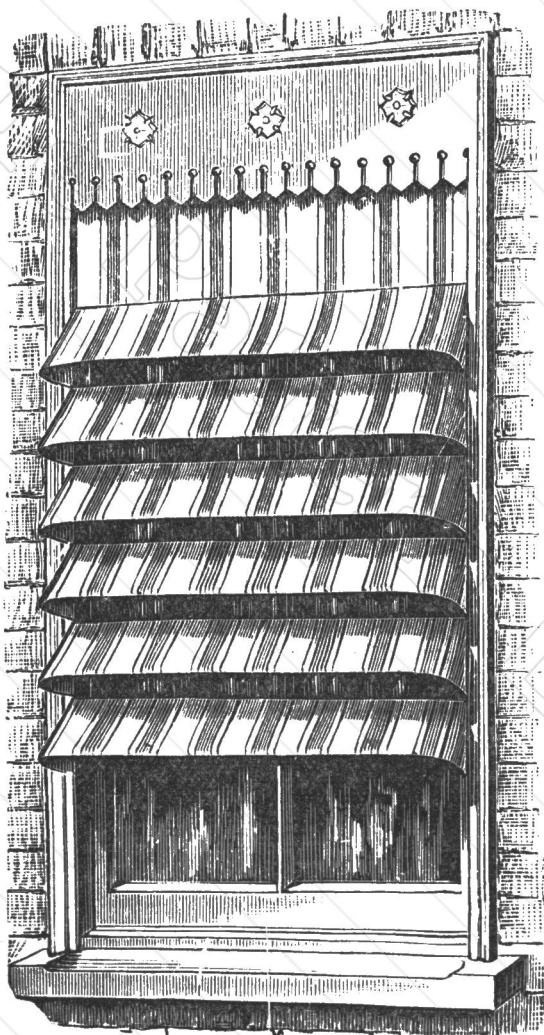


Fig. 174.—Helioscene Blind.

covering the horizontal rod which forms the straight side of each frame—that is, the side of the frame nearest the window—and serve to suspend the frames and therefore fix the hoods at

equal distances and proper inclination to each other.

The blind is drawn up by a pair of cords, each fixed at one end to the top of the case, passing downward through eyelet holes in each hood, and up again on the inner side of the blind, thus including all the frames when it is drawn up. These cords may then pass through pulleys like a pair of Venetian blind cords, and be led to the side of the frame precisely as is done in the case of Venetian blinds.

In some of the drawings of the original patent specification, the moving ends of these cords are coiled upon a roller, which may be a spring roller or an ordinary one. The objection to a spring roller for this purpose is that its power is increased as the blind descends, and diminishes as these hoods are gathered up. The patentee also shows the roller having a traversing motion by means of a screw, to enable the cords to be wound smoothly and in a single coil.

Every reader will know that if the sides of a triangle are unaltered the angles are unalterable. In the Helioscene blind the tick represents one side of each triangle; the frames, which are of uniform width, another; while the piece of blind-web, which is equally spaced out and sewn to the sides of the frames nearest the window, keeping the whole correctly parallel and at the proper distance, forms the common base to all the set.

The frames, shaped like an elongated letter D placed horizontally, may be of any width that is convenient; but as the reveals of an ordinary window are about 5 in., and the front of the case necessarily reduces the space by its thickness, the width of these frames can scarcely be more than 6 in., allowing a trifle for inclination.

In order that these hoods may be more effective in appearance, it is advisable that they should be

HELIOSCENE BLINDS.

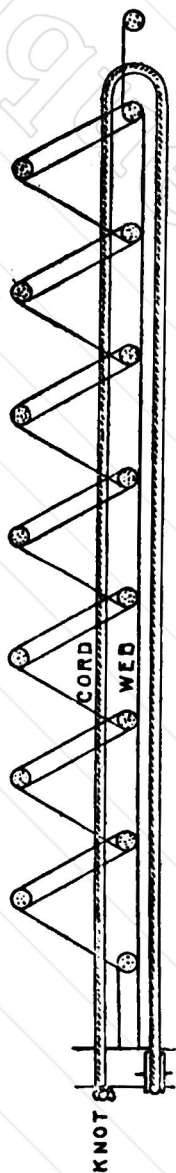


Fig. 175.

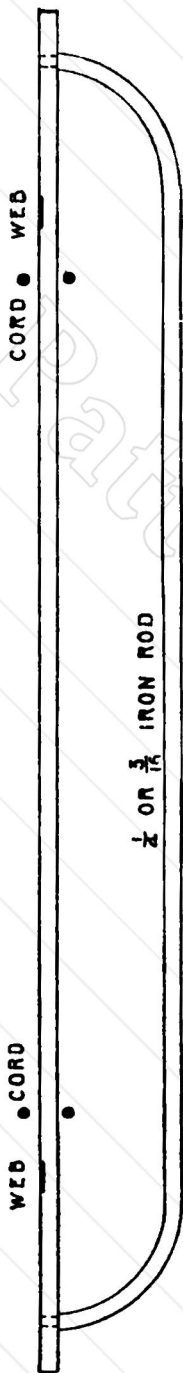


Fig. 176.



Fig. 177.

Fig. 175.—Section of Helioscene Blind. Fig. 176.—Hood Frame for Helioscene Blind. Fig. 177.—Inner Face of Case for Helioscene Blind.

brought to the front. This is effected by the leverage shown in Fig. 177, which it will be seen closely resembles a parallel ruler. The movable vertical bar also serves to keep the ends of the frames in their proper position, so that the wind cannot displace them.

The distance apart of these frames, and the length of the tick used to connect them, depend upon the width of each frame, and may be fixed at the discretion of the maker. In Fig. 175 the width of the frames and the spacing are both equal to the length of tick; but the vertical height between the frames may be greater and the length of tick increased if desired. The object is to shut out the sunshine but yet to allow inmates of the room to see out as much as possible.

The fixing of the tick to the frames is likely to be the most troublesome job of the whole; but it is also the same, though to a smaller extent, in every form of outside tick blind. The sewing will be rendered less troublesome if each piece of tick is cut to uniform dimensions, parallel and straight, and if folded and creased, and the edges run or tacked before being sewn on to the iron.

The irons must be well painted, and if this is neglected the whole appearance will soon be spoilt.

Just as in a Venetian blind it is necessary to increase the number of webs and cords, so in this blind, which may be regarded as a Venetian blind in which the tick takes the place of a wooden lath, it is advisable to increase the number of cords and webs in proportion to the width of the blind. The eyelets mentioned should be of brass and of a size to allow the cords to pass freely.

The bottom of the blind has a straight rod inserted in a hem made for the purpose in a narrow strip of tick, as of course the series of hoods joining intervening frames must end somewhere; the finish is shown in Fig. 175 at the bottom.

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The top of the blind, in like manner, is formed by a plain piece of tick joined to, or forming part of, the top hood, and it does not need a frame to extend it, as the intermediate hoods require.

The cases for these blinds do not require the bracket sides and wing pieces that are employed to protect the gussets of Spanish and Florentine blinds, a 7-in. fascia being sufficient to protect the hoods when drawn up, so that the design of the cases resembles closely that of an outside Venetian blind.

CHAPTER XI.

FESTOON BLINDS.

FESTOON blinds (see Fig. 178) are of a rich and luxurious appearance, and may be made of any soft material; any hard dressing or stiffening in the fabric will render it quite unsuitable for the purpose.

Festoon blinds differ from roller blinds, and, indeed, all others, in the set of the fabrics which, instead of being as flat and free from creases as possible, hang in that studied carelessness so attractive to many persons. In the drawing up of the blind there is a resemblance to sunshades and to Venetian blinds, inasmuch as cords passing through rings serve to draw them up, and the accumulated fabric is gathered together much as the laths of a Venetian blind when it is drawn upwards.

Much of the effect of the blind will depend upon the arrangement and skill of the needle-worker, and the housewife's help will be invaluable. In many masculine hands the festoon blind degenerates into mere bagginess.

The festoons should be in an odd number, as that gives a better effect and allows, if desired, a lower droop in the centre, so as to secure the effect of a catenary curve.

The pulley-lath, of 1-in. pine, $2\frac{1}{2}$ in. wide, cannot be set out until the number of scallops has been decided. This manifestly depends on the width of the blind, being never less than three; in the case of wider blinds about 12 in. will serve as an average. The material required will be double the length of the finished blind, and the

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width must be in excess of the opening in about the proportion of one-third added to the width of finished blind. This will be sufficient for hemming, etc.

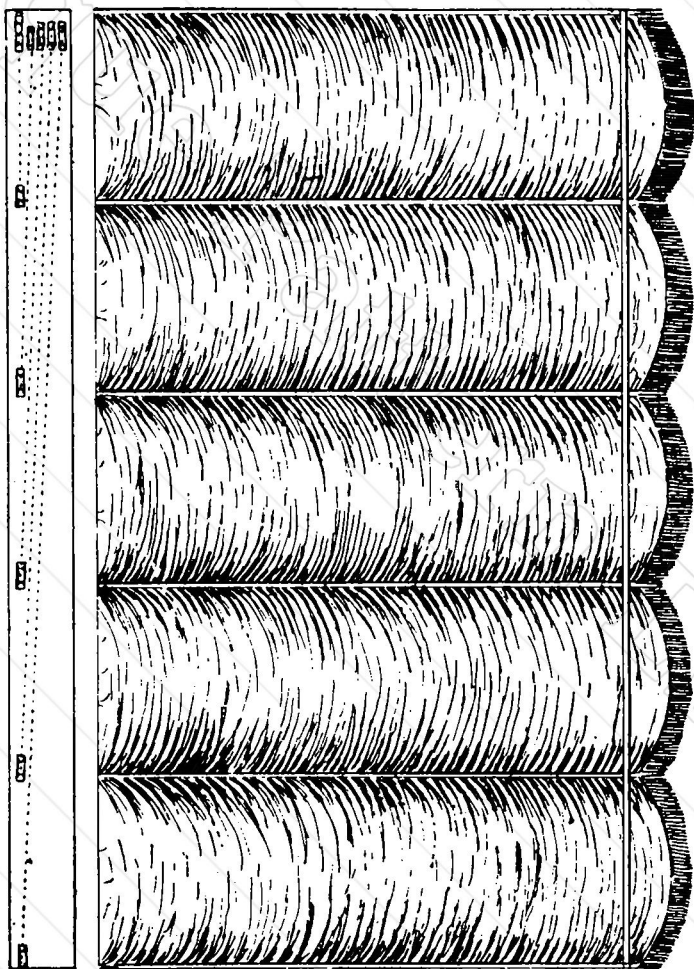


Fig. 179.

Fig. 178.

Fig. 178. — Festoon Blind, showing Lath and Gathers. Fig. 179. — Upper Surface of Pulley Lath.

In cases where a wide blind is in excess of the width of material, the seam must be made coincident with the line of cords and rings.

Assume that the hemmed material is upon the table. Allowing each scallop width for a graceful droop, divide the stuff into the required number of parts, ruling equidistant lines to indicate each row of gatherings.

Put a pin or a stitch of coloured cotton on each line at, say, each 12 in., so that when a line of running stitches is made on each line there will be an opportunity of drawing each equally to the proportion previously decided upon.

It will be of some assistance if the bottom stick is cut to the finished width of blind, and divided into the proper number of equal parts; this, compared with the material, will soon reveal any fault in the spacing of the material. If satisfactory, each of the inner lines may be bound with a strip of the material prepared (by folding in the edges) and sewn on to the gathered stitching, the strip being used to gauge the gathers to equal fulness. The two outer strips of stuff had better be felled on to the blind, regulating the fulness in the same way as the inner strips. On all these strips small rings must be sewn at intervals of about 4 in. It is important to have smooth rings, or the cords will soon be frayed.

The pulley-laths may be made like a Venetian blind—that is, with pulleys set in mortises made at appropriate places, as shown in Fig. 179—or they may have a turned wood sheave or thimble through which one or several cords may pass. This method ensures a silent action.

The bottom lath should be covered with the material which forms the blind, and it is better if it is of heavy wood. Some use a metal rod for this purpose, while others are of opinion that a few dress weights hidden in the hem of the blind are sufficient to ensure the blind falling promptly to its place.

The rod or lath may be, by means of its covering, sewn to the vertical tapes or bands on which

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the rings are fixed, care being taken to keep the distances correctly spaced. The ends of the cords will also be sewn to the covering of the bottom lath.

The blind is tacked to the edge of the pulley-lath with $\frac{3}{8}$ -in. tacks; longer tacks may interfere with the action of the pulleys.

The cords will be of glacé thread, $1\frac{1}{2}$ lb. to the gross of 144 yd., and must be threaded through the pulley-lath as the maker has intended. This may be seen by reference to the dotted lines in Fig. 179, which are intended to show how the cords are brought to the right-hand end of the pulley-lath. The screw holes must be bored so that the holes come between the cords, and grooves should be cut as the dotted lines are drawn, or else narrow strips of wood, $\frac{1}{4}$ -inch thick, should be fixed along the edges of the upper surface of the pulley-lath.

The fixing of the blind is like that of a Venetian blind, with screws through pulley-lath into the sash frame or under-side of its lining. If not convenient to fix thus, the pulley-lath may be fixed with brackets to the architrave.

The bottom of the blind may be edged with fringe, or a wide gimp trimming, and the cords may be made fast when required by a Young's holdfast hook (see Fig. 28, p. 24) or any of the patent cord-holders used for Venetian blinds.

CHAPTER XII.

SHOP FRONT BLINDS.

THE simplest form of outside sunshade for a shop front is the hung-out blind, which consists of ticking or canvas furnished with rings, by which it is suspended from hooks inserted in the fascia and jambs of the shop front. But such a blind completely hides the window, and so is hardly ever used; it may be remarked in passing that, especially if the material is striped, the seams or selvages should be vertical.

In a better form of hung-out blind, the top, as in the old form, is suspended by rings from

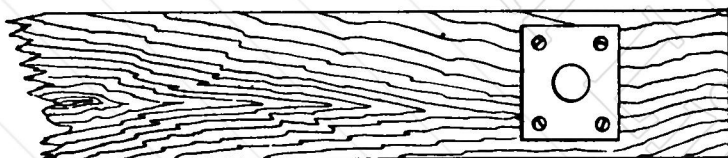


Fig. 180.—Bottom Rail of Shop Front Blind with Plate.

hooks in the fascia, and the bottom or lower edge is stretched on a wooden rail (a piece of deal quartering 3 in. by $2\frac{1}{4}$ in.) the full width of the blind, to which it may be fastened by tacks. This rail, with the attached blind, is projected from the shop window by side-irons, provision being made for fastening the rail to the ends of the iron rods (see Fig. 180). Figs. 181 to 183 show the iron rods and their attachment to the pilaster or any convenient vertical surface. These must be fixed so as not to offer any obstruction to traffic; their height must exceed 7 ft. (and if on a slope must be measured from the highest ground), and their

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length must not exceed the width of the footpath, however narrow that may be.

The length of the projecting side-irons may be determined in the following manner: At that part of the day when the shop window is most exposed to the sun, hold a 7-ft. rod upright on the footpath at such a distance from the window that the shadow of the top of the rod just clears the bottom of the window. The distance of the rod from the

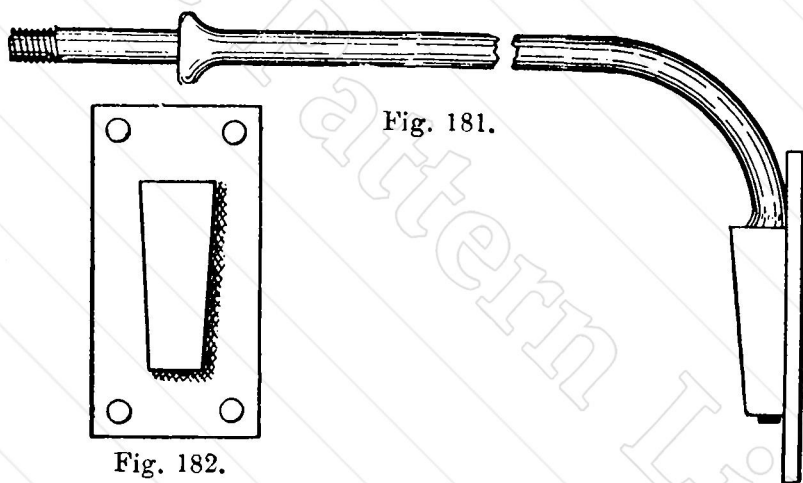



Fig. 181.

Fig. 182.



Fig. 183.

Fig. 181.—Front Bracket for Hung-out Shop Blind. Figs. 182 and 183.—Elevation and Plan of Socket for Bracket for Shop Blind.

shop front will give the requisite length of the side-irons. If, however, the footpath is not wide enough to allow sufficient length in order that the blind may completely shade the window, the desired result may be obtained by allowing a flap of ticking, or whatever material the blind is made of, to overhang the rail to the extent of 12 in. ; but it must hang free. The edge of the flap is usually scalloped, thus  and bound with fancy braid.

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It is important to remember, when nailing the blind on to the rail, to allow for the shrinking that will inevitably take place when the blind gets wet.



Fig. 184.



Fig. 185.

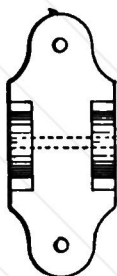


Fig. 186.



Fig. 187.

Fig. 184.—Fly-nut. Fig. 185.—Cotter or Wedge. Figs. 186 and 187.—Hinged Irons and Fittings for Box Blind.

The holes in the rail, where the side irons enter, may be protected with iron plates (see Fig. 180).

In fixing such a blind, the side-irons are first put in position; the blind may then be laid across the irons and unrolled, and when it is properly hung the rail is pulled out to the ends of the irons



Fig. 188.

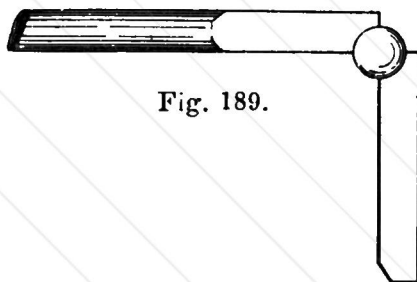


Fig. 189.



Fig. 190.

Figs. 188 to 190.—Hinged Irons and Fittings for Box Blind.

and either thumb nuts (Fig. 184) or cotter pins (Fig. 185) used to keep it in position.

Although the cost of such a blind is very

moderate, and anyone could make it with the aid of a smith, yet the fact that it takes at least five minutes to put out or take in is so serious a draw-

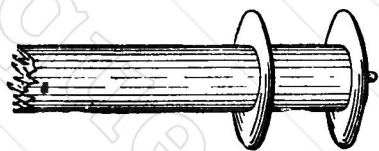


Fig. 191.

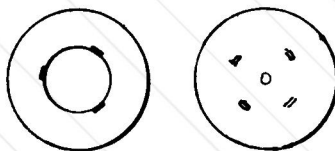


Fig. 192.

Fig. 191.—Roller fitted for Rope-raised Blind. Fig. 192.—Flanges for Ends of Roller for Rope-raised Blind.

back that the box-blind has almost entirely superseded it.

The box-blind is wound on a fixed roller, and the irons are pivoted to the pilasters of the shop (see Figs. 186 to 190). This of course necessitates a box, which usually rests on the cornice above the fascia, and in new shops space is sometimes provided within the limits of the cornice, the bottom rail of the blind, when it is rolled up, appearing as part of the cornice moulding. When a space has not been provided for a blind, a box must be made and fixed; but before this is done the manner of drawing up the blind must be settled. The old plan was to fit an iron reel (Fig. 191) at one end of the roller. To this reel a cord was fastened, and during the descent of the blind the cord coiled itself upon the reel. The blind was raised by pulling on the cord; but two persons were required to raise it—one to push the

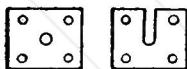


Fig. 193.—Plates to Support Roller for Rope-raised Blind.

blind up from outside the shop, while the other pulled on the cord. If, however, a spring roller is used, one person can manage the blind of a

moderate-sized shop; there are also the further advantages that the blind can be made wider by the width of the now unnecessary reel, and no hole need be made in the ceiling for the passage of the rope.

The box (Figs. 194 and 195) is made of two stout ends cut to the proper shape, so that the front is vertical, to ensure which the angle of top or cornice should therefore be ascertained. It must also be known if the rain may be allowed to run off at

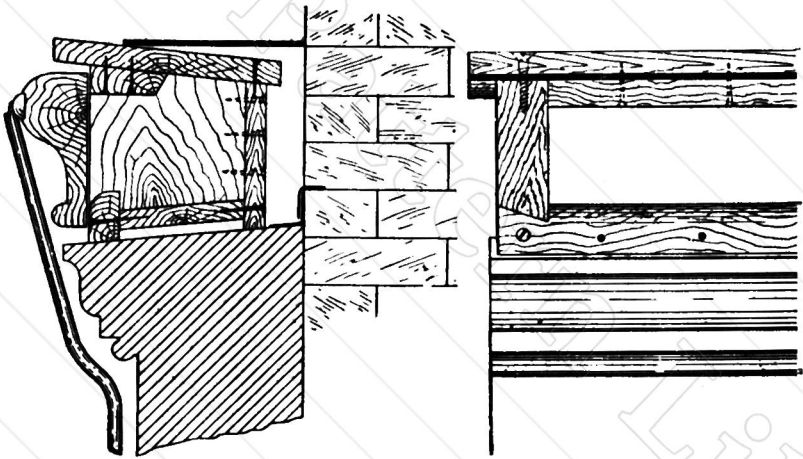


Fig. 194.

Fig. 195.

Figs. 194 and 195.—Section and Elevation of Blind Box.

the back of top or not, this consideration affecting the shape of the box.

The bottom and back of the box are both permanently fixed to the ends, and the top rail of the front is fixed to the top, which, together, are finally screwed on to the ends and back after the whole has been placed in position, and the roller, covered with the blind material, fixed in the end plates provided for it. The front of the box or bottom rail of the blind, to which its lower edge, the irons, are fixed, may be made of two thicknesses of $1\frac{1}{2}$ -in. stuff (Fig. 196), or somewhat lighter, as most convenient or may be moulded to

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an ogee form (Fig. 197). In this case the rail is about 6 in. wide, 2 in. thick at thickest part, with the ogee terminating in a 1-in. bead struck before the hollow is made. If many are required, it may be cheaper to buy the bottom rails ready machined. If they are planed out, the stuff should be sawn something after the manner of sash-frame sills, the proper dimensions being supplied to the sawmill people.

From the description it will be seen that the top of the box alone is removable, and that the front rail being removed with the top permits the roller to be taken out when desired; and if the



Fig. 196.

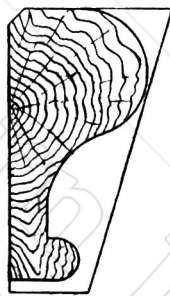


Fig. 197

Figs. 196 and 197.—Alternative Sections of Bottom Rail for Shop Front Blind

screws in the irons are removed, blind, roller, and bottom lath come away together, which would not be the case if the top rail of the box were permanently fixed to the ends. The ends of the box ought to be of 2-in. stuff; oak or elm is preferable, but deal, if perfectly sound, will answer the purpose.

The size of the box depends of course upon the diameter of the roller. For a shop blind, the roller should never be less than $2\frac{1}{2}$ in. diameter, and for long rollers may be as much as 4 in.; for example, exceeding 9 ft., roller 3 in. diameter; exceeding 12 ft., $3\frac{1}{2}$ in.; exceeding 14 ft., 4 in.

As to the length of side-irons for roller blinds,

the same regulations apply as in the case of hung-out blinds; it must be noted, however, that the irons cannot be of a length to project much beyond the height at which the roller is fixed. In the case of a lofty shop and a wide footpath this does very well, but if the cornice is low, or the path narrow, sliding irons may be needed to get the required shade. These are hinge-jointed like the others (Figs. 186 to 190); but, besides this, provision is made for raising the centre, by which means the blind can be projected farther, because longer irons can be used, and when the blind is down, the elbows can be pushed up and secured with a pin, or in some other way, so as to be above the regulation height. Figs. 198 and 199 show one form of sliding iron, in which the jointed iron is made to work on a pivot fixed in a wrought-iron sleeve, which also embraces a vertical iron fixed at its top and bottom to the pilaster. This joint can easily be made by folding the hot iron over a square rod of the proper section, and bolts and nuts or rivets may be used to join the iron and to furnish centres for rollers, which are sometimes used to facilitate the up and down movement, as shown in Fig. 199.

The smith who prepares the irons will take the offset of the cornice; this he generally does with a piece of stout composition gas-pipe, which bends easily enough to make a template, and with care will retain its shape. The joint shown in Figs. 189 and 190 can be bought of wholesale dealers in ironwork for carriages and wrought-iron goods. The smith frequently prefers to obtain these joints and weld them to the blind irons. That shown in Figs. 186 and 187 is made of annealed cast-iron, and is largely employed by blind-makers, who commonly have a number cast and kept in stock. It may be found on sale at blind-makers' ironmongers, or by those smiths who make a speciality of blind-makers' ironwork.

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The roller shown in Fig. 191 may be of wood or tinned iron barrel; if of wood it is customary to make it of two pieces of wood fixed together, but the metal cylinder is stiffer and better; and if a spring roller is too expensive, the reel can just as easily be fixed on the metal roller as on wood. A metal roller should be painted, and the

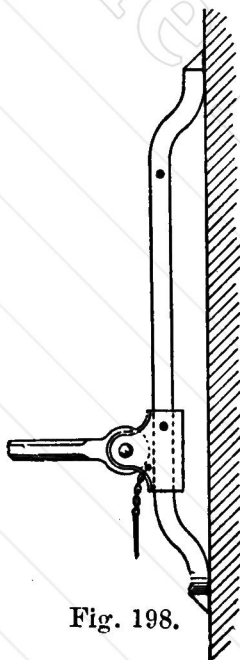


Fig. 198.

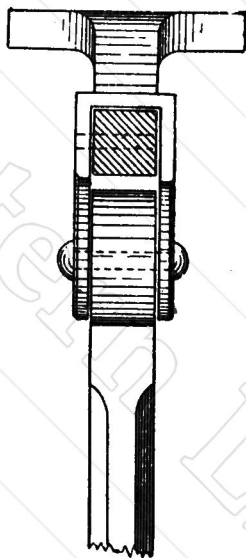


Fig. 199.

Fig. 198 — Sliding Iron for Shop Front Blind. Fig. 199.— Joint of Sliding Iron for Shop Front Blind.

tacks which fasten the material to the bottom lath should be similarly protected.

In any case, a long arm must be provided. It should be of ash and about $1\frac{1}{2}$ in. diameter, strong and straight in the grain, and furnished with a hook of the proper shape, not too curved at the ends or it cannot easily be inserted into the eye on the bottom lath. If the smith makes this hook and ferrule, etc., to size and pattern required it will be more satisfactory than buying

it ready made. See that the plate is large enough same diameter at each end, and must be fixed is inserted to pull down or push up the blind, or ugly jagged wounds will be made by the hook in its daily use.

The roller must, of course, be straight, of the same diameter at each end, and must be fixed level; the two side-irons must be of equal length, each being a radius rod to the blind. The cloth must be rectangular, each side parallel, and the ends square with side edges; and it will not do, if the width of blind demands $4\frac{1}{2}$ breadths, to hem the half breadth and leave the other selvedge single thickness. In such a case it is advisable either to have five breadths and a wide hem on each edge, or to put a narrow breadth in the middle. In shooting the top edge of back of box see that it is "rounding," that is, a trifle high in the middle rather than straight, as that will help to keep the top from drooping in the middle, which it is otherwise very apt to do.

The fixing of the box may be made more secure by iron bars or straps fixed to the top of the box and to any woodwork above the shop, or cemented into the brickwork of the house. Much depends upon circumstances how the box shall be fixed, but the action of the wind on a blind perhaps measuring 150 sq. ft. must be considered, and suitable fixings provided.

Many blinds are, for this reason, provided with a chain at each end, supporting the irons and bottom lath, independently of the cloth. In cases where an end blind is required it is well to provide these chains, as the blind ticking or canvas frequently stretches in length under the weight of bottom rail and irons, which stretching increases the shrinkage in width that takes place when the blind is wetted, and so alters the adjustment of the end blind.

Regarding the choice of material for the blind,

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for a shop nothing is so good as a self-coloured cloth, but if a striped ticking is chosen, it should be of quiet colour. A showy ticking may look

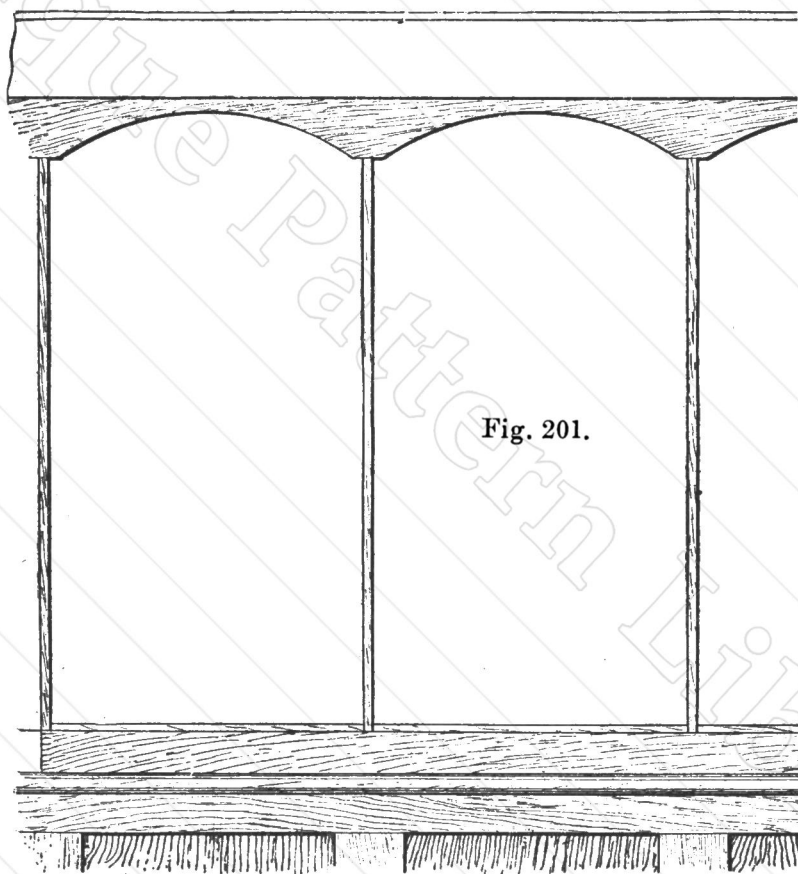


Fig. 201.

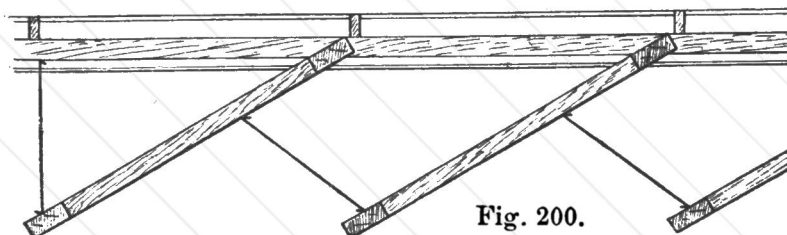


Fig. 200.

Fig. 200.—Plan of Frame Blind for Shop Front. Fig. 201.—Elevation of Shop Front to be fitted with Frame Blind.

well from the outside, but the bands of transmitted colour derived from it may not improve the goods displayed.

Where a box blind is objected to, there is a plan of shading the shop window which is both simple and cheap, but this—the frame blind—is only suitable for those cases where only either the

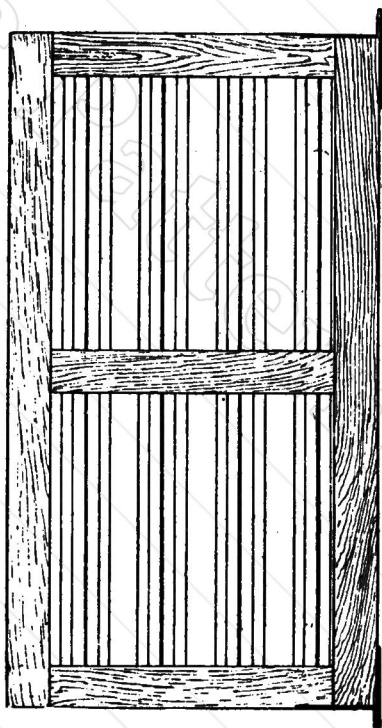


Fig. 202.—Shutter Blind with Tick Panels.

morning or the afternoon sun has to be reckoned with. In shops whose aspect is due south the angle at which the blinds are set would have to be altered about noon.

The frames are shown in plan at Fig. 200. The front to be fitted is shown by Fig. 201. The width of each frame may be about the width of each pane of glass, supposing them to be of moderate width, and the projection must not be too great.

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The angle at which they are shown fixed in the figure is at 30° from the front.

The frames may be made of yellow deal 3 in. by $1\frac{1}{4}$ in., with top and bottom rails of same section, and two or three intermediate rails, accord-

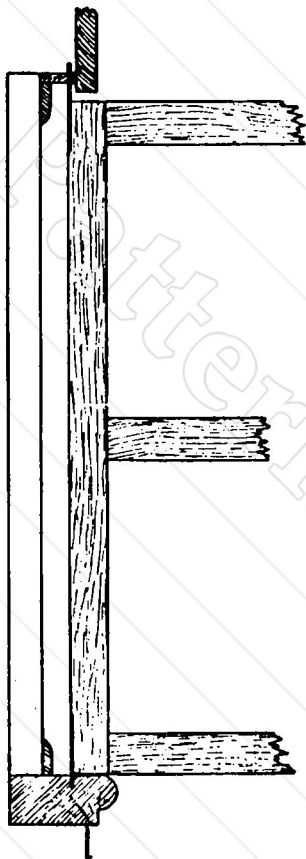


Fig. 203.—Method of Fixing Shutter Blind to Window Sill.

ing to the height (Fig. 202). The ticking or canvas may be in one piece, entirely to cover the frame, or may be put on in separate panels. The frames should be painted before they are covered, and it would be better for all fitting to be done before covering.

The frames must be cut about $\frac{1}{2}$ in. shorter than

the distance between the lower front edge of the fascia in front of the shutter groove to the stall board sill on which the sash rests (Fig. 203). The irons on which they are pivoted enter holes above and below, as in Fig. 204, and the shape of the iron fitting is shown in Fig. 205. The bottom fitting is like the top one except that the pivot should not project so much, as shown in Fig. 205. The frame is put in position by fitting the top pivot in the hole in shutter groove and placing the frame in its proper place on the sill, lifting it

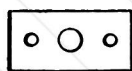


Fig. 204.

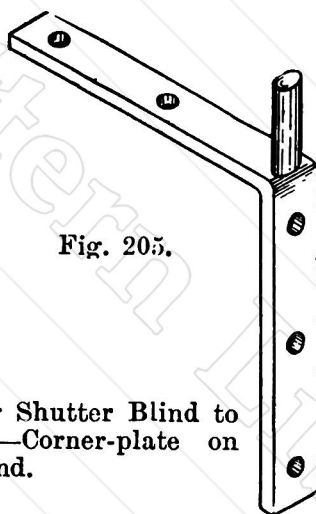


Fig. 205.

Fig. 204.—Plate for Fixing Shutter Blind to Window Sill. Fig. 205.—Corner-plate on Shutter Blind.

to allow the pin of lower plate to drop into its place. Whatever the number, the frames should be alike in width, and set at the same angle; this object can be secured by using hooks like casement hooks, with a staple or eye on a plate, as shown in Figs. 206 and 207. The size will depend upon the size of frames; but $\frac{1}{4}$ -in. iron rod will be strong enough, and 2-in. by $2\frac{1}{2}$ -in. by $\frac{1}{8}$ -in. iron will suffice for the plates.

If the hooks can all be made of the same size and pattern the frames will be interchangeable, but this is a detail that will depend upon circumstances.

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Inside blinds for shops are usually roller blinds, and though Venetian blinds are often used, they are not suitable where there is much dust.

As long wood rollers are apt to droop in the middle from their own weight, all blind rollers



Fig. 206.—Hook for Steadying Shutter Blind.

over 6 ft. long should be of metal barrel. If spring rollers are required, tinned steel barrels are indispensable; but when the expense of springs is undesirable, the metal rollers are better in every way. The ends are fitted with beech blocks turned to suit the brass end fittings. The holland or union generally used must be sewn on, as tacks can only be inserted near the ends of the roller where the blocks are situated. Rack pulleys being unsuitable for heavy blinds, single line rollers are used. These are made in various patterns and sizes, and it is desirable to have the cylinder on which the cord is coiled as large as the roller, to



Fig. 207.

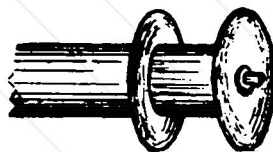


Fig. 208.

Fig. 207.—Staple for Steadying Shutter Blind. Fig. 208.—Single-line Fitting with Roller End.

prevent unnecessary strain on the cord. On the other hand, the distance between the flanges of the reel must be increased if the diameter of cylinder is greater, to afford sufficient room for a cord of ample strength. A single-line fitting

for a roller end is illustrated by Fig. 208. A suitable bracket or supporting plate is shown in Fig. 209. It is of tinned iron with a brass bush fitted in it, and can be bent at any place that will give room for the roller to work. The best way to fit up such a roller is to provide a strip of fairly hard wood, bend the plate brackets (Fig. 209) as short as convenient, and fasten them, as in Fig. 210, so that the lath alone requires fixing; that being done, no further adjustment is required.

With regard to measuring, two long rods, each



Fig. 209.

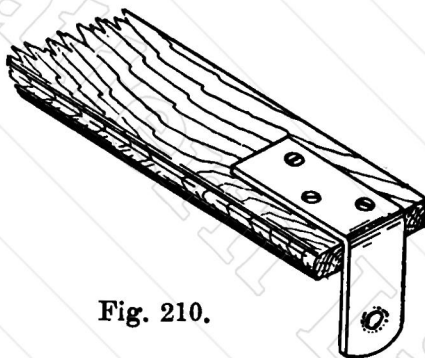


Fig. 210.

Fig. 209.—Plate Bracket. Fig. 210.—Screwed-on Plate Bracket.

rather longer than half the length of the opening, may be placed in position; if a bradawl is thrust through both while in position the accurate length will be secured. This should also be carefully measured when removed from the window; but it would be better if the rods can be screwed together and kept so till the work is finished.

Sometimes union or holland cannot be obtained wide enough for a shop window, though if white or buff is chosen, this difficulty will seldom occur. If red, or blue, or print is required, two widths may have to be joined together; this can be done with clean and fresh glue, or with dextrine. The operation requires some care and skill, the best

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plan being to allow the necessary lap, and put a few tacks temporarily to keep the blind in its place while the joining is done. Prints are well suited for this treatment, the pattern being matched after the manner of paperhangers.

The cords should be in the most convenient place for use, but when the blind is fixed close to

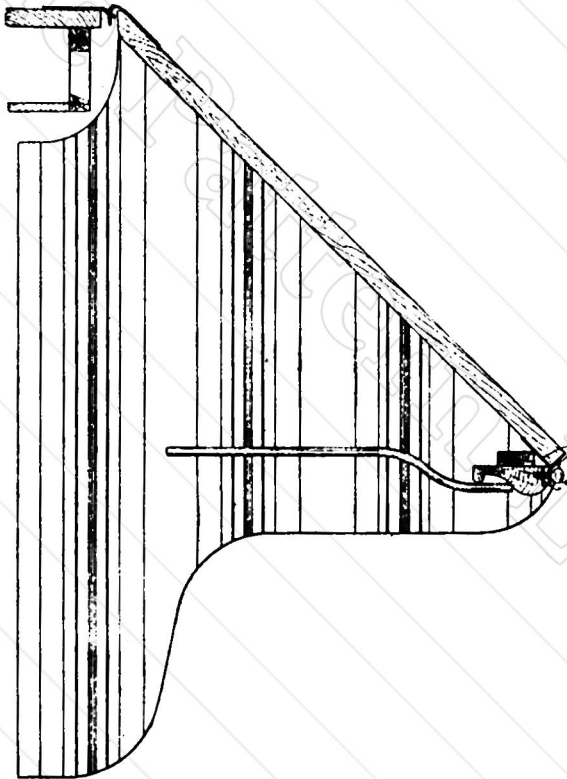


Fig. 211.—Side Shop Blind.

another blind at an angle bar, the reel should always be at the opposite end, as the blind is not diminished by the reel behind the style. In some cases it is desirable to make the blinds draw up from the sill; here a spring-roller is necessary, and cords at both ends of each blind advisable. Young's patent hold-fasts may be had in all sizes in both iron and brass, at low prices.

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WINDOW BLINDS.

The making of a side shop-blind for outside use will now be described. The end piece for a shop blind (see Fig. 211) is usually made with a piece of deal 2 in. by 1½ in., having at the top an iron hook, prepared by the smith. This hook is placed in the hole of an iron plate fixed on the top of the blind box; the lower end of the deal rod is fixed by a thumbscrew and plate. The length of deal rod, cloth, and the cost depend upon particulars not given; but if the blind-irons are 6 ft., the deal rod will be about 8 ft. 6 in., and so on. The length of rod is almost exactly the diagonal of a square of which the length of the iron arms of the blind are the side. The centres or hinges of blind-iron should not be less

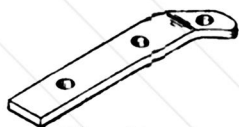


Fig. 212.

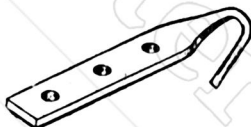


Fig. 213.

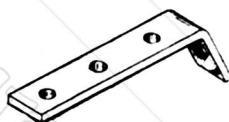


Fig. 214.

Fig. 212.—Bracket. Fig. 213.—Hook. Fig. 214.—Fitting for Lower End of Side Blind.

than 7 ft. from the ground, and the distance between the place where the box is fixed and the distance (7 ft.) which is regarded as necessary for foot passengers will give the length of blind-irons. Though 7 ft. is imperative between any iron or wood, the tick or canvas may be allowed to descend lower, if it is free; and shopkeepers usually want as much advantage from the blind as they can obtain. If canvas or sail cloth is used it is about 2 ft. wide, and is sewn by folding about half an inch and sewing the selvedge to the crease so formed; the folding is then reversed, and the other edge sewn as before. This gives a strong seam, double sewn, and for a half-inch double thickness at each seam; the width across the tick is equal to length of irons, and length of tick may exceed width for some distance from shop pilaster—by 3 ft. or more

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if the next-door neighbour is complaisant. The bottom extremity of the tick or canvas should have a ring sewn on, and a hook fixed in pilaster to suit the ring or rings. When a shop faces due south it is often required to use the end piece at either end of the blind; this can be done by duplicating Figs. 204 (p. 142) and 212, fixing them on the appropriate positions, Fig. 212 on the top of the box, and Fig. 204 on the edge of the bottom rail. If tick is used it may be had in various widths, from 3 ft. to 6 ft., at almost every 6 in. The edges of tick are either hemmed or bound with webbing, and it will be found best to fit the rod and its ironwork first, making the tick according to the directions just given; then, when the rod is fitted to its place, the tick can be fixed to the rod, making such adjustments as are found necessary to make stripes vertical. Small clout nails or large tacks and a piece of web complete the job. Fig. 213 is an isometric view of the hook, made of a piece of $\frac{1}{4}$ -in. wrought iron 10 in. long and $1\frac{1}{4}$ in. wide; Fig. 212 is a similar view of the plate for hook fixed on top of blind-box, also made out of $1\frac{1}{4}$ -in. by $\frac{1}{4}$ -in. wrought iron, and bent at an obtuse angle as shown; Fig. 214 is a fitting for the lower end of side blind; the screw for the plate used at the bottom lath of the blind is of the ordinary thumbscrew pattern.

CHAPTER XIII.

WIRE BLINDS.

WIRE blinds—really wire gauze or perforated zinc panels—are made as shown by Figs. 215 and 216. A light mahogany frame is made to fit into the opening of the sash frame between the beads, the latter being usually $1\frac{1}{4}$ in. wide, so that the blind frame from the face to the outer edge of the capping should measure $1\frac{1}{8}$ in. The moulding on the inner edge or next the glass should be cut

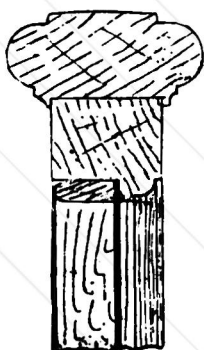


Fig. 215.

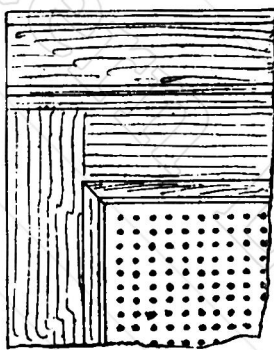


Fig. 216.

Figs. 215 and 216.—Corner of Perforated Window Blind.

in between the sash stiles. The blind is fixed by two blind bolts, one at each end of the capping, the bolt shooting into the bead on the sash frame. For panels, either gauze or perforated zinc is used, preferably the latter, especially when writing is to be done on the panel.

An ordinary form of frame for a wire window blind is illustrated by Fig. 217. Fig. 218 is an elevation of the joint (A, Fig. 217) to a larger scale. The tenon, mortise, haunch, and wedges

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are indicated by dotted lines. Fig. 219 shows the construction of the joint, mitring of the head which is stuck on the solid, and the rebate formed for the movable bead, which is not shown. The beads should be about $\frac{1}{2}$ in.

To fix wire gauze in a blind frame, place the frame on a clean, flat bench; lay the gauze on, and secure it along the bottom with $\frac{1}{4}$ -in. blue tacks. The tension is obtained by compressing the stiles slightly together and tacking towards the angle of the rebate, beginning at the middle of each stile and top rail and finishing at the corners. Bell

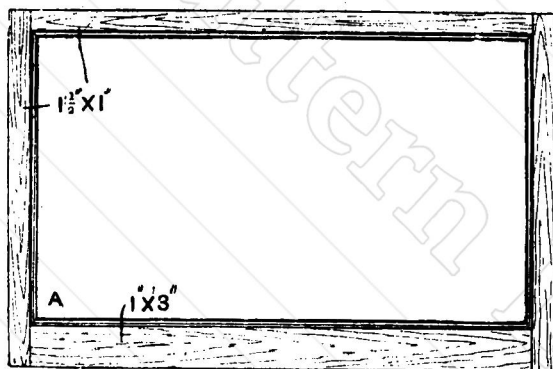


Fig. 217.—Frame for Wire Blind.

staples are sometimes used to obtain more tension, but straining too tightly makes the stiles crooked. For a brass tubular top rail, the gauze must first be cut to the outline, and a stout wire sewn with wire to the folded shaped edge. The prepared wire is then put in the top rail through the end, the gauze being passed through the cut in the tube; then spring in the tubular top rail, and proceed as described above.

For painting wire gauze, lay the gauze on a flat, clean table, and with a large stencil or other square-ended brush pounce the colour on sparingly, not with up and down strokes which fill the

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meshes. The colour, which must be thin, is mixed with turps, driers, and boiled oil; two coats are required. To dry, suspend the blind. Colour made with turps and a little gold size is also recommended.

Any space to be gilded should be filled up with dry white-lead mixed with gold size and turps. A little dry whiting dusted on the gauze will prevent the gold leaf sticking.

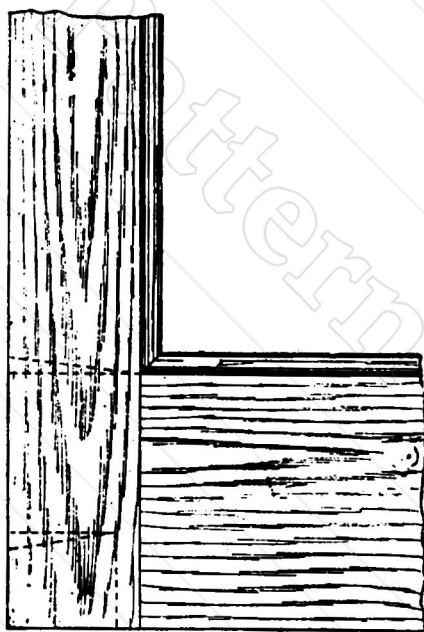


Fig. 218.—Joint at Corner of Blind Frame.

For writing on wire blinds so as to get clear, sharp-edged letters, the paint used should be mixed very thick, and should possess good covering properties. The paint is generally mixed with equal parts of gold-size, turpentine, and boiled oil, and should be applied very sparingly, otherwise it will run down the wire. Some workers use a mixture of weak glue and whiting for filling in. A simple and reliable way is to

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paste stiff paper on the back of the wire; when the letters have thoroughly dried, the paper may be easily removed by moistening with warm water. Flat lining brushes are generally used for this purpose. Lines, corners, and writing would all be arranged as in ordinary work of the kind. For the corners, it is better to have a stencil, as by its means the corners can be done cleaner and quicker. If it is desired to do away with the

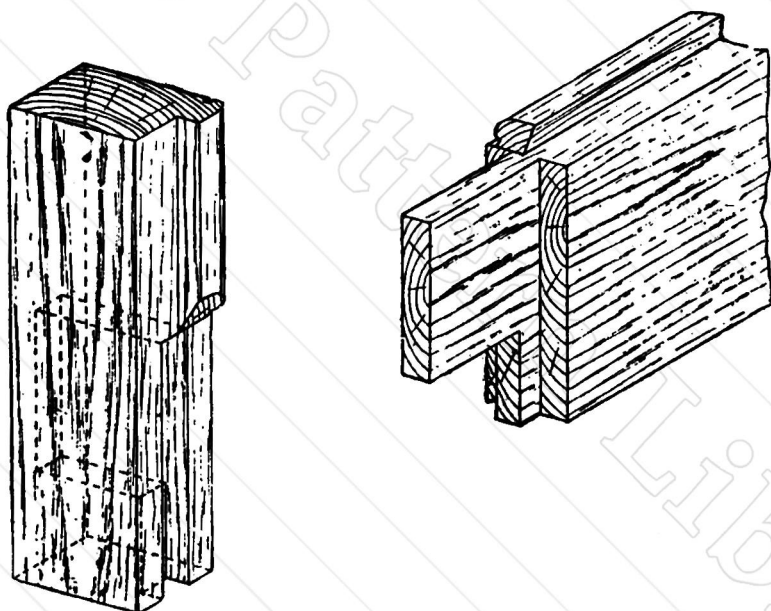


Fig. 219.—Joint at Corner of Blind Frame.

traces of the wire so that the work will be left smooth, it will be necessary to go over the lettering several times with the filling-in medium.

The raised effect of gold letters in relief is obtained by gesso treatment, generally with the aid of stencil plates cut from millboards. Alabastine would probably be the safest material for the beginner to use, although the relief may be produced by a mixture of plaster-of-Paris and weak size. Of course, the surface must be rubbed down and prepared in the usual manner with gold-size be-

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fore gilding. Another method of obtaining letters in high relief is to take two-thirds whiting and one-third white lead and mix to the consistency of varnish. This may be thinned with turpentine for use. Another way is to add $1\frac{1}{2}$ oz. of alum to a pint of water. Thin plaster-of-Paris with this medium, and apply. When dry, glue-size the letters before gold-sizing them. The latter way will require considerable dexterity.

Gold paper letters may be fixed to blinds in the following manner : Best quality gold paper is coated at the back with a strong gum. When dry, the letters are drawn or traced at the back, and cut out with sharp scissors. They are then wetted at the back and stuck upon the wire gauze or zinc, the words being previously set out on the blind in the usual manner. The gilt paper may then be varnished over with copal or any clear, hard-drying varnish, which will enable them to be washed at any time. In varnishing the letters, it is necessary to carry the varnish a little over the ledge of the letters, thus preventing the damp from getting at their backs.

CHAPTER XIV.

GLASS BLINDS.

THE glazed blinds so popular in the North of England are made in a great many shapes, but all have one design, namely, a wood frame carrying one or more sheets of glass; this glass is usually obscured or ornamented, but ordinary clear glass with coloured gelatine prints attached, in imitation of leaded glass, mosaic, &c., is employed.

One of the simplest frames is made from hard-

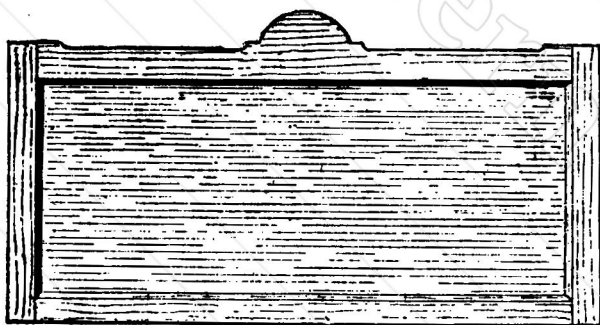


Fig. 220.



Fig. 221.

Fig. 220.—Framed Glass Blind. Fig. 221.—Section of Top Rail.

wood picture moulding jointed up by mitres, the glass being secured in the rebates by narrow wood fillets. No standard measurements for length and breadth can be given, as window-frames vary in shape and size all over the country.

Fig. 220 shows a neat blind, which can be cut from boards 1 in. thick. The bottom and side rails may be 2 in. wide, and may be dressed and rabbeted all in one length, the rebate being $\frac{1}{2}$ in. by $\frac{3}{8}$ in. The top rail can be got out of stuff 1 in.

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by 4 in., the inner edges of the frame bearing a $\frac{1}{4}$ -in. bead (see Fig. 221). The filling after the glass is put in is done by a separate bead moulding secured with brads. This design would look well if mahogany or walnut colour.

Fig. 222 shows a frame of heavier build than the previous one, and also divided by a central upright. The stiles are $1\frac{1}{4}$ in. square; the bottom and top rails (Fig. 223) are each in one piece, being housed into the centre piece and stump-tenoned into the ends. The rails are decorated by stop chamfers to within 1 in. of each joint, and

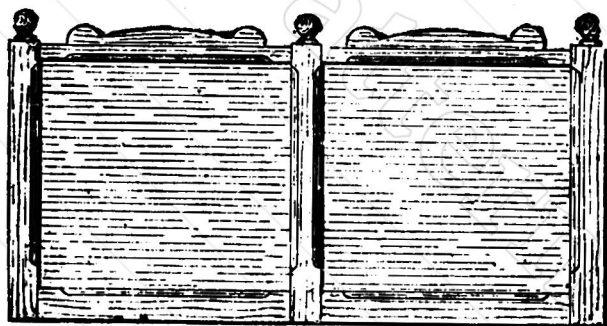


Fig. 222.



Fig. 223.

Fig. 222.—Two-part Glass Blind. Fig. 223.—Rail of Glass Blind.

the centre upright should be rebated at both sides to receive the glass and fillets. The blind top is finished by three turned wood tips (Fig. 224) and two small shaped pediments. This blind is suitable for being painted black or ebonised if made from hard wood, the chamfers being picked out in gold.

The blind illustrated by Fig. 225 has a spindle rail and pediment, the two side pieces, $1\frac{3}{4}$ in. by 1 in. thick, being decorated by stop reeds or flutes, as shown. The three horizontal rails are 1 in. square, and the two lower members only require rabbeting. The small spindles are $\frac{1}{2}$ in. by $1\frac{1}{2}$ in. long, exclusive of the turned tenons for fixing;

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see Fig. 226, which is a section, enlarged, at x x (Fig. 225). The pediment is $\frac{1}{2}$ in. thick and 2 ft. long, with a sweep of $2\frac{1}{2}$ in. to $\frac{1}{2}$ in. at each end.

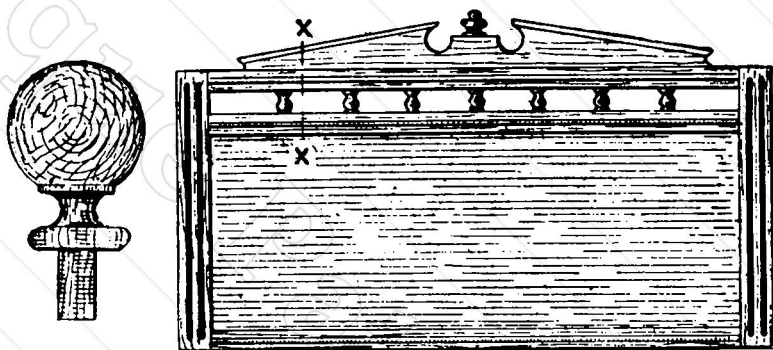


Fig. 224.

Fig. 225.

Fig. 224.—Knob for Blind Frame. Fig. 225.—Glass Blind with Spindle Rail and Pediment.

The top is fitted with an overhung cap-mould (see Fig. 226), and with a turned tip in the centre. This blind would be suitable for French polishing if made from hard wood.

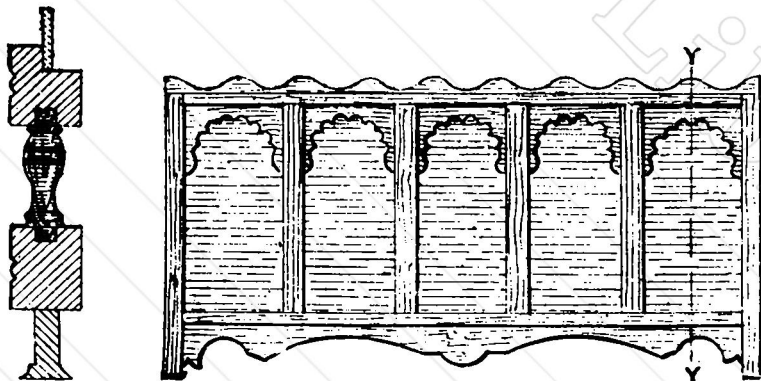


Fig. 226.

Fig. 227.

Fig. 226.—Sectional View of Blind Pediment, Spindle, etc. Fig. 227.—Anglo-Moresque Glass Blind.

A design in the Anglo-Moresque style is shown by Fig. 227, a section on y y being shown by Fig. 228; the design is very suitable for enamelling.

WINDOW BLINDS.

The whole of the sawn-out parts can be set out with a square and compasses, and Fig. 229 shows one of the semicircular fitments. The blind, if intended for enamelling, can be made of white-wood or canary wood, the framework being of stuff $1\frac{1}{2}$ in. by 1 in., and the fretworked portions of $\frac{1}{2}$ -in. stuff. It is well to know the thickness of the glass before constructing these blinds, as if a heavy glass, such as grained or rippled surface, is used, allowance must be made in the rebates, or the fillets will not fit properly. Various methods will suggest themselves for hanging the blinds, such as brass angle-plates, ring and screw, or small brass bolt bars.

The remainder of this chapter will show how

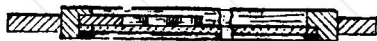


Fig. 228.—Vertical Section of Anglo-Moresque Blind.



Fig. 229.—Blind Ornament.

a stained and leaded glass blind is made. Such a blind is shown by Fig. 230, the assumed dimensions being 3 ft. by 2 ft. The design must be drawn to this size on lining paper.

The following tools are required: A glazier's diamond; a chisel-shaped knife, for cutting lead; an oyster knife, with blade slightly bent at point (the end of handle is cut off flat so that it will drive in tacks); a small pair of pliers; a pointed piece of wood, used to open leaf of flat outside lead; and a soldering bit.

The materials required are as follows: Cathedral rolled glass, about 6 ft., in four or five light tints; ruby glass, about 2 ft., for border along outside and round centre circle; window lead, about 5 lb. of "half-round" and 2 lb. of $\frac{1}{2}$ -in. flat out-

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side lead; a painted 6-in. bird circle for centre; fine solder; composite candles for greasing leads where soldered; and a few dozen last tacks.

The drawing is fixed on the bench or table by a tack in each corner; the glass must be cut slightly under lines to allow for lead; it must be cut very

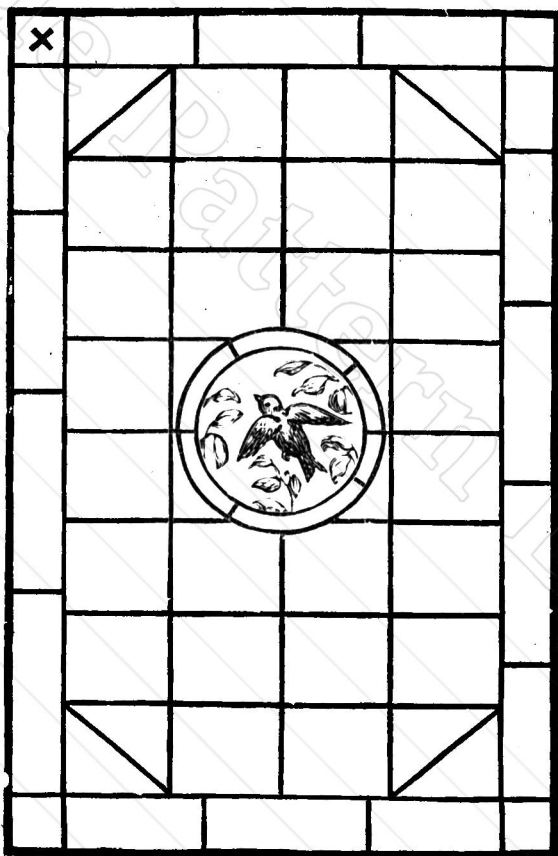


Fig. 230.—Stained Glass Blind.

accurately, and the corners taken off with pliers if necessary.

A piece of lead is twisted round the painted circle and cut off to size; the circle, with lead round it, is placed on the design where marked out for it, and the ruby border is fixed in, a piece of

lead being fixed between each two pieces of glass. The lead is cut under the glass, so that a long piece can be fitted round the ruby border. Solder the joints, and the centre can be taken off the design until it is wanted. Two thin lengths of wood are now placed along two sides of the drawing, forming an angle from left corner. Outside lead is fixed inside this; tacks are used to keep the lead and glass in position.

Straighten each length of lead by stretching before using it; place one end under the foot and pull the other end with pliers.

The first piece of glass put in is that marked x, and then the other pieces in that line. The border on the left is glazed in next, and then, after a few squares have been put in, the centre circle is joined on and the rest of squares fixed around it. All the work is done in the same way as the centre. Care must be taken to cut leads so that good joints are made, otherwise the soldering will be more difficult.

When all the glass and lead are in position, put two more thin lengths of wood along the remaining sides, and solder the joints of both sides of the blind. The soldering bit must be hot enough to melt the solder quickly without burning the lead.

The cementing and cleaning of the blind are done as follow: Black putty is rubbed into the leads of smooth side; this can be done with a painter's worn-out tool, care being taken not to injure the leads. The putty is cleaned off the glass with a dandy-brush and plaster-of-Paris; a sharp piece of wood is used to pick out putty that sticks to the sides of leads. The glass and leads are polished with a blacking-brush. When the other side has been cleaned and polished the blind is ready for fixing in a frame, which can be made of mahogany or deal enamelled. The frame is fixed into the sash with brass bolts.

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II

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