

### ANGLE RIPPING (Fig. 1)

This is accomplished with the guide fence tilted to the right. Loosen the Fence Tilt Handle and select the required angle off the Fence Tilt Scale and the same rules as apply to ordinary ripping should be observed. (See Guide Fence under Operating Adjustments Section.)

### CROSS CUTTING AND MITREING

When cross-cutting the accuracy of the work produced depends on several factors, not the least of which is the operator himself.

1. Firstly, for best results a cross cut or fine tooth blade should be used for this operation (See Types of Saw Blades).
2. The mitre quadrant supplied with the "Pacemaker" should always be used when cross-cutting or mitreing is to be performed. Free-hand mitreing like freehand ripping, is impracticable and inaccurate.
3. As the working face of the mitre quadrant is not large in area, it will soon become obvious that it is not an easy matter to hold timber of any great length against this surface and still produce accurate cross cuts or mitres. With this in mind one of the first projects of the operator should be to make up a piece of hardboard planed all round to measure approx. 14" x 2 1/2" x 3/4" and attach it to the mitre quadrant face by means of two countersunk head metal thread screws.
4. It should be practised by the operator, when performing cross-cutting work, to exert a slight pressure on the timber being cut so as to make it tend to open the saw cut being made. Under no circumstances should this pressure be applied in the opposite direction, as this can cause the timber to "pinch" the saw blade and the resulting "kick back" can be most uncomfortable for the operator.
5. A greater crosscutting capacity can be achieved by reversing the mitre quadrant in its guide track. The practice of holding a wide board against the mitre quadrant face and then lowering the board into the saw teeth is not only dangerous but is also very productive of squeezed fingers. Avoid it.
6. When squaring or mitreing timber which is in thickness somewhat less than the depth-cutting capacity of the "Pacemaker", a good plan is to raise the table to allow the blade to protrude through to the same height as the thickness of the timber to be cut plus the depth of the saw blade teeth. By following this procedure a larger working area in front of the blade is made available, and also it allows the operator a better view of the cutting point when working to pencil or scribed lines.
7. If it is required to produce cross-cut or mitre work pieces of a specified length use the stop rods supplied with the "Pacemaker" mitre quadrant. (Refer to Operating Adjustments Section.)
8. To obtain best results apply a drop of oil occasionally to the track area in the table top to ensure the mitre quadrant always slides freely.

### WARNING (Fig. 1)

During cross-cutting and mitreing operations on the saw always apply the Planer Guard Lock so as to prevent the Planer Guard from being accidentally opened during the cutting stroke.

### DADOING AND GROOVING (Fig. A)

For most operations of this type it will be necessary to remove the "Pacemaker's" Saw Guard and Splitter. (Refer to Operating Adjustments Section.)

Both the operations of Dadoing and Grooving are quite easily and effectively performed on the "Pacemaker" saw bench. Take, for example the following. It is desired to cut out a timber piece, 1/2" deep x 1-1/4" wide.

1. Raise the table so that the blade protrudes through the required 1/2".
2. Mark the 1-1/4" wide cut-out section on the face that will enter the cut (the face nearest the blade).
3. With the mitre quadrant set square, cut the two extremes of the 1-1/4" section, taking care to just leave the lines on the work piece.
4. With successive cuts the waste can either be cut right out or cut sufficiently to make it an easy matter to remove what waste may still remain with a wide chisel.

### NOTE

It should also be mentioned here that angle dadoes (such as are frequently used for holding the steps in ladders and the like) can be cut in the same manner if the mitre quadrant is simply set around to the required angle.

Should large numbers of dadoes have to be cut it is possible to fit a suitable Dado Head in place of the saw blade. Such a set-up would require a special table insert and removal of the normal Under Saw Guard No. 81 during the cutting operation so as to enable the large quantity of shavings produced to escape easily.

The cutting of grooves along the entire length (or a proportion thereof) of a timber piece is achieved by first removing the splitter (refer to Operating Adjustments Section) then raising the table to expose the saw blade the correct amount, then by moving the guide fence just enough after each cut so that the waste is removed. Continue this fence movement until the desired groove width is obtained. This grooving set-up can be very tedious when a considerable amount of timber is required to be grooved. For an easy and extremely quick way of grooving see the "Pacemaker" Wobble Saw Attachment (Refer to Attachments Section.)

### COVE CUTTING (Fig. 1)

This is the operation of cutting a radius in the length of a timber piece such as that seen on "Scotia" section and the owner will find that with a little practice he can produce quite large radius cuts on the "Pacemaker" saw. In operation the Fence Pivot Lock is released and the fence is set at an angle across the saw table. The saw table is raised so that only 1/8" approx. of the saw teeth is exposed above the table and the workpiece is held down on the table and against the fence while being slowly fed over the saw blade.

After the first pass is completed the table is lowered approx. 1/8" and the operation is repeated like this until the desired size of cut is obtained. To produce the different radii the angle of the fence is varied and a test piece should be machined first so as to arrive at the correct setting for the job in hand.

It is a good plan to make the finish cut very light, approx. 1/32", as this ensures a good finish to your cove job.

For very large radii it is necessary to screw a wooden packing block to the fence face so as to allow the fence to be swung to the extreme angle required without making the distance between the blade and fence unworkable for anything other than a very wide work piece.

### WIDE SHEET SAWING

The ripping down of large sheet such as ply, masonite etc., is carried out on the "Pacemaker" by first marking out the sheet and then cutting free hand by following the marked lines by eye as the material is fed through the saw. For sheet sawing a fine toothed saw as described under "Types of Saw Blades", should be used.

### NOTE

The automatic saw guard fitted to the UP10-600 "Pacemaker" does not have to be removed for a wide sheet sawing operation, however the "Hood" type guard as fitted to the SP12-600 models does have to be removed (refer Operating Adjustments Section). If a lot of wide sheet sawing is contemplated on a machine having a "Hood" type guard we recommend the fitting of a 10" diameter saw blade and the Automatic Guard Cat No. UP/Z/7 (See Accessories Section).

### TROUBLE SHOOTING

Saw binding under normal working conditions may be traced to one or more of the following faults:—

1. Saw blade needs sharpening.
2. Belt slipping.
3. Motor may not be receiving the correct electrical voltage for which it was designed. This can be caused by the use of an extension cord of either too small a capacity or too long in length to pass the necessary current. Also in some areas the correct voltage is not always available, especially at a time when there is a heavy call on the available power supply.
4. Fence out of alignment with blade.
5. Splitter out of alignment with blade.
6. Heavy cutting being attempted with the fence fully extended.

### CORRECTION PROCEDURE

1. Sharpen saw blade.
2. Tighten belt (refer to Maintenance Adjustments Section).
3. Use a shorter extension lead of larger capacity. Have the voltage tested by the electrical supply people who will advise the steps to be taken to correct this fault.
4. Adjust the fence fault by loosening the Fence Pivot Lock (Fig. 1. 6.) and swing the fence slightly in the required direction.
5. This error in the splitter alignment can be adjusted (refer to Maintenance Adjustments Section).
6. Withdraw fence back by loosening the two Fence Slide Locking Screws (Fig. 1. 6.) so its end does not extend more than 3" past the gullet of the saw teeth.

Binding of the saw blade is seldom caused by the blade being out of true, but is usually associated with the above faults. If fault No. 4 is present the operator will notice that both faces of the previously cut work piece are comparatively smooth until they reach the rear of the saw blade, then one surface takes on a rough and jagged appearance. This fence fault if not corrected early, can soon blunt the saw teeth on that side, resulting in the cut persisting to deviate from the desired cut line.

## WARNING

Do not attempt any adjustment with machine spindle in motion as this practice is highly dangerous and totally unnecessary. Also it is a good plan to always rotate the spindle by hand prior to switching on after having made any adjustment or set-up. This ensures that nothing is going to foul the machine and serious damage will thus be avoided.

## THE "PACEMAKER PLANER"

### PLANER

This machine is known under several names — Buzzer, Jointer, Surfacer or Planer. So as to avoid confusion, it will be referred to as a "Planer" throughout this article. The uses of the Planer are many and varied, as the following operations will show.

### NORMAL PLANING (Fig. 1)

This is carried out on the planer by firstly having the back table surface perfectly level with the uppermost cutting line of the revolving blades then by means of the Rise and Fall Knob lowering the front table to the desired depth of cut.

On narrow edges (less than 1") this can be up to 1/4", but wider than 1", the cut should be kept down to 1/16" or less. Remember it's far better to take two light cuts (1/16" or less) than one heavy cut (1/8" or more). The finish will be much finer and the operator will have no trouble holding the work piece against a light cut as described.

Hold the work piece down firmly on the front table, while at the same time moving it slowly forward toward the cutting blades. Keep a firm grip on the work with your right hand and exert a downward pressure with your left. After the work has passed on to the back table to the extent of about 6", move your left hand from its position on the front table and exert a downward pressure on the work piece, which is now resting on the back table. A little practice will reward in this operation, because to plane successfully the downward pressure and feed movement need to be uniform throughout the entire time the work piece is in contact with the cutting blades.

Practice this method of pressure and feed movement (you can do this with the "Pacemaker" switched off, if you raise the front table to the level of the back table so that the cutting blades do not interfere with the practice piece being passed over). After you have mastered these movements and pressures, try always never to allow your hand or fingers to pass over the blades. Practice moving your hand to the back table before it reaches the cutting blades.

When planing timber wider than approx. 1-1/2" the adjoining saw table edge can be used as a guide rather than using the guide fence which can be left set for use on the saw side.

### PLANING AND SQUARING ON EDGE (Fig. 1)

This operation is usually carried out after the wide surfaces of the timber have been planed. The guide fence will be used to keep the work piece at right angles to the cutting blades. Unlike sawing operations where the guide fence length is varied, planing operations are always carried out with the guide fence fully extended. Check that the fence is set at zero on the Fence Tilt Scale then lower the front planer table to the desired depth of cut. Up to 1/4" deep cut can be managed on edge planing such as this, providing the edge being planed does not exceed approx. 1" in width, but keep in mind that the lighter the cut the better the finish on all planing operations.

If it is necessary to use the guide fence to square a large piece of timber, say 6" x 6", the fence can be positioned so that it rests on the adjoining saw table and allows a full 6" wide squaring cut to be carried out. To do this proceed as follows:—

1. Lower saw table to its lowest position.
2. Loosen the Fence Tilt Handle and lift the fence approx. 3/4" in its locating slot, relock the handle with the Fence Tilt Scale reading zero. Position the fence assembly on the Planer Fence Bar so that the fence face is just proud of the adjoining saw table and lock the Fence Lock Handle.
3. Now loosen the Fence Tilt Handle and allow the fence to rest on the surface of the saw table, relock handle with Fence Tilt Scale reading zero.

## WARNING

When this type of squaring operation has been carried out, do not attempt to raise the saw table without first removing the fence assembly, otherwise serious damage could occur.

### BEVEL PLANING

To perform bevel planing tilt the guide fence to the required angle (see Operating Adjustments Section) and the operation is carried out in the same manner as edge planing. The guide fence on your "Pacemaker" is made to tilt to the left for this type of planing work. By tilting it to the left a wedge shaped guide area is offered to you, which makes the holding of the work extremely

simple, where as if the guide fence is tilted to the right, while it will still produce a bevel cut, the work piece is much more difficult to hold with the fence in this position.

### REBATING OR RABBETTING (Fig. 1)

To perform this operation proceed as follows:—

1. Remove planer guard.
2. Position the guide fence on the planer table to the desired measurement of the rebate width by referring to the graduated scale attached to the top of the Planer Fence Bar. Make sure the back guard on the guide fence is in its horizontal position so that the cutting blades are covered behind the fence.
3. Lower the front table to the required depth. It is permissible to cut up to 1/2" deep in one pass providing the width of cut does not exceed approx. 2" in softwood or 1" in hardwood.
4. Where the inherent "spring" in the Guide Fence causes unacceptable variations in the rebate width we recommend that the end of the fence be supported by the Fence Back Guard (see Operating Adjustments Section).

### BLIND REBATING (Fig. 13)

This type of rebating is referred to as "Blind" because the rebate does not run right through the entire length of the work piece, but starts some distance in from the leading edge and finishes before the trailing edge of the work piece is reached.



Figure 13

To perform this operation on the "Pacemaker" planer, lower the front table to the depth of cut required, then, using a "straight edge", off the front table, lower the back table (by means provided under back table) until its surface is in line with the surface of the front planer table.

Set the guide fence in a suitable position, and, after marking the work piece to show where the cut is to start and finish, hold the work piece against the guide fence, with the starting mark directly over the blades. Then carefully lower the back end of the work piece down on to the back table; now pass the work piece over the blades as in normal planing until the finish mark is reached and the operation is completed.

## NOTE

This operation is performed much easier if successive light cuts are taken rather than a single heavy one.

## IMPORTANT

Re-adjust rear planer table, to cutting line of blades, before attempting any other type of planing operation.

## TROUBLE SHOOTING

1. Planer "feels" rough when work is passing over blades.
2. Work seems to "bump" just after its leading edge passes over the blades and the cut gets progressively lighter as the work piece is advanced over the blades.
3. A "ridge" is left on the right hand side of the surface being planed.
4. Bad finish on work even though blades are sharp.
5. "Lines" extending the full length of the planed surface.
6. Planer produces an edge that is either "hollow" or "round" in its length.
7. A rebate varies in width, gets progressively narrow in the length of the work.
8. The work piece is hard to hold against the cutting action of the blades and the finish shows signs of bad "chatter".

## CORRECTION PROCEDURE

1. Back planer table is below the level of the cutting blades. Adjust table as necessary. Blades need sharpening. Blades are not adjusted evenly.
2. Back planer table is above the cutting line of the blades. Adjust rear table as necessary.
3. Move one blade only in toward the saw table; reset its outer cutting diameter to match that of the other two blades (Fig. 7).
4. Some timber does not plane well — are you planing against the grain? Blades may not all be adjusted to same cutting level. Check and adjust.
5. Blades are "gapped" remove and have them re-ground.
6. Table surfaces may be out of alignment (check with a "straight edge" and adjust if necessary) (See Maintenance Adjustments Section.) If table alignment is not at fault, then you are not keeping the work piece down on both planer tables during the entire planing operation.



- The end of at least one blade must be proud of the side of the rear planer table. Check and adjust one blade as necessary (Fig. 7).
- The cut is too heavy — lighten it. If fault is still present refer to No. 1 procedure in this paragraph.

### THE "PACEMAKER" MOULDER (Fig. B)

The "Pacemaker" moulder is of the horizontal twin cutter type. This allows a wide variety of shapes to be produced without any special skill on the part of the operator, the work being passed over the cutters in a similar manner to a planing operation. The Moulder Collet Spindle No. 173 together with the Moulder Collar No. 172 are slotted to receive any shape of blades to produce an immeasurable number of mould styles.

### MOULDING PROCEDURE (Fig. 1, B)

- Remove Planer Guard.
- Loosen holding bolts No. 161 under Moulding Table No. 155 and withdraw each table away from the spindle, lock the holding bolts to keep the tables firm in this opened out position.
- Position the Moulding Collar No. 172 on the Moulder Collet Spindle No. 173 with its concave surface outward and then screw on the Moulder Nut No. 171 (left hand thread) so that its convex face engages with the concave face of the Moulder Collar No. 172.
- Insert blades in the collar slots. Use only blades of a uniform width and an accurate 1/4" thick.
- Set the blades to the required cutting circle. This should be kept as small as possible, while at the same time allowing the required depth of cut to be obtained. A little care here will pay dividends, especially if both cutters are of the same shape because if only one cutter is in contact with the work, the finish obtained will not be up to the standard of that which would result from correctly set cutters.
- Using a 1/2" whit. spanner tighten the Moulder Nut No. 171 (left hand thread) firmly by using the Spindle Holding Bar No. 191 inserted in one of the planer cutter head slots. (See Operating Adjustments Section).
- Wind the front planer table upwards until the moulder tables are positioned to give the desired depth of cut.
- Adjust both moulder tables towards the spindle so that when the spindle is rotated by hand the previously set cutters will clear the tables by approx. 1/8". Retighten the holding bolts under the tables.
- Lock the Moulder Lock Handle.
- Position the guide fence on the moulding tables so as to produce the width of mould required.
- Adjust the saw table height so that when the Guide Fence Back Guard is extended it bears against the side of the saw table and supports the end of the fence against the side pressure applied during the moulding operation. (See Operating Adjustments Section.)

Where the shape of the mould necessitates that part of the blades will pass under the guide fence and it is found that the cutout section on the underside of the fence is not large enough a wooden facing piece approx. 3/4" thick should be made up and attached to the guide fence face by the threads provided in the fence. This facing piece can then have a semi circular opening cut out of its lower edge to allow the necessary clearance for the cutters when required.

### CUTTING THE MOULD

This is carried out in a very similar manner to operating the planer as previously described, the method of holding the work and feeding over the blades being even with a good "downward and toward" the fence pressure being applied right throughout the cutting operation.

The feed should be no faster than that which the cutters will comfortably allow, and where this is very slow the operator should consider the taking of two cuts in place of the one heavy pass over the blades.

To do this it will, of course, be necessary to raise the tables for the first cut and then lower them again to finish the cutting operation. Remember, you must release the Moulder Lock Handle before attempting any adjustment to table height.

### CAUTION

As previously stressed in this instruction manual, the taking of heavy cuts, especially on short hard-to-hold work pieces, should be avoided wherever possible. Where there is no other way out but to resort to heavy cutting, then the following hints will assist:—

- Do not attempt to use anything but first quality timber, free from knots, and splits.
- Keep the work pieces long enough to give you a good grip over them. Where the finished pieces are to be, say 12" long, then make them in pairs and dock them to length on the saw after the moulding is completed.

- Where the finished moulded work piece is of a flimsy nature, such as quarter round, scotia, etc. it is a good plan to carry out the moulding cut while the work pieces are double or more the finished size in width, after the mould has been made, cut the scotia, etc., off to the required width on the saw.

### CUTTER DESIGN (Fig. 14)

As is now obvious to the operator, the "Pacemaker" moulder utilises two cutters to perform the cutting operation which means that where a shape required is such that it would be extremely difficult and costly to obtain blades each having the intricate shape required on their cutting ends, these shapes can, however, be obtained simply by dividing the required shape at the most convenient place and then grinding one blade to produce this half shape, the other blade being ground to overlap this join position and to continue on around the remaining half of the completed shape required. In practice, with the blades set correctly in the moulding collars, it can readily be seen how one blade produces a portion of the shape while the second blade completes the mould.

This method of cutter design does away with very costly single shape cutters, while at the same time making it possible for the operator to grind his own blades, even though the shape produced appears most intricate on the finished pieces.

### MOULDING CUTTERS

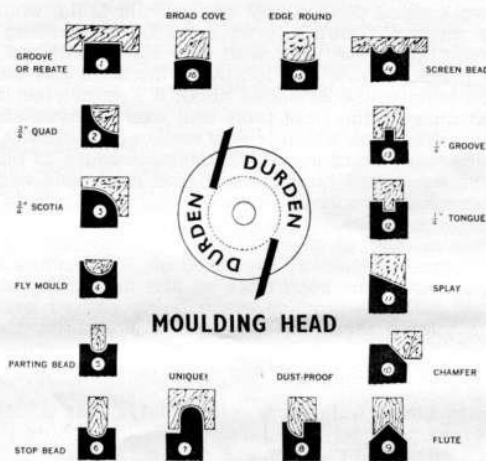


Figure 14

A Standard range of DURDEN moulding knives are available. These knives are in pairs and range from No. 1 to No. 16 and in this range is included most of the shapes in everyday use.

### ANGLE MOULDING

This is carried out with the guide fence tilted either to the left or right, whichever is the most convenient for the job in hand. The operation is performed in the same manner as the moulding already described. This method of moulding is extremely useful where it is necessary to let ply or the like into a rail at an angle other than 90 degrees.

### GROOVING

The moulder is extremely adaptable to this operation, and with cutters ground to the required groove width, the operator will find that, providing the moulding procedure as previously explained is adhered to, finished grooves can easily be produced. The necessity to have a range of grooving cutters can be overcome by the use of the UP/Z/4 Wobble Saw. This ingenious saw is used on the moulder in the same manner as ordinary cutters are used, but its width of cut can be varied infinitely within its capacities. (See Attachments Section.)

### REBATING (Fig. B)

While this operation is usually carried out on the planer, the moulder has the advantage of being able to produce rebates larger than that which the planer's capacities will allow. Rebating on the moulder is carried out the same as normal moulding procedure, the cutters being set equally, etc., and the guide fence used to effect the width of rebate required.

### NOTE

If it becomes necessary before a moulding operation is completed (through the spoiling of a work piece etc.) to use the saw and planer, the Moulder Collet Spindle No. 173 complete with the set up knives, can be removed from the machine and replaced when required. (See Removal and Refitting of Moulder Collet Spindle in the Operating Adjustments Section.)

## THE "PACEMAKER" ATTACHMENTS SECTION

### THE BORER-SANDER CAT. NO. UP/Z/1 (Figs. 15, 16, 17, B)

This very useful attachment allows the "Pacemaker" to perform the following operations.

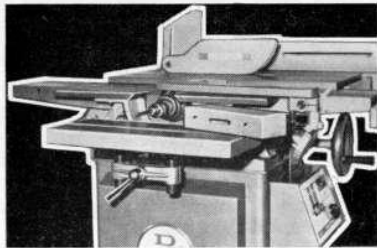


Figure 15

1. Boring or dowelling — using spiral fluted dowel drills ranging in size from 3/16" to 3/4" diameter and all having a 1/2" dia. parallel shank to suit the moulder collet spindle No. 173.



Figure 16

2. Mortising — using straight fluted mortise drills. These drills have their edges relieved along the entire cutting length to facilitate the cutting action when the work piece is moved sideways to produce the slot known as the mortise. Like dowel drills mortise drills are available with a standard 1/2" shank to suit the Moulder Collet Spindle No. 173 and their diameter also ranges from 3/16" to 3/4".
3. All types of disc sanding using an 8" dia. alluminium disc with a replaceable glued on abrasive paper.

**ADJUSTMENTS:** Should it be necessary to re-align the Borer-Sander Table so as to bring its mitre track into true parallel with the Saw Table mitre track proceed as follows. Loosen the two 5/16" hexagon head set screws that hold the support bracket to the underside of the Borer-Sander Table and after moving the table the desired amount retighten the two set screws. The Borer-Sander Table is fitted with a 90° position stop in the form of an eye bolt which can be swung out of action when an angle other than 90° is required. If the 90° position of the table requires any correction, rotate the self locking nut on the shank of the eye bolt.

#### BORING AND MORTISING (Fig. B)

1. Fit the Borer-Sander attachment into position by bolting it to the underside of the moulder Bracket No. 156 by means of the locating dowels and bolts provided.
2. Release the Lock handle and lower the table in its supporting bracket to its lowest position.
3. Using the Collet Nut No. 170 only on the Moulder Collet Spindle No. 173 insert the appropriate drill into the 1/2" receiver hole and using the Spindle Holding Bar No. 191 (refer Operating Adjustments Section) tighten the Collet Nut No. 170 (left hand thread). Avoid over tensioning, it is not necessary.

#### NOTE

- Care should be taken here to see that approximately 1/8" of the 1/2" shank of the drill is still visible outside the collet nut. If this 1/2" shank is inserted too far into the collet chuck and the collet nut is tightened, the result may well be that the collet nut will squeeze the spindle end over the shank of the drill, thus preventing the drill from being removed, apart from damaging the spindle in the process.
4. Raise the table to the approximate position required and tighten the lock handle. Now using the front planer Rise and Fall Knob No. 114 finely adjust the table to the desired setting in relation to the drill and lastly tension the Moulder Lock Handle.
  5. Mark all the work pieces to designate a face that will always be kept downwards on to the table throughout the boring or mortising operation. It is essential to do this, otherwise any variation in work thickness could cause the mortises, etc., to be out of line with each other on the one work piece. In the case of mortising it is usual to mark the position and length of the slot required, both on the face where the drill will enter and also on the face where the drill is to show through.

6. For dowel hole drilling a wooden stop should be clamped to the table, this stop to be parallel to the drill bit and the correct distance from it to produce the hole in the right position on the work piece. This stop is left set until all the work pieces have had this first hole drilled, the stop then being re-set prior to a second hole being drilled in the same work pieces.
7. Mortising is carried out in a very similar manner to boring, with the exception that the mortise positions are usually marked out as previously explained, and the squaring stop is not used.

To cut a mortise, first drill a hole at each end of the mortise position, these holes need only be drilled a little over half way through the work piece. As much as possible of the waste between these two end holes is next removed by drilling a row of holes as close as possible to each other. The work piece is then fed on to the mortise drill to a depth of 1/8" approximately and the cutting of the mortise is accomplished by moving the work piece sideways while at the same time advancing it into the drill bit. This traversing movement between the two end holes is continued until the depth of these holes is reached, the work piece then being reversed and the same procedure repeated for the opposite face so as to produce the mortise through the full width of the work piece.

When performing this sideways movement do not allow the work piece to lift off the table. This can be prevented to a large extent by only feeding into the drill bit when the work piece is moved to the right. If the feeding in is done when the work piece is moving to the left there is a definite tendency for the work to try and lift off the table, this lifting, of course, can only result in an inaccurate mortise.

On most timbers the feeding, prior to the sideways movement, should be kept down to approximately 1/8", as this makes for a much cleaner mortise and the operator will have little trouble controlling the sideways cutting.

Remember, keep the same face of the work piece down on the table when it is reversed around to complete the mortise, otherwise any error in your table height setting will become very apparent.

By cutting the mortise from each side of the work piece as explained, you avoid the possibility of damaging the mortise edges.

#### IMPORTANT

Never attempt to use the collet chuck to hold any drill shank other than the standard 1/2" diameter for which it was made, and under no circumstances should any tightening of the collet nut be attempted while the chuck is empty.

#### DISC SANDING (Figs. 17, B)

1. Fit the Borer-Sander unit to the "Pacemaker" as shown in (Fig. 17).

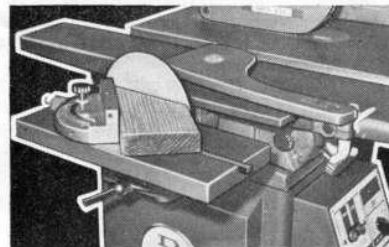


Figure 17

2. Release the Borer Sander lock handle and lift the table clear of the machine. Place the moulder collar No. 172 on the Moulder Collet Spindle No. 173 before screwing on the 8" Sanding Disc supplied as standard with this attachment. Do not over tighten the sanding disc, a light tension against the moulder collar is all that is necessary. Replace the Borer Sander collar and position it with its surface just above the centre of the sanding disc and secure it in this position by tensioning the lock handle. Use the front planer Rise and Fall Knob No. 114 if necessary, to bring the table to the desired position.
3. **SURFACE SANDING** — In this operation the work piece is held down on the sanding table and the face to be sanded is pressed lightly against the sanding disc, while at the same time being moved past it.
4. **END GRAIN SANDING** — Mark out the shape required on the work piece and where possible remove excess material with the circular saw. The work is then offered in the same manner as for surface sanding, it being necessary of course, to guide the work piece so as to sand down to the line of shape required. This end grain sanding is extremely useful when it is desired to round the top of a chair leg or the like, as the rounding or



shaping of end grain on timber is usually a very slow procedure when attempted any other way.

5. **MITRE SANDING** — For this type of sanding the mitre quadrant from the "Pacemaker" Saw Bench is fitted to the Borer-Sander table and the mitred work pieces are sanded in a very similar manner to that employed when cutting mitres on the saw. From this it can be readily seen that a mitre cut can be made on the saw, the mitre quadrant and work piece then being transferred to the sander table to finish sand the mitre cut at the correct angle.
6. **ANGLE OR BEVEL SANDING** — This is performed on a work piece that has previously had a bevel cut made along one of its edges, this preparatory cut would have been done firstly on the saw and then finished ready for sanding, on the planer. To sand this bevel, the Borer-Sander table is tilted to the desired angle and the operation is then carried out the same as in surface sanding. To tilt the Borer-Sander table first loosen the tilt lock bolts, these are the two 1/2" whit. hex. headed bolts situated up under the table at each end of the tilt brackets. Next release the lock handle sufficiently to allow the Borer-Sander table to sag away from the face of the sanding disc, this will give sufficient clearance to allow the table to be tilted up and the 90° stop screw disengaged from its locating hole. The lock handle can now be tightened again and the Borer-Sander table tilted down to the desired angle and held firm by retightening the two tilt lock bolts.
7. **DOUBLE ANGLE SANDING** — This can be achieved by using the mitre quadrant as in mitre sanding and also by utilising the tilting table. By setting both these angles as desired (the mitre quadrant angle and the tilting table angle), a very wide variety of double angle work pieces can be easily produced.

#### ABRASIVE DISCS AND THEIR USES

There are two main types of abrasive discs that will concern the "Pacemaker" owner. These are firstly the disc known as open coated, and secondly, that known as close coated.

The open coated disc has the advantage that it does not fill and clog up as easily as the close coated type, this makes it ideal for use on all softwoods. However the close coated disc cuts much faster and when used on hardwoods, such as Jarrah, etc., it shows little sign of clogging and cuts quicker than the open coat type. A disc having what is known as a "50" grit coat gives the best results for general work.

Use only a good quality glue to stick the abrasive disc onto the aluminium back plate, your "Pacemaker" dealer can supply you with a suitable fixing glue, one brand of which is "Bear" Disc Cement.

#### NOTE

The sanding disc manufacturers recommend that, to get maximum life from their products the operator should avoid exerting heavy pressures when sanding, it being far better to make a succession of light passes across the disc in place of one heavy cut.

Try also never to "jab" a sharp cornered work piece into the disc, as more than likely the disc will tear. Offer the corner carefully, while at the same time moving the work piece from the centre of the disc toward the outer diameter.

#### THE THICKNESSER CAT. NO. UP/Z/2 (Figs. 1, 18, B)

This is an extremely popular attachment for the "Pacemaker" as it enables the owner to produce work pieces all of uniform thickness, thus facilitating the making and matching of jointed rails and the like in furniture and cupboard work.

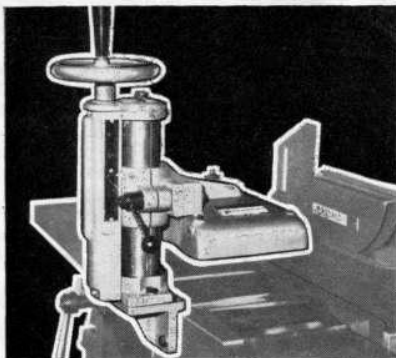


Figure 18

The following instructions should be carefully followed in the initial fitting of your Thicknesser attachment:

1. Check keenness of planer blades; they must be sharp for good thicknessing.

2. Check height of back planer table in relation to the spin diameter of the cutting blades by placing a straight-edge on the surface of the back planer table and rotate the spindle backwards; the blades should just touch the straight-edge and there should be no variation when the straight-edge is moved side-ways across the full width of the planer table. If this table setting is at fault, correct it. (Refer Maintenance Adjustments Section.)
3. Lower the front planer table, by means of the Rise and Fall Knob to the 11 m.m. position on the planer's depth of cut scale and tension the Lock Knob.
4. Remove the Moulder Bracket No. 156 by taking out the two 5/16" whit. hex. head screws that affix this part to the side of the Front Planer Table No. 125.
5. Fit the Thicknessing Attachment in the place of the Moulder Bracket using the same two holding bolts.
6. Raise the tailing out roller by means of the two knurled nuts on top of the carriage until the tailing out roller is above the level of the feed-in rollers.
7. Using a straight-edge, the sides of which must be parallel, on the back planer table and extending out over the front planer table wind the thicknesser carriage down until the feed-in rollers almost touch the straight-edge. If there is a difference in the gap between these two feed-in rollers and the straight-edge, this variation in gap should be evened up by adjusting the appropriate levelling screw (these levelling screws are located in those portions of the thicknesser base which protrude over the front planer table). The column locking handle of the Thicknesser attachment should be tensioned before carrying out any of these adjustments.
8. After this adjustment is made, test the uniformity of gap when the straight-edge is moved sideways across the back planer table. This gap should be uniform, otherwise the thicknesser will not produce accurate work. If any adjustment is necessary, proceed as follows:  
Loosen the grub screw on the side of the carriage at the end of the offending roller, adjust the grub screw directly above this, either up or down as required, and while keeping an upward pressure on the roller, relock the first-mentioned grub screw. Repeat the operation on the other roller if necessary, before carrying out both the "along the table" and "across the table" straight-edge tests again to ensure the accuracy of the adjustments just made.
9. Lower the tailing out roller, by means of the knurled nuts, until it is a little below the level of the feed-in rollers, in no case lower than 1/16".
10. Remove the Thicknesser from the machine and place the Thicknesser spring plate assembly on the front planer table in the appropriate position so that when the Thicknesser is replaced the two levelling screws referred to in para 7 pass through the two clearance holes in the spring plate assembly and hold it in position on the planer table.

#### NOTE

Once the Thicknesser Attachment has been aligned to its particular "Pacemaker" as detailed in paragraphs 1 to 9, it is then only necessary to fit it as in para 10 for all subsequent uses.

When using the thicknesser the following points should be remembered:

1. A thicknesser, when planing a surface, is largely influenced by the condition of the opposite surface (the side which is against the rollers).
2. Always offer the thickest end of the work to the thicknesser first, otherwise the work may jam before it can be passed completely through, necessitating the raising of the carriage and a resetting before the job can be offered again.
3. For normal work a very good plan is to size your work pieces to approximately 1/8" above the finished size by running them through the circular saw and then passing them through the thicknesser, removing 1/16" from all surfaces.
4. To produce work of the highest accuracy, plane one side on the planer, set the guide fence and plane an edge dead square to the planed face, the unplanned surfaces are then run through the thicknesser and the resulting job will be straight, square and parallel, if the planing operations were properly carried out.

#### THE WOBBLE SAW CAT. NO. UP/Z/4 (Figs. 19, 20)

This ingenious device allows the cutting of grooves of any width from 1/8" to 3/4" with only one pass of the work piece. It uses a system of collars, so shaped, as to allow the saw blade to assume a varying degree of "out of trueness."

This "out of trueness" can be varied infinitely, which means the operator can produce grooves to fit any thickness of ply, masonry, etc. or for grooving floor boards or the like.

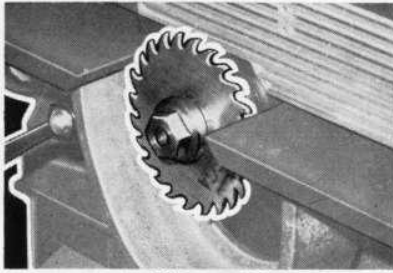


Figure 19

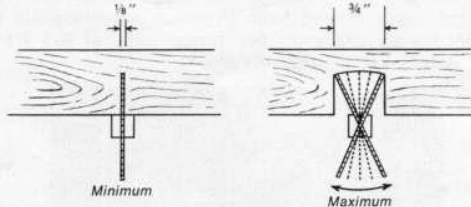


Figure 20

To fit and adjust the Wobble Saw proceed as follows:—

1. Remove the Moulder Collet Spindle from the "Pacemaker's" main spindle. (See removal of moulder collet spindle in the Operating Adjustments Section.)
2. Fit the Wobble Saw in place of the Moulder Collet Spindle (use same procedure as described for Refitting of Moulder Collet Spindle in the Operating Adjustments Section.)
3. Loosen the hexagon nut on the Wobble Saw body (left hand thread) and rotate the saw blade until the desired amount of "out of trueness" is obtained, relock the hexagon nut securely (use spindle holding bar in planer head).
4. Position the "Pacemaker" guide fence to the desired position and adjust the fence back guard so that it supports the fence (See Operating Adjustments Section.)

The procedure to follow in using the Wobble Saw is the same as that employed when moulding work is being carried out and the Moulder Lock Handle must be tensioned prior to any cutting being attempted.

A graduated reference scale is marked around the collar adjoining the saw blade, there are sixteen divisions on this scale together with a "zero" mark. When this "zero" is brought in line with the reference "zero", which is marked on the mating collar, the width of groove cut will be the same as the thickness of the saw blade (taking into account the amount the teeth are set).

If the operator rotates the saw blade until eight divisions have been moved past the "zero", the Wobble Saw will then be set to cut its maximum width, approximately 3/4". The "Pacemaker" Wobble Saw is of a fixed setting design, which means that once set to cut a certain width groove it can be removed from the "Pacemaker" any number of times without fear of the setting being lost. The depth cutting capacity of this attachment is 1-1/8".

#### THE MECHANICAL MORTISER CAT. NO. UP/Z/3 (Figs. 1, 21, 22, B)

This attachment is intended for use where larger quantities of mortised work pieces are required than would be practical to produce by the "hand" method as described under Boring and Mortising in the Borer-Sander Section. To fit the Mechanical Mortiser first remove the Moulder Bracket No. 156 by taking out the two 5/16" whit. hex. head set screws that affixes this part to the side of the Front Planer Table No. 125. Fit the Mortising Bracket in place of the Moulder Bracket using the same two holding screws. Lift the Mortising Bracket slightly prior to tightening the two screws so that its locking slot is not resting hard against the Moulder Lock Screw No. 153. Bolt the Mortising

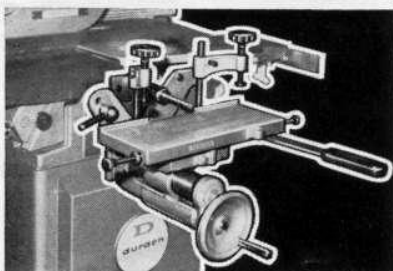


Figure 21

Attachment to the receiver pad on the Mortising bracket using the two set screws provided for this purpose.

In the initial fitting of this attachment check to see that the two jack screws protruding from the rear of the Mortising Bracket are bearing lightly against the machined surface of the adjoining Body Casting No. 93 (be sure the Moulder Lock Handle is tensioned when making this check). Should the jack screws need adjusting loosen their lock nuts and revolve the screws as required.

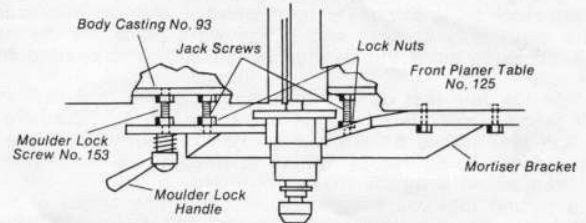


Figure 22

#### OPERATION

Clamp the work piece down on the table and back against the table ledge. The clamps have quick position stops for various heights. To vary these, pull out the locating pin, and move the clamps to the desired height.

The mortise positions should have been previously marked out on the work pieces (as described earlier in this book under Boring and Mortising) and referring to these marks set the table stops so that the mortise bit will just leave the line on when the table is traversed between stops. These table stops should be locked in position by means of the knurled lock rings provided. To set the work piece for height the whole Mortising attachment is raised (Moulder Lock Handle, fig. 1, must be in its released position) by revolving the Rise and Fall Knob. When the correct setting is obtained tension the Moulder Lock Handle before commencing work.

In operation the work is fed into the bit at each end of the traversing strokes to the extent of approximately 1/8", this movement being obtained by the hand wheel on the Mortising Attachment itself. These feeding and traversing movements are continued until the desired depth of mortise is obtained.

#### TENONING WITH THE MORTISER

To perform tenoning, remove either of the clamp bars from the table and reposition in the hole provided at the front. With the clamp in this position a work piece can be held at right angles to the table, while the remaining rear clamp can be brought to bear on the work also. The tenon to be cut should have previously been marked out and the operation is carried out much the same as for mortising, with the exception that the work is fed into the bit at one end of the table traverse only, so as to prevent the tenon edge from being broken away as it leaves the bit.

#### THE WOOD LATHE CAT. NO. UP/Z/5 (Figs. 23, 24)

This attachment is a very handy addition to your "Pacemaker" because, while not intended for any large diameter turning, it will be found very useful for the making up of round stock such as that used in kiddies' toys, chair legs, etc.

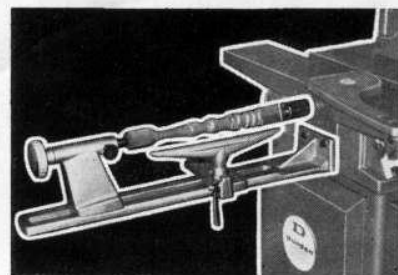
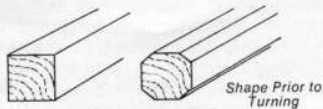


Figure 23

In operation, the work piece should first be cut to a square section on the circular saw, and it is also preferable to saw off the excess on the corners so that the work piece is roughly octagonal in shape. This makes the turning operation a lot smoother in the initial stages. Position the tail-stock in the appropriate position on the lathe bed and, having previously marked the centres on the work piece, insert it on to the driving centre in the correct position, the tail stock centre is then brought to bear on the other end of the job, again on the centre mark.





**Figure 24**

Apply sufficient pressure, via the tail-stock centre, so that the driving dogs on the head centre grip the work piece and lock the tail-stock in position. On hard wood it may be necessary to drill a small hole at each end of the work piece, on the centre mark, so as to allow the centres to get sufficient bearing in the work.

Position the tool rest on the lathe bed opposite that part of the work piece where the turning is to be carried out. The height of this tool rest should be the same, when measured from the surface of the bed, as that of the tail or head stock centres. If it is not, then adjust it by the means provided.

For a cutting tool you will need a wood-turning chisel of a suitable shape. Enquire from your "Pacemaker" dealer for this.

The shape on the work piece is produced by the movement of the cutting chisel along the tool rest, keep the chisel in an approximate horizontal position and take only light cuts. Until the operator has turned various types of wood, heavy cutting should not be attempted, as it is only certain timbers that will stand this type of cutting.

**NOTE**

A small amount of grease applied to the point of the tail-stock centre is helpful and the operator should check the tension of the tail-stock on the work to see that the job is still being held securely during the cutting operation.

**FITTING THE LATHE (Fig. B)**

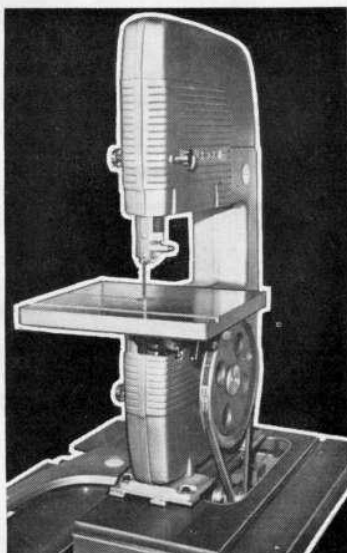
Remove the Moulder Bracket No. 156 by taking out the two 5/16" whit. hex. head set screws that affix this part to the side of the Front Planer Table No. 125. Fit the lathe to the side of the body casting No. 93, two 3/8" whit. tapped holes are provided for this and the necessary screws are supplied with the lathe. Insert the lathe driving centre into the receiver hole in the Moulder Collet Spindle No. 173 and tighten the Collet Nut No. 170. (Use Spindle Holding Bar in Planer Cutter Head.)

**NOTE**

While the lathe attachment is not recommended for any large diameter turning, the 8" Sanding Disc Part No. UPB/7 (as supplied with the Borer-Sander Attachment) can be used as a faceplate where necessary provided suitably placed work fixing holes are first drilled in it.

**THE BAND SAW CAT. NO. UP/Z/6 (Figs. 1, 25, B)**

This is in fact a separate machine in itself and to enable it to be fitted and driven at the correct speed off your "Pacemaker", we supply the Bandsaw fitted with a base plate, driving pulley and belt.



**Figure 25**

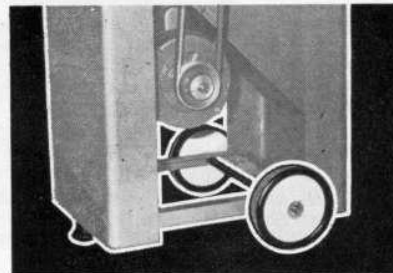
To fit the Bandsaw, remove the Insert No. 61 from the saw table together with the saw blade, saw guard and splitter. Place the bandsaw complete with base plate on the saw table with the base plate fixing studs locating in the two drilled holes in the saw table. (These are the same two holes used to hold the "Hood"

type saw guard assembly, when fitted.) Screw the nuts supplied on to the lower ends of these fixing studs and tighten. Next screw the driving pulley supplied on to the main spindle No. 192, making sure that the loose saw collar No. 204 is first placed on the spindle and with its driving pin engaged in the fixed saw collar No. 201. Lightly tighten the pulley by hand. Fit the vee belt supplied over the driver and driven pulleys and raise or lower the "Pacemaker's" saw table, by means of the Handwheel, until the belt is lightly tensioned.

For operating and adjustment procedures necessary for performing good Band Sawing work refer to the "B1200" Instruction manual supplied with each UP/Z/6 attachment.

**THE WHEEL KIT CAT. NO. UP/Z/8 (Figs. 26, C)**

Comprises two heavy duty wheels and axle together with a rubber tipped support peg. When fitted the wheel kit allows the "Pacemaker" to be easily moved from place to place on the workshop floor, simply lift by grasping the fence bars at the front of the tables and wheel the whole unit away.



**Figure 26**

To fit the Wheel Kit proceed as follows:—

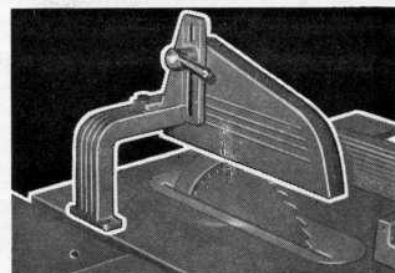
1. Remove the Base Covers No. 209 from each side of the Base No. 210.
2. With the assistance of a second person carefully tip the "Pacemaker" over backwards so as to bring the rear end of the Back Planer Table No. 124 to rest gently on the floor.
3. Position the axle through the hole in the angle iron rails in the bottom of the Base No. 210.
4. Place the wheels on the axle, after applying a few drops of oil to the wheel bearing area, taking care to see that the longest boss on the wheels goes against the angle iron rails. Fit the washers and cotter pins to the axle and spread the cotter prongs to contain the wheels.
5. Fit the rubber tipped support peg to the inside front of the Base No. 210 using the holes already in the base and for neatness place the fixing bolts so that the nuts are hidden inside the base.

**NOTE**

The wheel kit is only intended for use on concrete floors or similar and care should be taken not to let the wheels strike an obstruction while moving your "Pacemaker" as this could lead to severe damage should the unit be caused to topple over backwards. Note also it is advisable to use small wooden "chocks" against the wheels of your Pacemaker when performing heavy sawing work and more especially so when using the Thicknessing Attachment. This will prevent any unwanted movement of the machine.

**SAW GUARD "HOOD" TYPE CAT. NO. UP/Z/10 AND UP/Z/12 (Fig. 27)**

This guard, which is supplied complete with support arm and splitter is intended for use in those states where regulations require that this type of guard be fitted. We supply it as standard equipment on all UP12-600 model "Pacemakers" and it is also available for use on the UP10-600 model if required. Please quote catalogue number when ordering, i.e. UP/Z/10 for use on UP10-600 "Pacemaker" or UP/Z/12 for use on UP12-600 "Pacemaker".



**Figure 27**