Wadkin
BURSGREEN
T: 0116 2769111

24" BAND SAWING MACHINE, TYPE B.Z.B.

PRINCIPAL DIMENSIONS AND CAPACITIES.

	English	Metric
Diameter of wheels	24"	610mm
Width of wheels	$1\frac{1}{2}$"	38mm
Maximum width of saw which can be used	$1\frac{1}{4}$"	32mm
Maximum length of saw	15'5"	4,699mm
Minimum length of saw	14'10"	4,521mm
Depth of cut under saw guide	13"	330mm
Distance from saw to body	22"	559mm
Size of table	2'6" square	762mm square
Table cants	45^{o}	45^{o}
Height of table from floor level	3'2"	965mm
Horse power of motor	3	3
Speed of motor on 50 cycles supply	750 r.p.m.	750 r.p.m.
Overall height of machine	7'0"	2133mm
Floor space	3'10" x 2'8"	914mm x 813mm
Net weight	1560 lbs.	617 kilos
Shipping dimensions	66 cubic ft.	1.87 cubic metres

DETAILS INCLUDED WITH THE MACHINE

Top and bottom ball bearing guides.

Motor, starter and brake.

INSTALLATION

The machine is despatched from the Works with all bright surfaces greased to prevent rusting. This protective covering should be removed by applying a cloth damped in turpentine or paraffin.

FOUNDATION.

Foundation bolts are not supplied with the machine unless specially ordered. If the mill floor consists of 4" (102mm) solid concrete no special foundation is required. Rag type holding down bolts may be used. The outline in Fig. 1 gives details of bolt positions and clearances required. Make 4" (102mm) square holes in the concrete and place the machine in position. After careful levelling grout in with liquid cement. It is advisable to re-level the machine again after the cement has set, when the bolts should be tightened in order to prevent distortion of the main frame.

WIRING.

For detailed cabling instructions see wiring diagram on page 18.

DUST EXTRACTION.

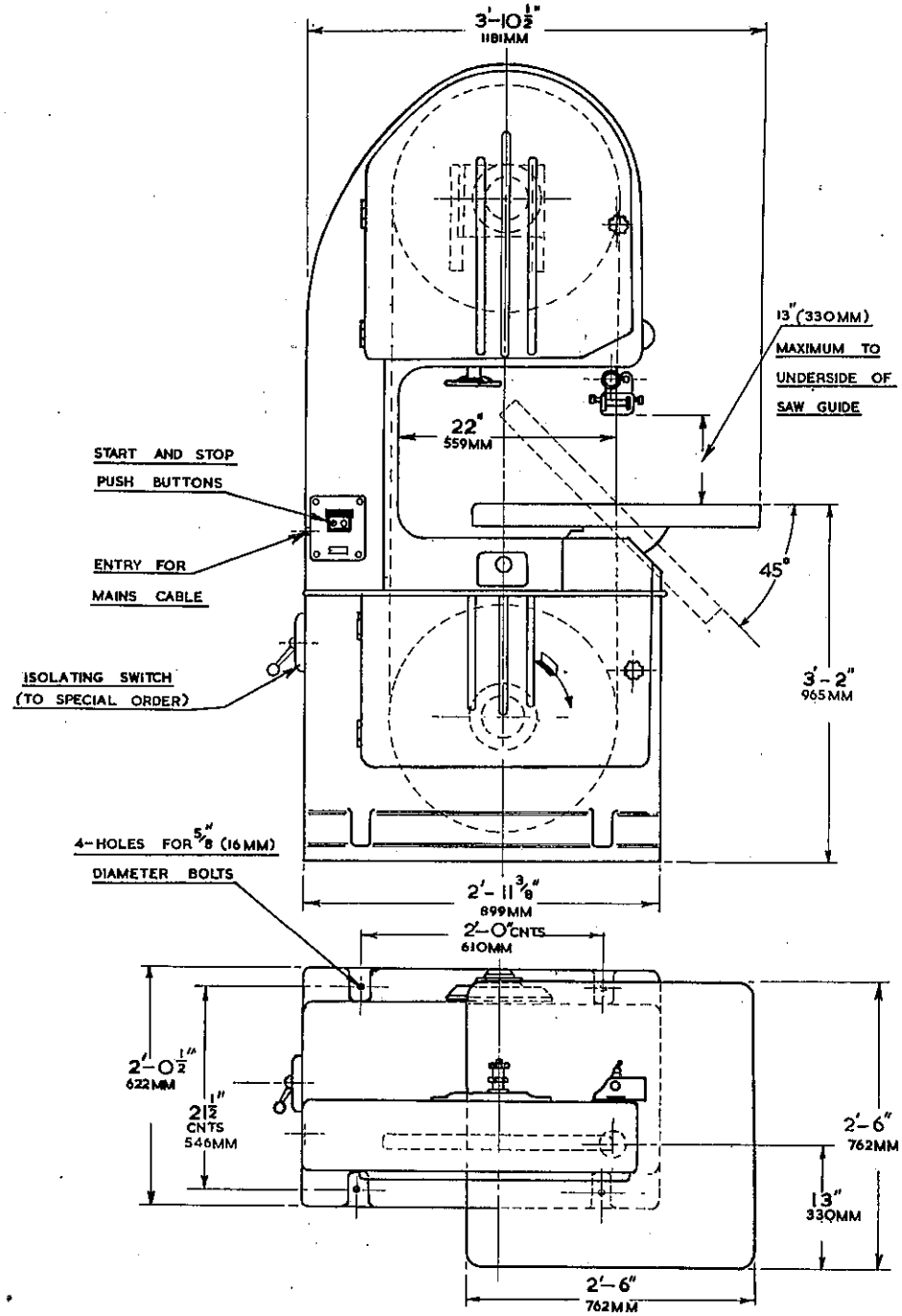
A dust chute is built into the machine base. It has a 4" (102mm) x $4\frac{3}{4}$" (114mm) rectangular exhaust outlet and can be connected to main dust extraction plant if desired.

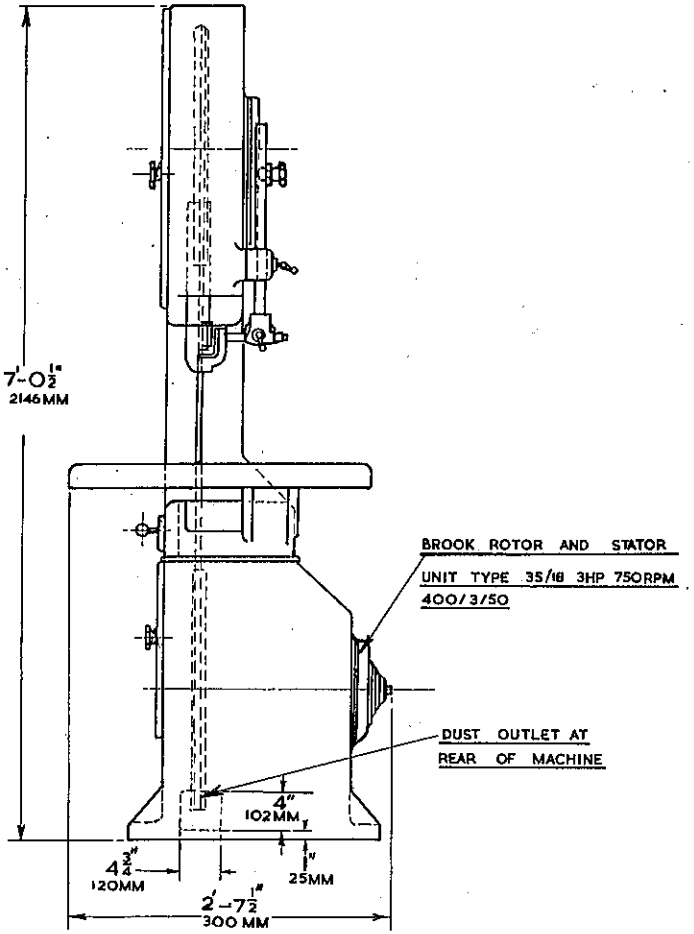
LUBRICATION

A good quality machine oil should be used for lubrication of the parts indicated in Fig. 2.
The bearings used on the top and bottom pulley spindles are sealed for life and require no lubrication.

BALL BEARING LIST

Makers' Number	Size				Number Per Machine	Where used on machine
	Bore	Outside Diameter	Width			
			Inner Ring	Outer Ring		
SKF. 5G-88506	30mm	62mm	24mm	16mm	2	Top saw pulley
SKF. 4G-88128	38. 893mm 1. 17/32"	80mm	27. 508mm	21. 031mm	2	Bottom saw pulley
SKF. 6205 - 2Z	25mm	52mm	15mm	15mm	2	Top and Bottom guide runners
SKF. 06 (Thrust race)	$\frac{3}{4}$"	1. 17/32"	$\frac{5}{8}$"	$\frac{5}{8}$"	1	Saw tensioning screw





24" BAND SAWING MACHINE
TYPE BZB.

DIMENSIONS IN FEET INCHES AND MILLIMETRES

FIG. 1.

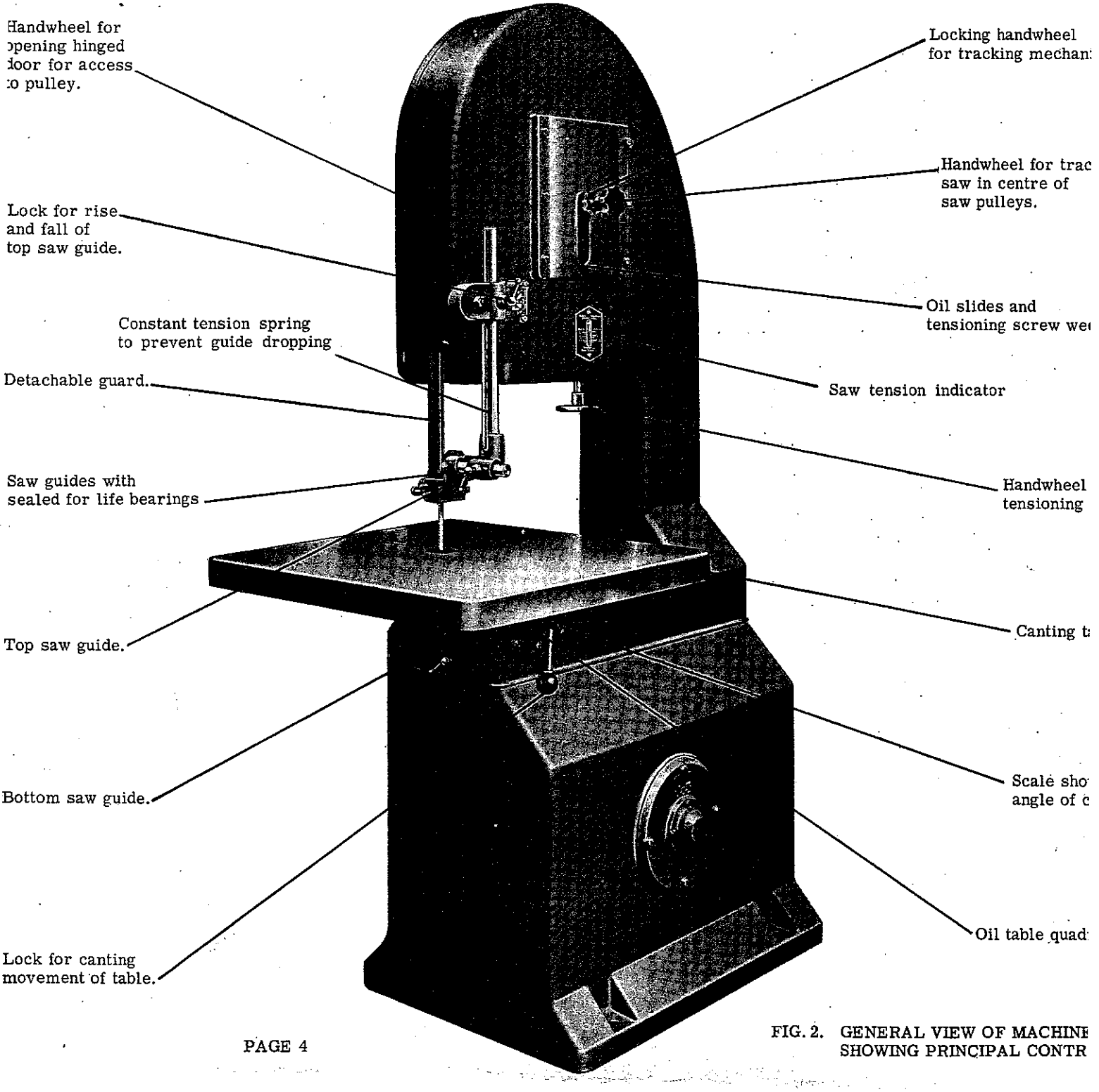


FIG. 2. GENERAL VIEW OF MACHINE SHOWING PRINCIPAL CONTR

BOTTOM PULLEY SPINDLE.

To remove bottom pulley spindle from the machine (for renewal of bearings etc.) proceed as follows :-

1. Isolate the machine electrically.
2. Remove bottom pulley by unscrewing the four nuts round the hub.
3. Unscrew locknut 'A' and remove hub 'B' and key 'C'.
4. Release four hexagon head screws and remove housing 'D' complete with spindle in direction of arrow 'E' and place assembly on a bench. Take care to support weight of rotor 'F'.
5. Remove four hexagon head screws and take off dust cap 'G'.
6. Unscrew locknut 'H' and remove rear bearing.
7. Remove front bearing.
8. If it is desired to take rotor 'F' off the spindle, first slacken the 2 - $\frac{1}{8}$" gas grub screws in collar 'J' and remove.
9. To re-assemble reverse the above procedure.

If belt driven remove belt guard, drive end locknut, pulley, dust-cap and housing at operation 4.

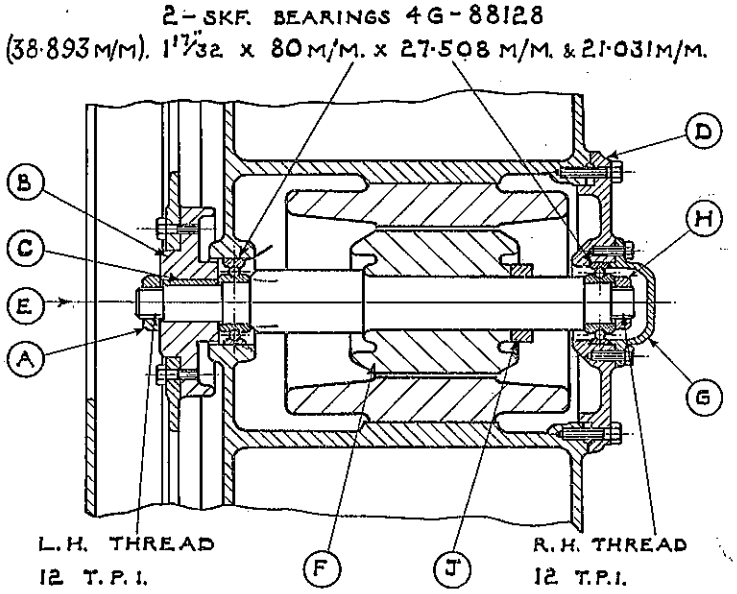


FIG.3 SECTION THROUGH BOTTOM PULLEY SPINDLE.

TOP PULLEY SPINDLE.

To remove the top pulley spindle bearings proceed as follows :-

1. Remove top wheel by unscrewing the four nuts round the hub.
2. Unscrew locknut 'K'.
3. Remove entire top wheel assembly with spindle and transfer to a bench.
4. Unscrew locknut 'N' and remove spindle by gently tapping the end with a wood block.
5. Remove circlip 'L'; then tap out bearings from each end.
6. To re-assemble reverse the above procedure, not forgetting to put back distance piece 'P' in between the bearings and replacing circlip 'M'.

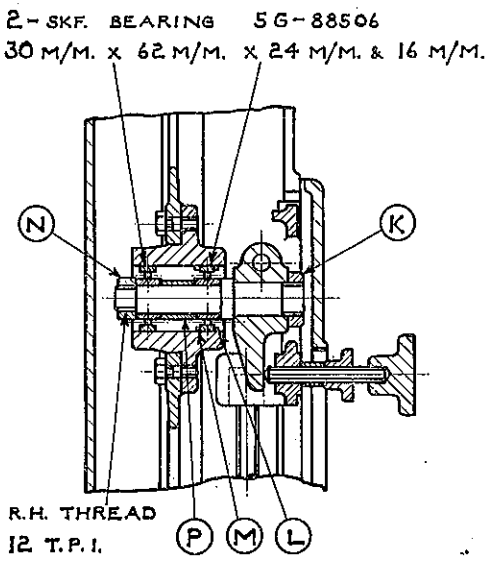


FIG. 4 SECTION THROUGH TOP PULLEY SPINDLE.

BRAKE

To operate the brake depress brake lever shown in Fig. 5. This actuates the brake rod carrying the brake shoe and forces the brake lining onto the bottom hub.
The brake should be applied only after the stop button has been pressed.

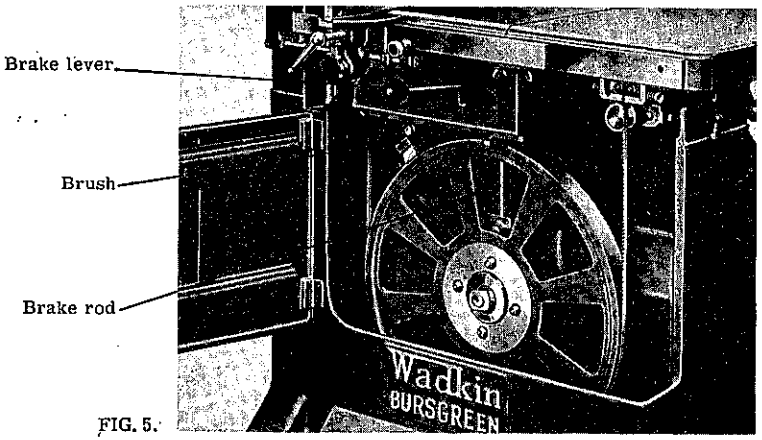


FIG. 5.

CANTING TABLE

The table canted, is illustrated in Fig. 6. It is arranged to cant up to 45° from the horizontal and can be locked securely in any position with the locking lever. The angle of the table can be observed from the pointer and degree scale provided.

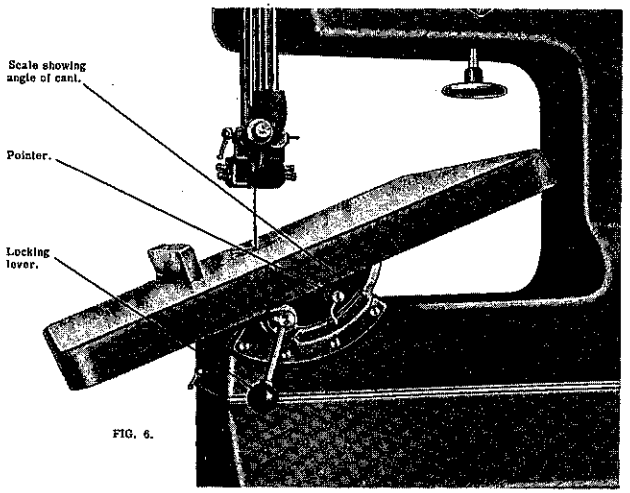


FIG. 6.

PLAIN FENCE (see Fig. 7)

(TO SPECIAL ORDER)

This fence is quickly adjustable by hand. When fine adjustment is required the small handwheel should be used. It can be fitted to work on either side of the saw.

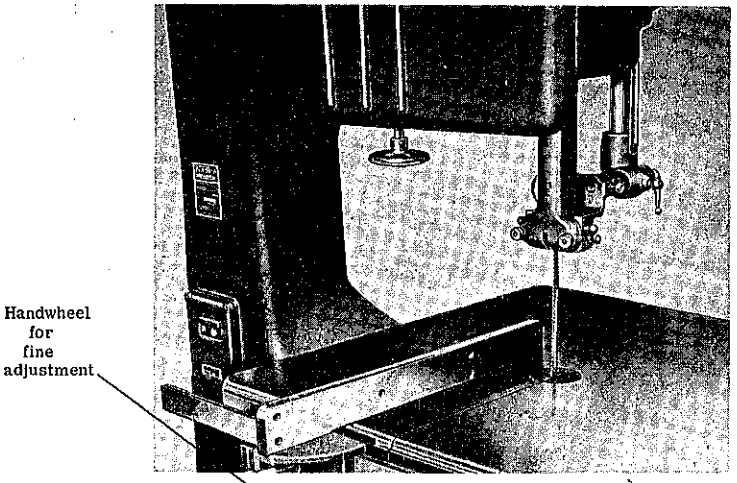


FIG. 7.

FITTING BANDSAW BLADES

TENSIONING.

The handwheel used for tensioning the saw is indicated in Fig. 2. Incorrect tension or tightness of the blade over the saw pulleys will end in saw breakage. When placing a saw on the pulleys tighten the saw until the correct tension is reached according to the tension indicator which gives the correct tension for the width of blade in use. If the machine is left standing for a time e.g. overnight, the tension should be reduced and the blade re-tensioned before putting the machine into opertion again.

SAW GUIDES - Fig. 8.

When placing a saw on the machine, the guides above and below the table must be moved well back from the saw and the saw tracked or adjusted to run in the centre of the saw pulley wheels. After the saw has been correctly tracked and tensioned, the saw guides should be brought forward until the front of the brass guide blocks are up to the saw gullets. Then adjust ball bearing runners forward until they are just clear (1/64") of the back of the saw. The brass guide blocks should support the saw on the sides but not allowed to grip the blade. When using saws of the same width they will usually run successfully without altering the adjustment, but when wider saws are used the guides must be moved back and the saw re-tracked. To obtain first class sawing, the guides must be dead in line and the top saw guide fixed immediately above the work.

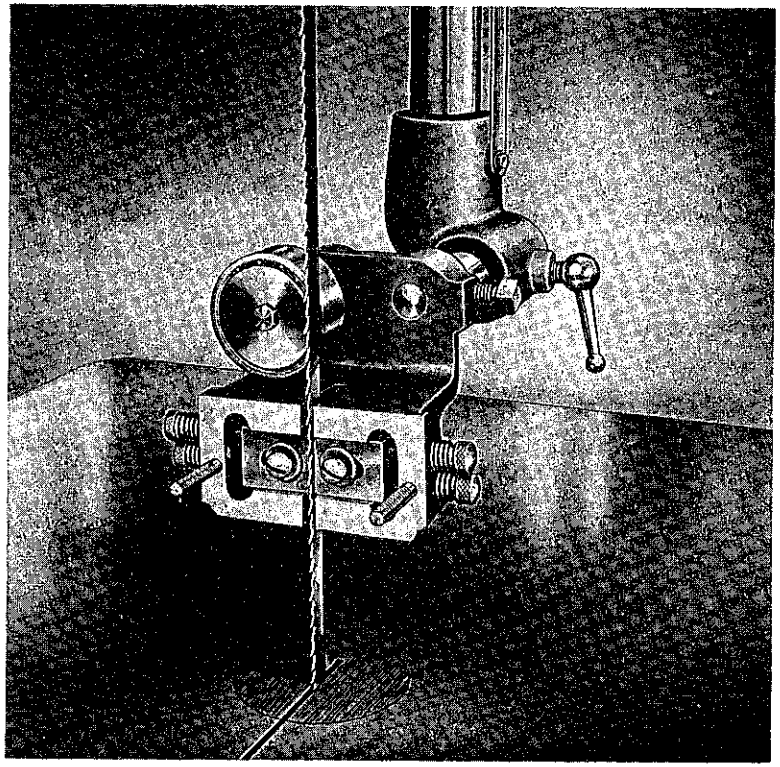


Fig. 8.

FITTING BANDSAW BLADES

TRACKING.

Every saw has slightly different running characteristics on a band saw machine due to condition of the steel ribbon it is made from, the brazed joint and the tension in the blade ribbon. This is compensated by using a crowned (or slightly curved) rubber on the wheels and providing the top wheel with a slight tilting movement. By slackening the small locking handwheel and adjusting the tracking handwheel indicated in Fig. 2 the top wheel can be tilted slightly until the saw blade runs or tracks centrally. This is important because the blade then passes in a straight line between the top and bottom wheel, and does not snake. When the latter occurs the back of the saw keeps hitting the guide runner and damaged guides result. Do not forget to re-tighten the small locking handwheel after adjusting.

SAW PULLEYS

A brush, shown in Fig. 5, is provided on the bottom pulley to remove saw dust, whilst the rubber on the top pulley should be cleared daily to prevent accumulation of saw dust which would cause the blades to run out of true line.

The saw pulleys must be kept in accurate balance to avoid vibration. It is essential that the rubbers on the faces of the pulleys are kept at an even thickness by truing up occasionally. This is done by revolving the pulley and holding against it a wooden block covered with emery cloth. Badly worn pulleys should be replaced by new ones. If the machine is used with badly worn pulleys the saw will vibrate, resulting in bad sawing and broken saws.

We have a service arrangement which we recommend whereby newly rubbered pulleys can be supplied against return of existing pulleys, an appropriate charge being made for re-rubbering only. Where it is not practical for the customer to use our exchange service of vulcanised wheels it is possible for the customer to carry out his own re-rubbering, which, whilst not so good as the vulcanised process, is satisfactory if the instructions on page 9 are carefully followed. Rubber bands and fixing solution can be supplied to order.

REMOVAL OF SAW PULLEYS.

The top and bottom pulleys are identical. To remove a pulley for re-rubbering unscrew the four nuts round the hub and remove wheel plate, leaving the hub in the machine.

FIXING INSTRUCTIONS FOR THE APPLICATION OF RUBBER BANDS TO BAND SAW PULLEYS.

The Croid Glue No. 9 supplied is ready for use and should be applied cold.

In cold weather and if the glue is solidified warm up to 80^{O} Fahrenheit to give fluidity and to assist spreading.

Thoroughly scrape and clean the face of the wheel free from old adhesive. This is very important

Stretch the rubber band over the wheel.

To assist with the application of the glue it will be found more convenient to place between the wheel rim and the rubber a piece of wood approximately $1\frac{1}{4}$" diameter. Apply the glue across the face of the wheel and turn the wood round the rim thereby exposing a section of the rim to be glued. Proceed until the whole of the wheel has been covered taking care to glue the whole face in order to obtain adhesion over the whole width to prevent the edges of the band lifting.

Tightly apply a piece of tape of the same width as the wheel around the circumference, thereby giving as much pressure as possible to the rubber band. Leave at least 24 hours before use.

Finally true up the rubber and put a slight crown on the face. This is done by revolving the wheel and holding against it a wood block covered with emery cloth, preferably when mounted on the machine. Check wheel for balance before use.

FOR TROPICAL COUNTRIES a Croid Glue No. 10 is supplied with a hardening powder which must be added in the proportion of one part of hardener to 56 parts by weight of glue and thoroughly mixed. The remainder of the procedure for cleaning and fixing is the same as in the instructions above.

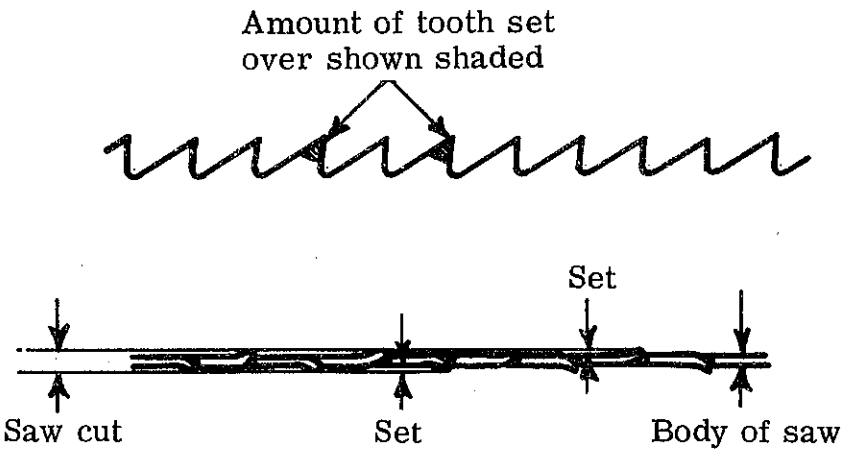
MAINTENANCE OF BAND SAW BLADES

A properly sharpened band saw will give clean, accurate cutting and this is achieved by proper setting and sharpening of the teeth. Always set before sharpening.

SETTING.

In order to cut satisfactorily band saw teeth must be set. This consists in bending the teeth alternately out of the line of the blade. This presents alternate pairs of teeth, wider than the thickness of the ribbon and prevents the ribbon rubbing in the wood being cut and getting hot.

There are two usual ways of setting bandsaw teeth depending generally upon the amount of work to be done.



(1) The use of a hand setting tool of the plier type.

(2) Machine setting. A setting attachment can be supplied to special order for fitting to the standard filing machine as shown in Fig. 12. Also recommended is the separate inexpensive setting machine as described on page 16. A feature of this machine is that the strikers which push the teeth over, are arranged on opposite sides of the blade, and strike adjacent teeth simultaneously. In this way the shock of the two strikers cancel each other out, and does not damage the body of the band ribbon.

Where hand setting is employed it cannot be ensured that all the teeth are cutting and in order to overcome this the teeth should be stoned occasionally. An ordinary fine grit stone is used and the ball bearing guide should temporarily be brought forward until the thrust disc is in contact with the back of the blade. The blade should then be run and the stone carefully applied to the teeth each side of the blade. When the saw is subsequently sharpened it will be noted that each tooth has not been marked with the stone, and such teeth should only

be filed very slightly. The remainder of the teeth which have actually been stoned should be filed in the used manner until the flat caused by the stone disappears. Bandsaws may be stoned approximately once to every six sharpenings.

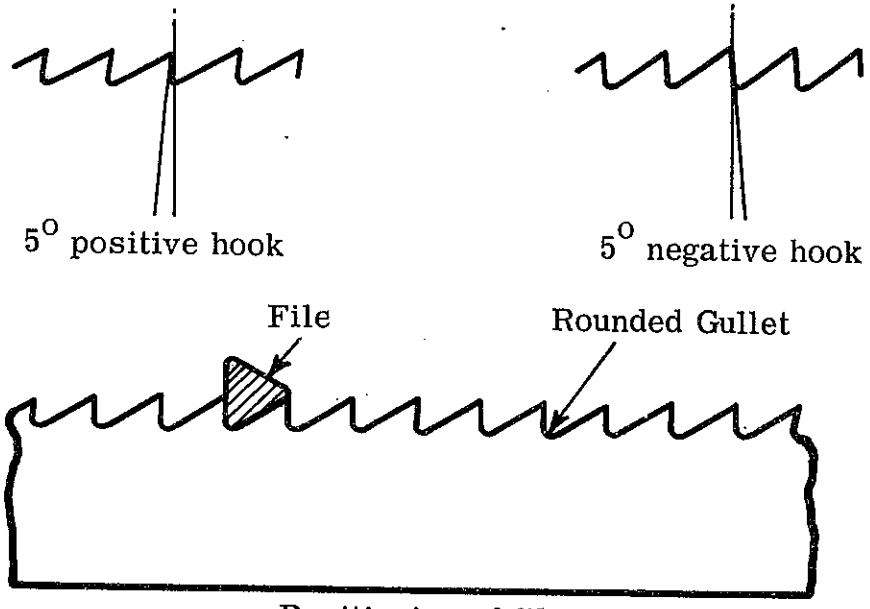
The points of the teeth are set by using a handsetting tool of the plier type. The points only of the teeth must be set and as a general guide the set on each side is .010". Set is applied in opposite directions for each alternate tooth.

SHARPENING.

This is normally done by using a triangular section file. Again the operation can be done by hand or machine.

HAND FILING.

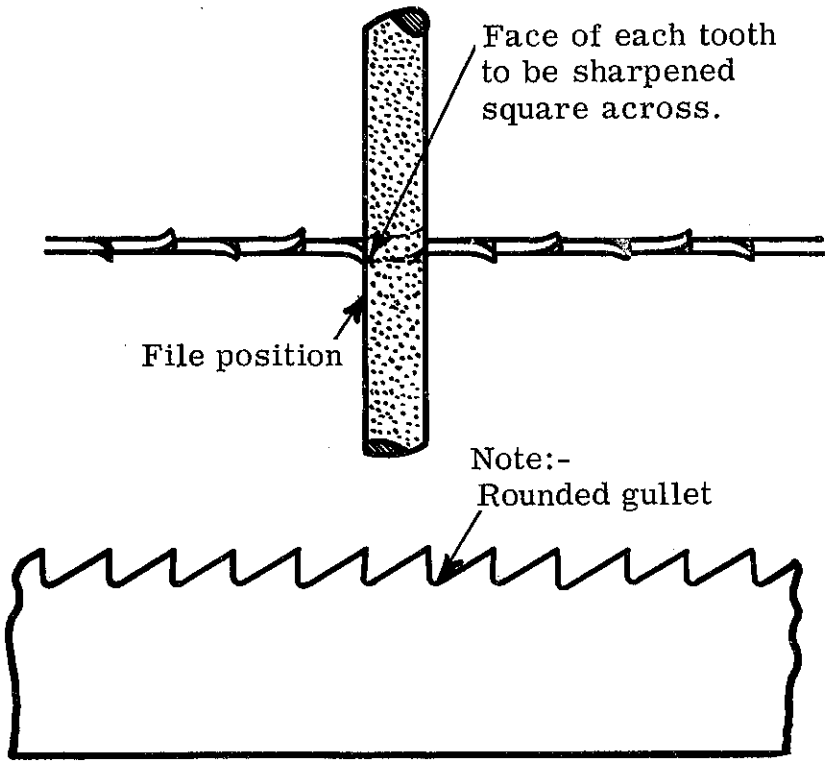
It is essential to employ an efficient and quick acting vice and round cornered triangular files, both as illustrated on page 14. The face of each tooth should be filed across and with the same stroke the back of the following tooth should be filed at the same time. One stroke of the file should be sufficient to sharpen each tooth, and this stroke should be as light as possible in order to avoid producing a burr. The shape of the gullet is automatically maintained at 60^{O} by the file, while the angle of the hook on the tooth is dependable on the positioning of the file. For general work approximately 5^{O} of positive hook should be given. A greater or smaller hook should be applied for softer or harder woods respectively. In the case of particularly hard woods a negative rake may be necessary, while a wider tooth pitch than standard may be required for sawing timbers of an abrasive nature, and those containing gum.



Positioning of file

SHARPENING (Continued)

Always sharpen square across the face of each tooth and NOT on the bevel, otherwise the saw will vibrate violently, which shatters the steel, and cracks appear causing saw breakage.
Use a file with rounded corners and of triangular section. It is important to keep the gullet of each tooth rounded otherwise cracks will soon appear. Saws must be sharpened at regular intervals and should never be forced to cut with teeth which have become blunt.



N. B.

When reconditioning bandsaw blades it is necessary to set the teeth first before sharpening. This ensures that the face of the tooth is square. If the sharpening were carried out first, the subsequent setting would result in an angular tooth shape being obtained.

MACHINE FILING.

A picture of the automatic machine for filing blades is given on page 15. Further details of this machine will be forwarded on request.

GENERAL CAUSES OF SAW TROUBLE, CRACKING AND BREAKAGE

1. Crystallisation of the ribbon, produced by the back of the saw rubbing against the metal disc of the saw guide. The disc should revolve only by contact with the back edge of the saw when actually cutting.

2. Using a blade that is too wide for the radii being cut. In attempting to cut small curves with a saw too wide the blade tends to twist against the guides causing friction and overheating which destroys the temper in the steel.

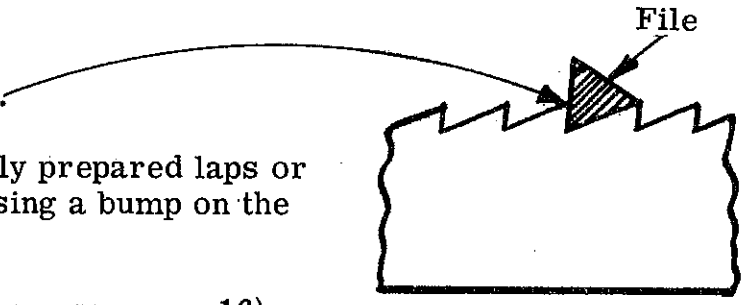
SMALLEST RADII WHICH MAY BE SAWN WITH GIVEN WIDTH OF BLADE

Width of Blade	1/8"	3/16"	$\frac{1}{4}$"	3/8"	$\frac{1}{2}$"	5/8"	$\frac{3}{4}$"	1"
Minimum Radius	1/8"	5/16"	5/8"	1. 7/16"	$2\frac{1}{2}$"	$3\frac{3}{4}$"	5. 7/16"	$7\frac{1}{4}$"

NOTE: ALWAYS USE WIDEST BLADE COMPATIBLE WITH THIS CHART.

3. Not enough set.

4. Sharpening with a sharp cornered file.



5. Bad brazing due to dirty joints or badly prepared laps or incorrect positioning of the laps, causing a bump on the back of the blade at the joint.

(For details of good brazing of a fracture see page 16).

TAPER TRIANGULAR FILES FOR HAND USE

Fig. 9

Length . . . . . 6" 8" 10"

The edges of both machine and hand files have rounded corners to produce the round gullet which prevents saw cracks.

BAND SAW FILING VICE

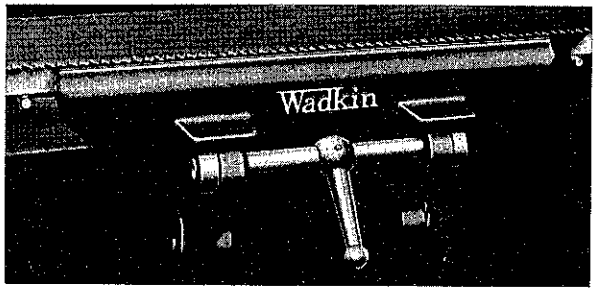


Fig. 10

A specially designed vice for holding band or fret saws also hand saws. Jaws are 17" long and will take saws up to $2\frac{1}{2}$" wide. Jaws open instantaneously by lever handle.

Spare bandsaw blades for wood cutting on the 24" B. Z. B. Bandsaw are available from stock. (Maximum and minimum lengths given on page 1). Where it is preferred bandsaw blading in strip form can be supplied for customers to make up their own blades. This bandsaw strip is offered either toothed only, or toothed, sharpened and set.

SPECIAL MATERIALS.

In addition to woodcutting we can supply bandsaw blades suitable for plastics, bonded wood, non-ferrous metals, meat, etc., providing that the correct machine speeds are available. If any special material is to be cut, a sample should be sent to Wadkin Ltd. for test purposes so that the correct type of blade may be recommended. We are able to offer special speed bandsaws for specific purposes and full details will be sent on request.

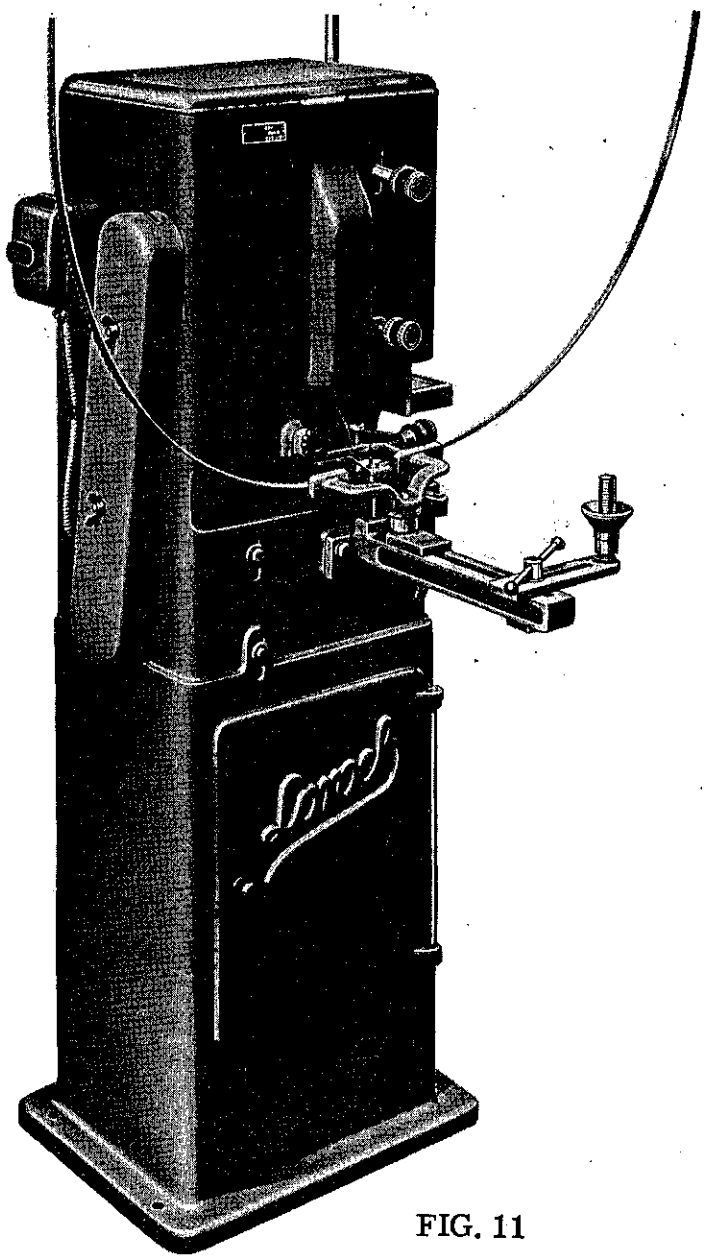


FIG. 11

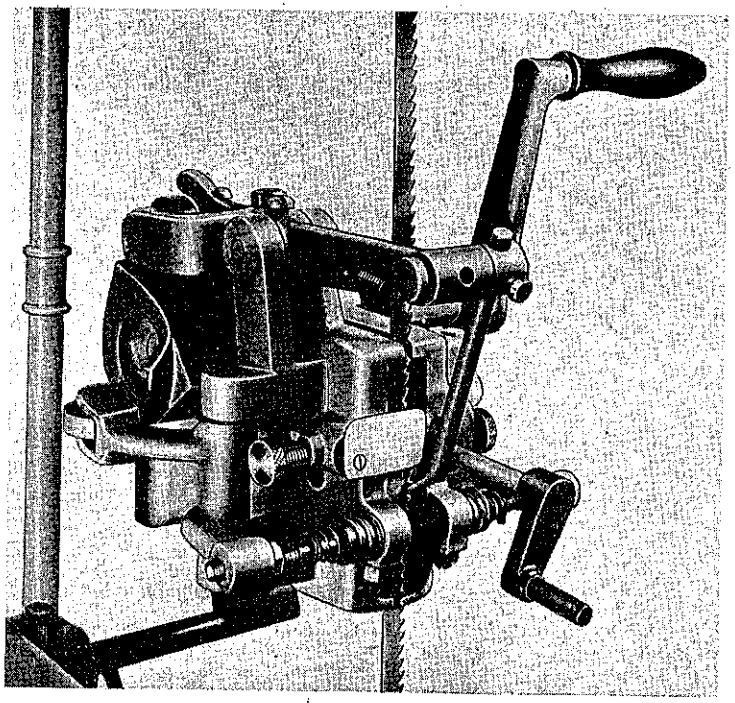


FIG. 12

This machine is fully automatic and ensures that each tooth is sharpened to the correct shape and depth.

Any length of saw can be filed, up to a maximum width of $2\frac{3}{8}$" with teeth up to 1. 3/16" pitch and $\frac{3}{4}$" deep.

A setting attachment can be supplied to special order for fitting to the machine as shown in Fig. 12. Band saws of any length up to 2" wide and $\frac{5}{8}$" pitch can be set using the attachment.

When the amount of work does not justify the installation of the equipment shown on pages 15 and 16 we can offer a prompt and efficient repair and reconditioning service. Any blades sent to us should be covered by an official order.

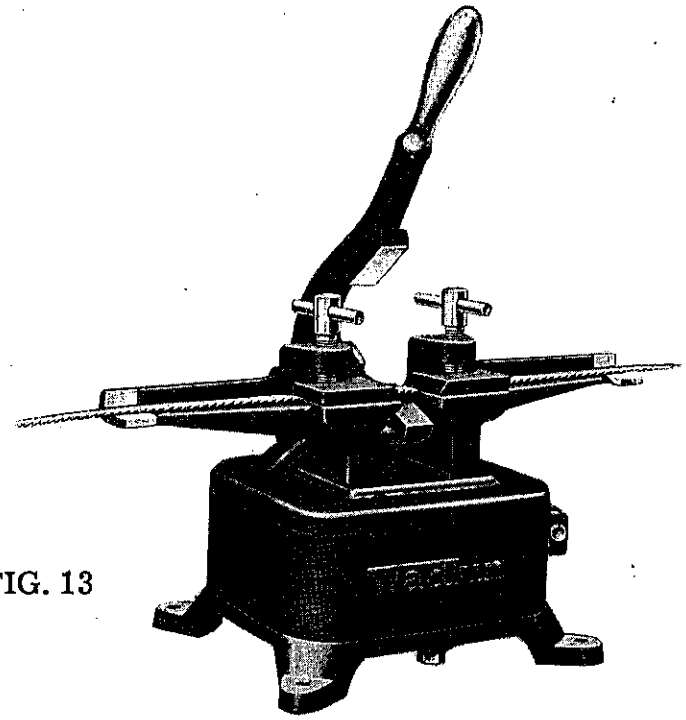


FIG. 13

WADKIN ELECTRIC BAND SAW BRAZER,
TYPE H. E.

This machine efficiently brazes bandsaws, from $\frac{1}{4}$" to 1" wide which have become broken. The two ends of the saw are firmly held by the clamps, and controlled heat applied electrically. A small quantity of solder and brazing compound are supplied with the machine. The actual brazing takes from 25 to 45 seconds according to width of blade. Before brazing the ends of the saw blade must be carefully bevelled. A separate instruction chart is issued with the brazer.

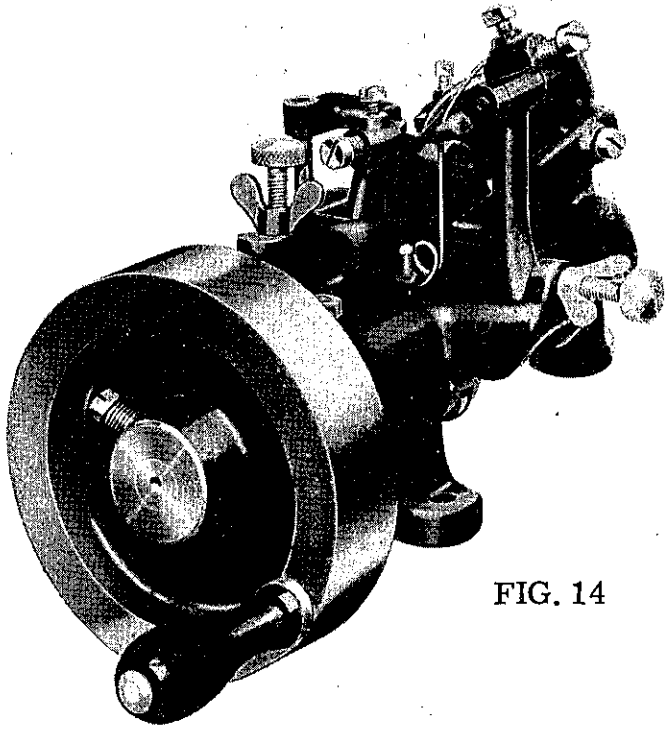


FIG. 14

WADKIN BAND SAW SETTING MACHINE,
TYPE B/SS.

FOR NARROW BAND SAWS UP TO $1\frac{1}{4}$" WIDE
$\frac{1}{2}$" PITCH.

All adjustments are quickly and easily made to this robust and thoroughly practical tool. It is usually operated by hand and setting is at the rate of two teeth per revolution of wheel. When preferred the machine may be power driven by flat belt on the pulley face of the handwheel.

ELECTRICAL INSTALLATION INSTRUCTIONS

The cabling between the motor and the control gear has been carried out by Bursgreen Ltd., and it is only necessary to bring the line leads to the machine for it to be put into service. This should be done as follows :-

(1) Fit triple pole isolating switch near the machine, unless this has been supplied to special order by Bursgreen Ltd., when it will be fitted and connected up at the machine.

(2) Connect the line lead to the appropriate terminals, see diagram. The cables should be taken to the machine in conduit and secured to the control gear by means of locknuts.

(3) Connect solidly to earth.

(4) Close isolating switch and press start button. If machine does not rotate in the correct direction, interchange any two incoming line leads.

FAILURE TO START

(1) Electric supply is not available at the machine.

(2) Fuses have blown or have not been fitted.

(3) Isolating switch has not been closed.

STOPPAGE DURING OPERATION AND FAILURE TO RESTART

(1) Fuses have blown.

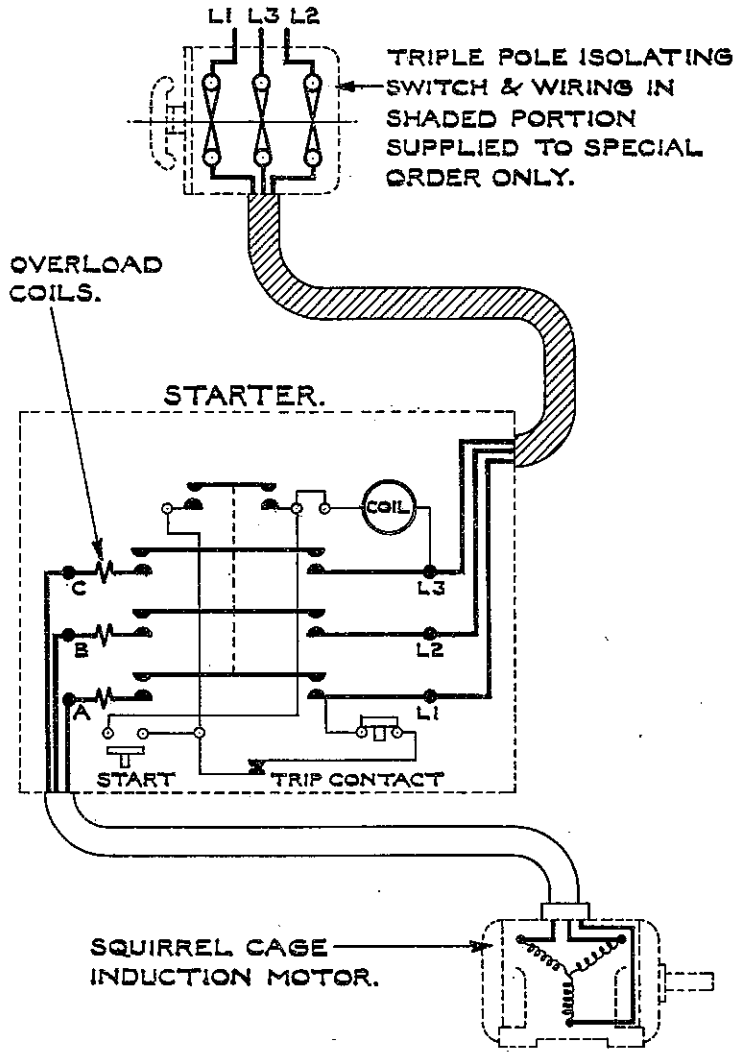
(2) Overloads have tripped. They will reset automatically after a short time, and the machine can be restarted in the usual manner.

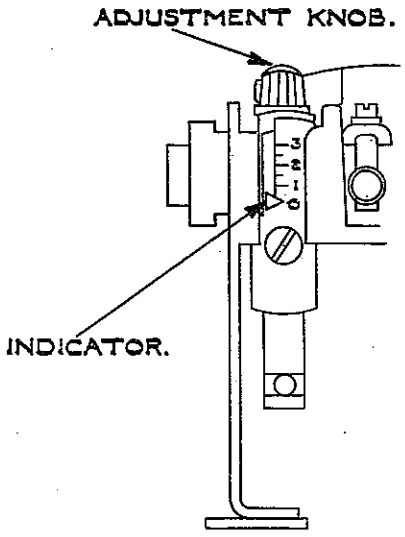
ADJUSTMENT

For a finer overload setting, set the load indicator to a lower value, and vice-versa for a less fine setting.

GENERAL

Check the earth connection from time to time. Users are recommended to display in an appropriate position in the maintenance department Wadkin Electrical Maintenance Instruction Card, No. 356, which is issued gratis on application.





TO SET OVERLOAD TRIPS.

MOVE INDICATOR TO FULL LOAD CURRENT OF MOTOR. TRIPS WILL THEN OPERATE AT APPROXIMATELY 20% TO 30% OVERLOAD AFTER ATTAINING FULL LOAD TEMPERATURE.

INSTALLATION INSTRUCTIONS.

FIT TRIPLE POLE ISOLATING SWITCH NEAR MACHINE UNLESS SUPPLIED BY BURSGREEN LTD., TO SPECIAL ORDER SO THAT THE ELECTRICAL GEAR MAY READILY BE ISOLATED FOR INSPECTION PURPOSES. BRING LINE CABLES TO ISOLATING SWITCH & TO L1, L2, L3 AT CONTACTOR THROUGH CONDUIT WHICH SHOULD BE SCREWED INTO THE MACHINE AND SECURED BY MEANS OF BUSHES & LOCKNUTS. CABLING SHOWN THUS ////// TO BE CARRIED OUT BY CUSTOMER UNLESS ISOLATING SWITCH HAS BEEN FITTED BY BURSGREEN LTD.,

OPERATING INSTRUCTIONS.

TO START, CLOSE ISOLATING SWITCH AND PRESS GREEN BUTTON MARKED "ON." TO STOP PRESS RED BUTTON MARKED "STOP"

EARTH MACHINE.

OVERLOAD.

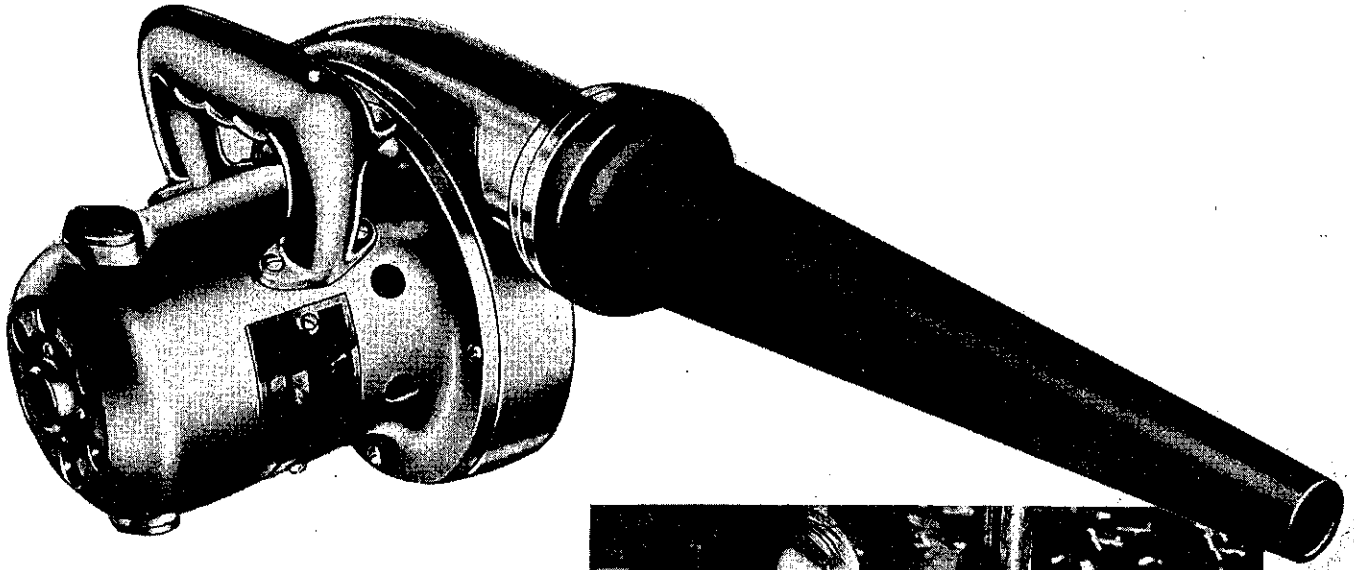
FOR A FINER SETTING OF OVERLOAD, SET LOAD INDICATOR TO A LOWER VALUE AND VICE VERSA FOR A LESS FINE SETTING. LOAD INDICATOR SHOULD ONLY BE MOVED A SMALL AMOUNT AT A TIME. SHOULD THE MOTOR STOP DUE TO OVERLOAD WAIT FOR A SHORT TIME TO ALLOW THE RELAYS TO COOL AND THEN START IN THE USUAL MANNER.

ROTATION.

ENSURE THAT DIRECTION OF ROTATION IS CORRECT BEFORE PUTTING MACHINE INTO SERVICE. TO REVERSE ROTATION INTERCHANGE LEADS L1 & L2

WADKIN LTD.
LEICESTER.

DIAGRAM OF CONNECTIONS. D. 165/3.



. . . blow away harmful dust, chips and dirt with a Wadkin Electric Blower

No motor can run at its maximum efficiency with its ventilating duct or control gear covered with dust and dirt. Sooner or later the resultant overheating will cause serious trouble.

Similarly, accumulations of chips and dust, in the mechanical parts of the machine can interfere with its efficiency. A few minutes a week for blowing down all Woodworking Machinery will be amply repaid in better and easier running, in increased life, and freedom from breakdown.

Blowers can be supplied for single phase A.C. or Direct Current for any voltage up to 250.

Please state voltage when ordering.