

Wadkin

CHAIN AND CHISEL MORTISER, TYPE M.C.

PRINCIPAL DIMENSIONS AND CAPACITIES

Will take timber up to	11" deep x 8" wide
Will take doors of any standard length from a minimum of 14" wide to 3'3" wide, and up to 2 $\frac{1}{4}$ " thick	
Maximum depth of mortise in doors	6"
Maximum size of mortise using chain	1 $\frac{1}{4}$ " x 3" x 6" deep
Maximum size of square chisel for hardwoods	$\frac{3}{4}$ "
Maximum size of square chisel for softwoods	1"
Will bore up to	1" diam. x 5 $\frac{1}{2}$ " deep
Size of table	27" x 8"
Minimum height of joinery table from floor	26 $\frac{1}{4}$ "
Longitudinal motion of table	24"
Transverse motion of table	5"
Horse power of motor	4
Speed of motor on 50 cycles supply	2800 r.p.m.
Net weight in cwts.	16 $\frac{1}{4}$ (1820 lbs)
Shipping dimensions in cu. ft.	68

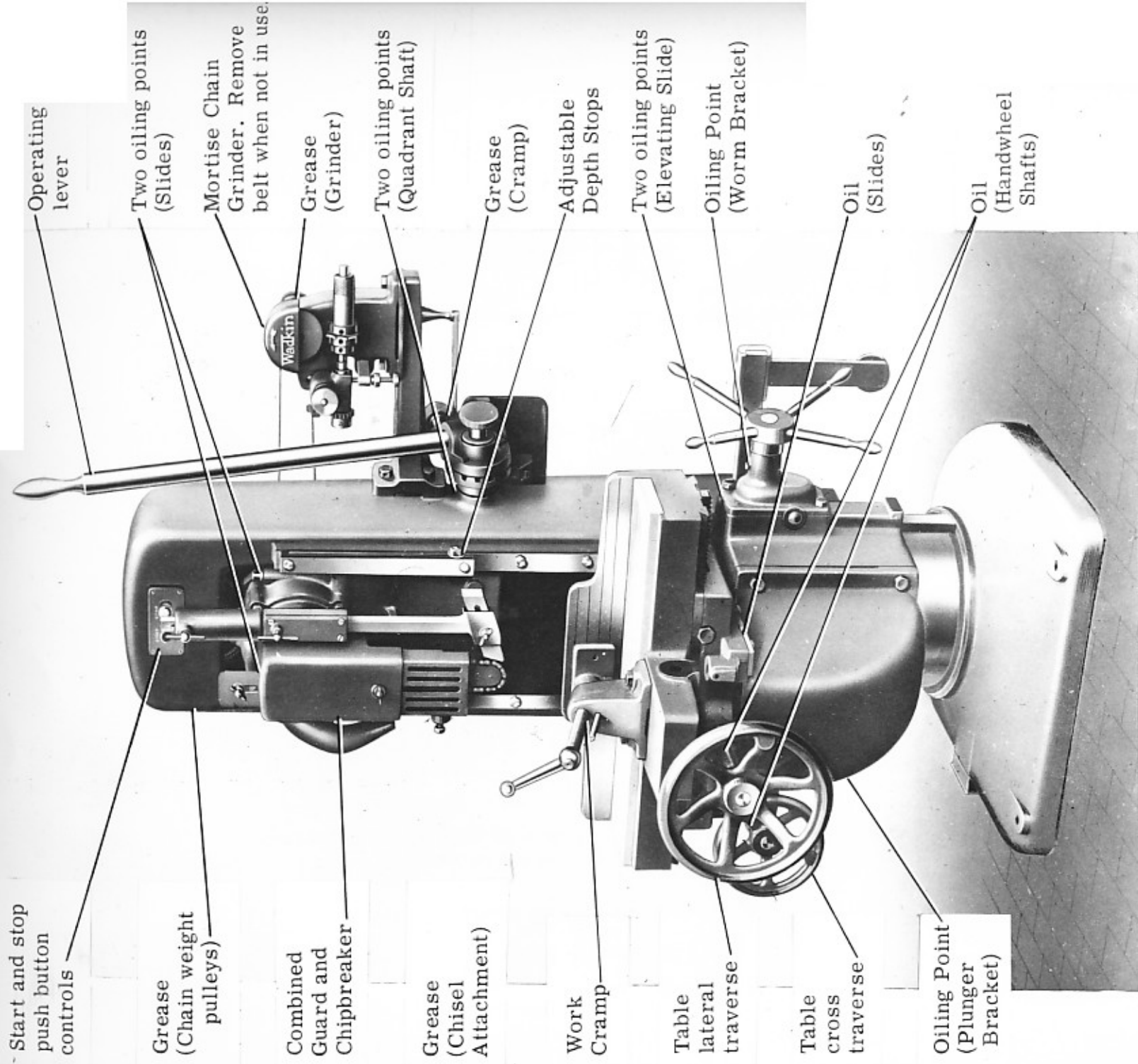
DETAILS INCLUDED WITH THE MACHINE

One chain cutter grinder with emery wheel 4" diameter and three pairs of sprockets to take mortise chains .54", .62", .89" pitch.
One set of adapter bushes, comprising one each 3/16", 1/4", 3/8" for bits and 13/16" and 1 3/16" for chisels.
One set depth stops. One driving belt for chain grinder. One set spanners.
One grease gun and sample tin of ball bearing grease lubricant.



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LUBRICATION



FRONT VIEW OF MACHINE SHOWING PRINCIPAL CONTROLS AND LUBRICATION POINTS

INSTALLATION

The machine is despatched from our works with all bright surfaces greased to prevent rusting. The grease must be removed by applying a cloth damped in paraffin or turpentine.

THE MOTOR. SEE END OF BOOKLET FOR ELECTRICAL INSTALLATION.

LUBRICATION

The following ball bearings to be given three charges with the grease gun every three months :—

- (a) Motor bearings.
- (b) Chain grinder bearings.
- (c) Chisel attachment bearings.

GIVE ONE OR TWO CHARGES with the grease gun WEEKLY to :—

- (d) Chain weight pulleys.

ALL OILING POINTS to be lubricated DAILY.

It is recommended that only Wadkin special grease lubricant be used, Grade L 6.
Alternative grease if required is :

Shell Mex and B.P. Ltd.	Shell NERITA grease 3
Vacuum Oil Co. Ltd.	GARGOYLE grease B.R.B.3.
Caltex Lubricants	..	.	REGAL STARFAK No. 2 grease

The efficient lubrication of mortise chains during operation has always been a difficulty and therefore we have introduced a greasing arrangement which it is considered will prolong the life of the chain. The improvement incorporates a grease nipple in the Guide Bar and from which the lubricant is carried down the Bar and into the Bottom Roller.

Should the mortise chain be in operation for a longer period, it is essential to give one or two depressions of the grease gun every half hour. The exact period for lubricating must be decided by the operator. Do not allow the Guide Bar to become hot.

THOROUGHLY CLEAN DOWN MACHINE WEEKLY

BALL BEARING LIST

Where used on machine	Maker's No.	Number per machine	Bearing size
Motor shaft	SKF RM 8 F	1	1" bore, 2 $\frac{1}{2}$ " outside, $\frac{3}{4}$ " wide
Motor shaft	SKF RM 9 F	1	1 $\frac{1}{8}$ " bore, 2 $\frac{13}{16}$ " outside, $\frac{13}{16}$ " wide
Chisel head	SKF RL 8 F	2	1" bore, 2 $\frac{1}{4}$ " outside, $\frac{5}{8}$ " wide.

THE TABLE

It is necessary to fit into the full length of the metal table a piece of hard wood about $1\frac{1}{4}$ " thick to prevent the mortise from splitting out at the bottom as the chain descends to maximum depth. This must be dead parallel and renewed as occasion arises.

CHAIN MORTISING

The mortise chain must revolve so that the cutting edges descend into the work as Fig. 1. Use only the sprocket wheel and guide bar for the size of mortise required. Each is clearly marked. Keep the chain adjusted so that it can be pulled away from the bar $\frac{1}{4}$ " as at Fig. 1. Screw 'B' above the bar 'C' is to adjust the chain to the correct tension and to take the thrust of the bar. The chain when new should run idle for a few minutes and be readjusted before being put to use. Lubricate about every half hour see page 3.

Do not force chain into the wood, but feed smoothly. Do not traverse table while the chain is in the mortise. To cut a longer or wider mortise than the chain allows, bring chain out of cut and traverse table before making second cut. Although the mortise chains are supplied suitable for general work in hard and soft woods it is advisable when wet oak is used to grind them to a special angle.

The guide bar 'C,' Fig. 1, is held in position by guide block 'D,' Fig. 2, and the chain sprocket 'E' is attached to the main spindle and held tight by nut 'F,' Fig. 2. The correct working position for the bar 'C' is when the fixing bolt is in the centre of the slot and the mortise chain tensioned in the manner described above.

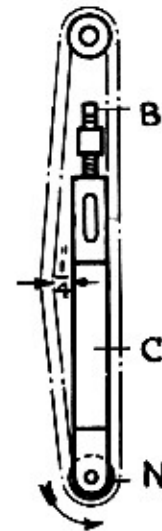


FIG. 1

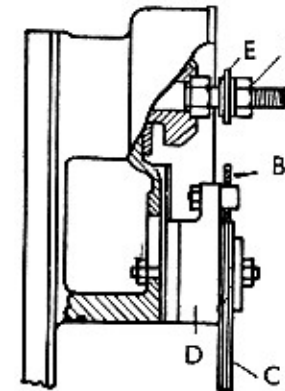


FIG. 2

COMBINED GUARD AND CHIPBREAKER

To meet Factory Regulations the guard must always rest on the work and rise and fall as the mortise chain is brought into the cut. The locking handle on the hinge spindle adjusts the movement of the guard according to the depth of the timber being mortised. The wood chipbreaker must be close to the chain at all times and ride on the top face of the work in order to avoid splitting the top edge of the mortise. The chipbreaker should be made in hard wood and renewed when necessary.

SQUARE CHISEL ATTACHMENT

The attachment is shown at Fig. 3 and is quickly fixed in position between square slides. To give accurate mesh to the driving gears a pin 'G' is fixed to obtain definite location. If this pin is lost it is of the utmost importance to renew it otherwise the gears are very quickly destroyed.

When fixing this attachment the chain block 'D' and sprocket 'E', Fig. 2, must first be removed.

SQUARE CHISEL MORTISING

Do not allow the lips or spurs of the bit to touch the cutting edge of the chisel, they must be set $\frac{1}{32}$ " clear. To set the bit correctly, first keep the lips close up to the cutting edges of the chisel and at the same time set the shoulder of the chisel $\frac{1}{32}$ " from the machine chuck as shown at 'H,' Fig. 3. When in this position securely lock the bit and afterwards push the chisel until the shoulder is in contact with the face of the chuck and finally lock tight. Both chisel and bit must be a good fit in the machine. Do not jerk the tool into the wood, but give steady pressure with the hand lever. Withdraw the tool occasionally from the work to allow the bit to clear itself of chips. A set of bushes is supplied sufficient to take the full range of Wadkin chisels and bits up to the machine capacity.

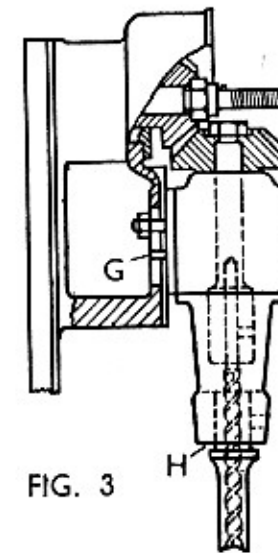


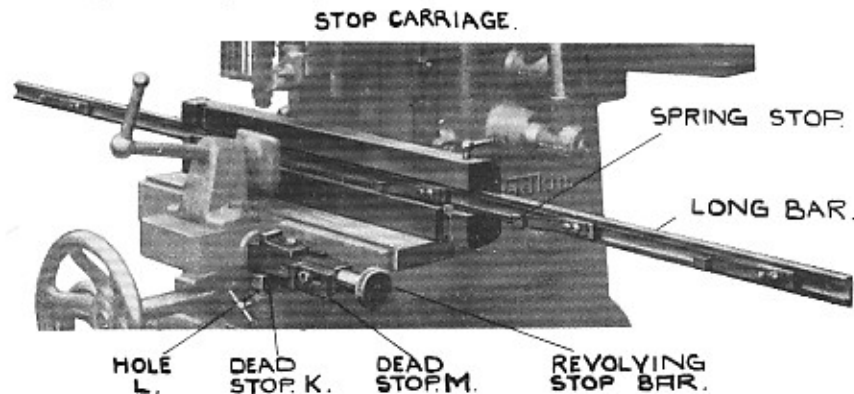
FIG. 3

HAND LEVER

This is adjustable to suit the most convenient position for working by undoing the locking wheel at the back of the clutch and fixing in any of the clutch slots.

STOPS

Stops for regulating the depth of mortise are attached to the main slide.



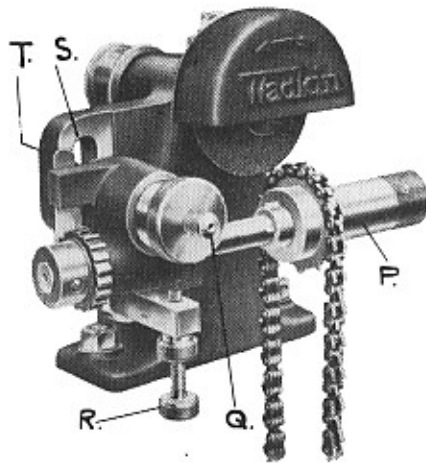
AUTOMATIC STOP ATTACHMENT

Stop carriage is secured to machine table by screws inserted through holes provided in fence. The revolving stop bar is secured to table in hole in the side of fence extension of table, and the locknuts adjusted to enable stop bar to rotate freely, but without any end play. The steel ball, spring and grub screw are inserted in hole under the boss carrying stop bar. The steel ball will then locate stop bar in any of its four positions. Dead stop is fitted in hole 'L' as shown.

The spring stops are set on the long bar to locate the position of each mortise to be cut. Before

GIVE TWO DEPRESSIONS OF THE GREASE GUN EVERY SIX MONTHS

making the cut the table is set over to dead stop 'K.' If a longer mortise is required than cutter will give at one stroke, the stops 'M' on stop bar must be set accordingly. Four varying lengths can be provided to give required length of mortise in conjunction with dead stop.



UPKEEP OF TOOLS

It is advisable to take off the chain and guide bar and place in oil overnight. When not in use keep all chain sets continually in a bath of thick oil. Remove the roller bearing 'N,' Fig. 1, from the guide bar occasionally and thoroughly clean.

CHAIN GRINDER

The mortise chains should be sharpened with an oil stone slip on the face 'O' only, Fig. 5. Care being taken to sharpen square across each link.

When this is no longer adequate and to bring the chain cutters into correct angle for clean cutting they should be ground on the special grinder.

FIG. 4

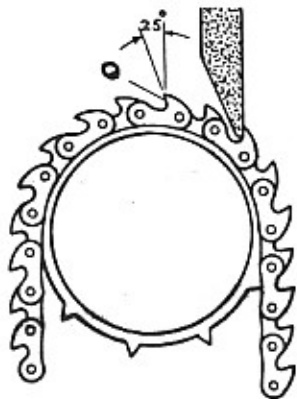


FIG. 5

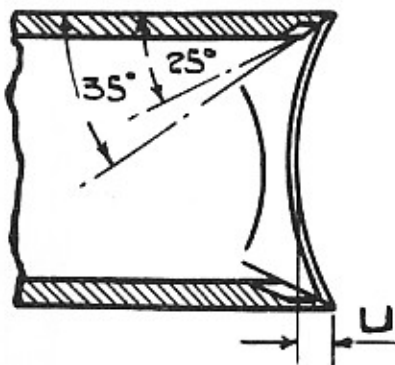


FIG. 6

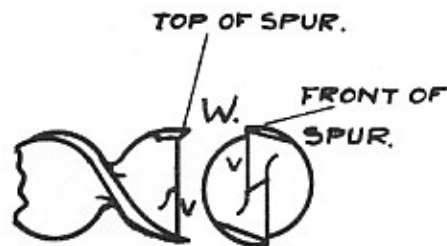


FIG. 7

The grinder is driven by belt from a pulley at the rear end of the motor. It is necessary to slightly lower the motor when using the grinder in order to give the correct tension to the driving belt.

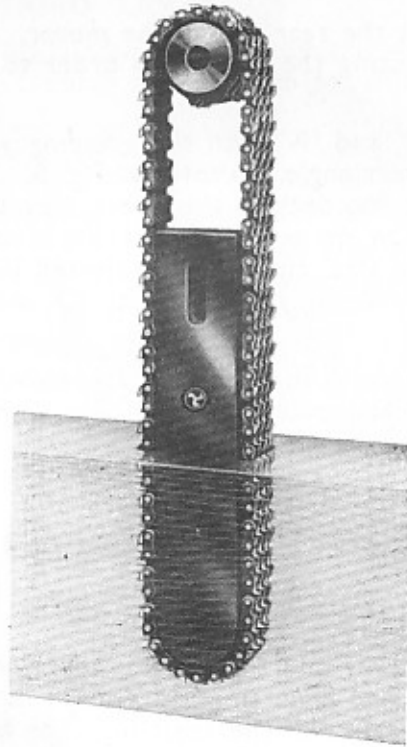
The sleeve 'P,' Fig. 4, is adjusted by nuts 'Q' and 'R' until the grinding wheel lightly touches the face of the link at the correct angle as shown at Fig. 5. Each link must be ground on the face only and not too deep in the gullet, care being taken always to retain the angle as new. On no account must the sides be ground. As the grinding wheel is reduced in size, the slide is adjusted in slot 'S' and locked by nut 'T,' the fine adjustment being given by nuts 'Q' and 'R' Fig. 4.

As a link is ground by sliding the sleeve 'P' along the bar each successive one is brought into position for grinding by the spring ratchet wheel. The sprocket wheels carrying the chain on sleeve 'P' are adjustable to accommodate varying widths of chain. Three pairs of these sprockets are supplied with the grinder.

SQUARE CHISELS AND BITS

The chisel must be sharpened on the inside only and the cutting edges should be shaped to give a curve as shown at Fig. 6 and maintained in a shape as new. Never file the outside as this will reduce the size of the mortise. The bevels of the cutting edges must meet exactly at the corners. The depth 'U' from the corner point to the curve at the centre should be about $\frac{1}{8}$ th the diameter of the size of the chisel. The cutting edges must be as short as possible and filed to an angle of about 35° as shown at Fig. 6. The part behind the cutting edges must then taper off to an angle of 25° . It is recommended that the special tool illustrated overleaf is used to ensure the correct angle on all four cutting edges of the chisel.

The bit is sharpened by filing above the cutting edges 'V' keeping the file at an angle of 15° . They must be kept in a straight line with the inside points extending past the centre as shown at Fig. 7. The spurs 'W' must be sharpened on the top and front only, never on the outside. They must be kept in line with the cutting edges 'V.' When a bit is worn away by frequent sharpening replace by a new one, otherwise the square chisel may be split at the cutting edge. Use a file of very fine grade for sharpening both chisels and bits.



NEW TOOLS AND REPLACEMENTS

We can supply most sizes of chain sets and square hollow chisels from stock.

Users are advised to obtain these direct from us to ensure fitting the machine correctly.

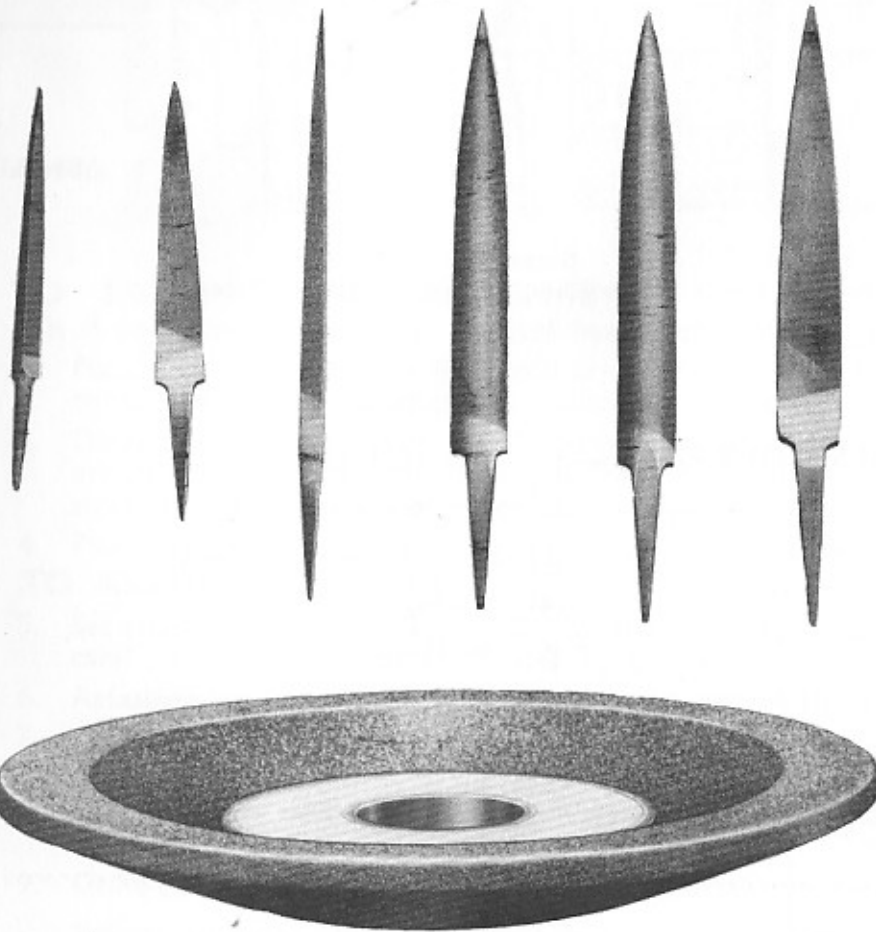
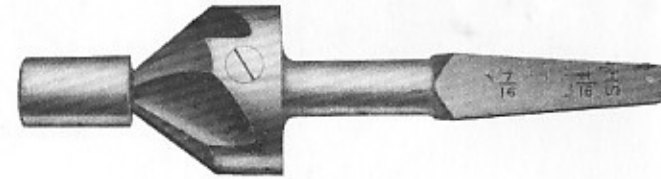


BORING BIT. Although the machine is primarily used to mortise square or rectangular to receive the tenon joint, it can be used should occasion arise to drill holes up to a maximum of 1" diameter, 5½" deep. The illustration shows a two-fluted centre bit with ½" shank to fit the chisel spindle, which is the type recommended for the purpose.

SHARPENER FOR HOLLOW MORTISE CHISELS

This tool has been specially produced to enable mortise chisels to be kept always properly sharpened. It is used in an ordinary joiner's brace, and is maintained centrally with the axis of the chisel by means of a pilot which fits the bore of the chisel.

This ensures all four cutting edges being ground to the correct angle. Only the corners of the chisel require to be finished off with a file.



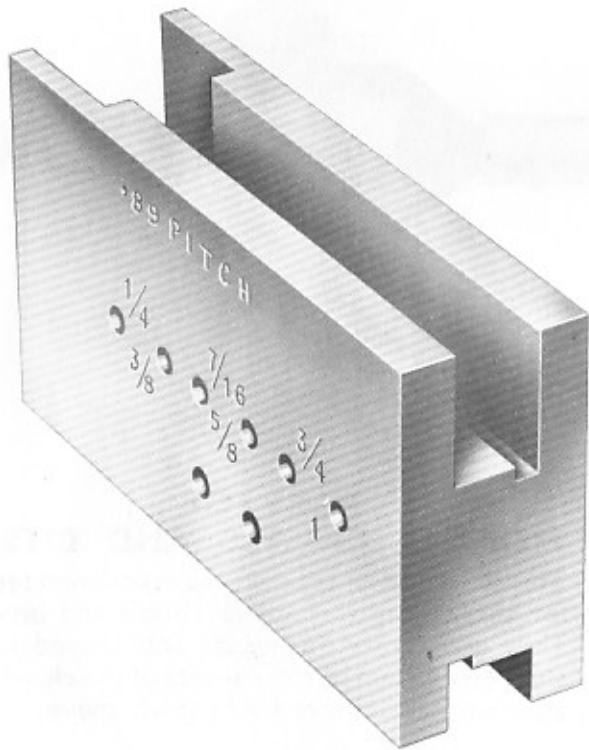
FILES FOR MORTISE CHISELS AND BITS.

This is the set of special files recommended for sharpening the square chisels and bits. They are a very fine grade and shaped to sharpen efficiently, the corners of the chisels after using the brace tool shown above.

WHEELS FOR MORTISE CHAIN GRINDER.

The 4" diameter wheel illustrated, Grade No. A.60 M.V. is used on the Chain Grinder for sharpening the mortise chains. It is essential to true up the wheel with a grinding wheel dresser, when running at the normal speed, before being used. The edge must be dressed to the desired thickness to suit the links of the mortise chain.

REPAIR TOOLS FOR MORTISE CHAINS



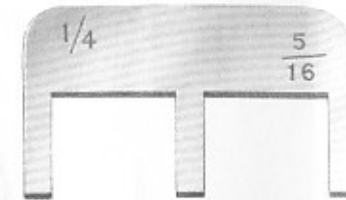
First
Breaking Punch



Second
Breaking Punch



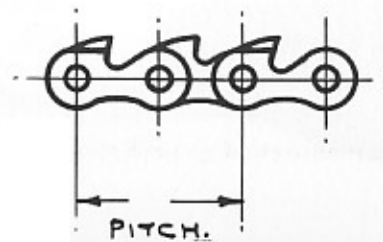
Making Punch



Breaking Fork

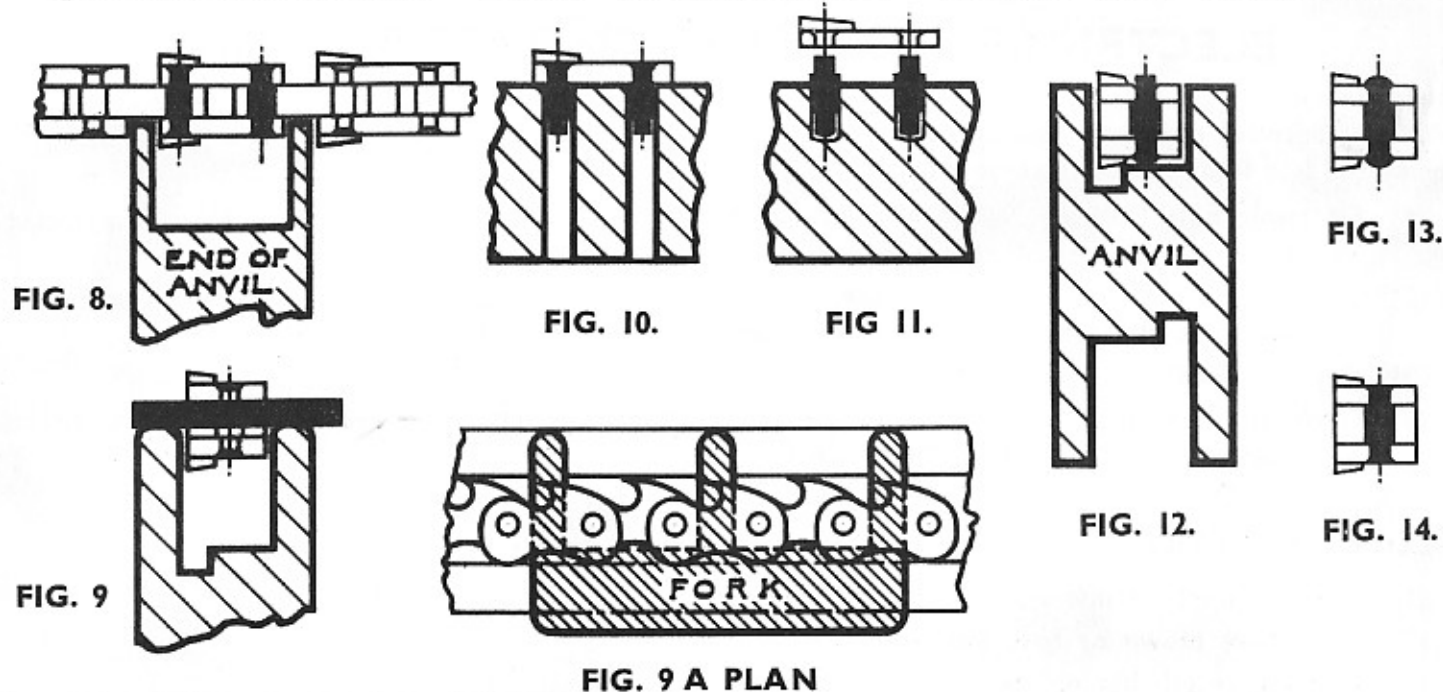
- ONE SET OF TOOLS COMPRISES :—
- (1) One anvil block
 - (2) First breaking punch
 - (3) Second breaking punch
 - (4) Making punch
 - (5) Breaking fork

NOTE.— One set of tools is necessary for each pitch of mortise chain.



- 54" pitch.
- 62" pitch.
- 89" pitch.

INSTRUCTIONS FOR REPAIRING MORTISE CHAINS



TO REMOVE BROKEN LINKS

It is important to grind flat all rivet heads before driving out rivets.

2. Place chain on anvil block fig. 8 and drive a little with "first breaking punch" on each rivet, allowing both to be driven out together with bottom side link.
3. Drive rivets right through with "second breaking punch." NOTE. Shouldered rivets will not permit pins driven out separately. Due to fragile links on $\frac{1}{4}$ " and $\frac{5}{16}$ " wide chains use "breaking fork" figs. 9 and 9/A for support of chain by placing over narrow deep — groove in anvil.
4. Place side link on anvil block fig. 10 and use "first and second breaking punches" to remove rivets.

TO ASSEMBLE CHAIN

5. Set rivets in one pair of blind holes in anvil block fig. 11 and tap outer link on to heads of rivets, afterwards carefully pean over rivet heads with light hammer.
6. Assemble links with necessary centre and outer links.
7. Place chain along groove of anvil block fig. 12 and support the overhanging end. The chain must be placed in the groove to give maximum support. The deep groove for wide chains and shallow one for narrow chains.
8. Carefully rivet down or swell out heads of rivets fig. 13. with the "making punch" which must be used for finishing only.
9. Grind down rivet heads to finish similar to remainder of chain fig. 14.

Before using a repaired chain carefully grind any new links to the same amount of gullet as the remainder of the chain.

ELECTRICAL INSTALLATION INSTRUCTIONS

The cabling between the motor and the control gear has been carried out by Wadkin 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 Wadkin 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 right 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.
- (4) Lock-off or stop button has not been released.

STOPPAGE DURING OPERATION AND FAILURE TO RESTART

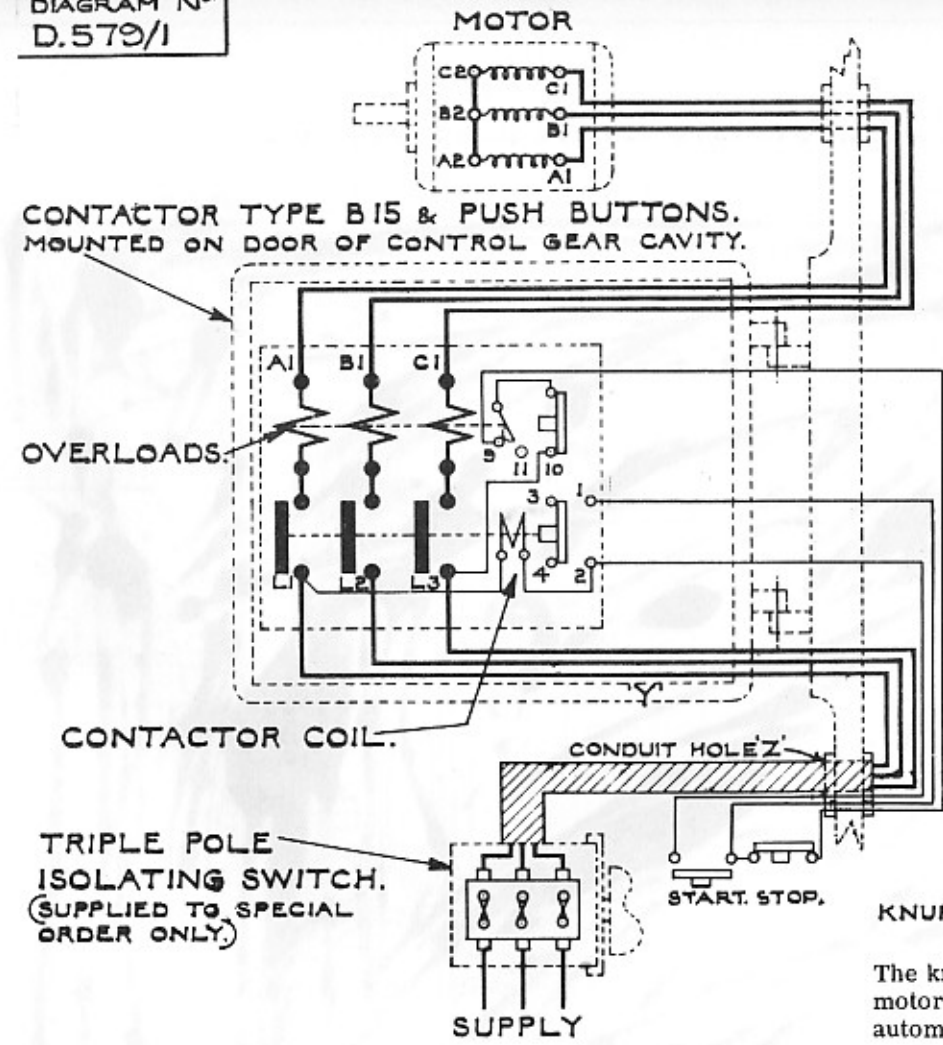
- (1) Fuses have blown.
- (2) Overloads have tripped. They will reset automatically after a short time, and the machine can be restarted in the usual manner.

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.



CONTACTOR TYPE B15 & PUSH BUTTONS.
MOUNTED ON DOOR OF CONTROL GEAR CAVITY.

OVERLOADS.

CONTACTOR COIL.

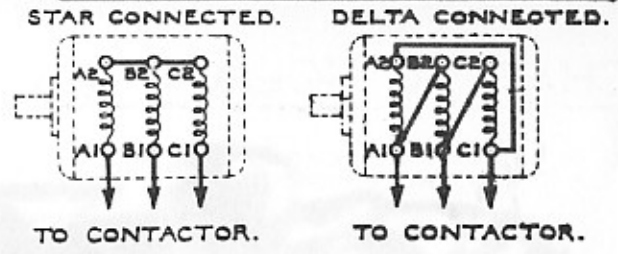
TRIPLE POLE
ISOLATING SWITCH.
(SUPPLIED TO SPECIAL
ORDER ONLY)

SUPPLY

CONDUIT HOLE 'Z'

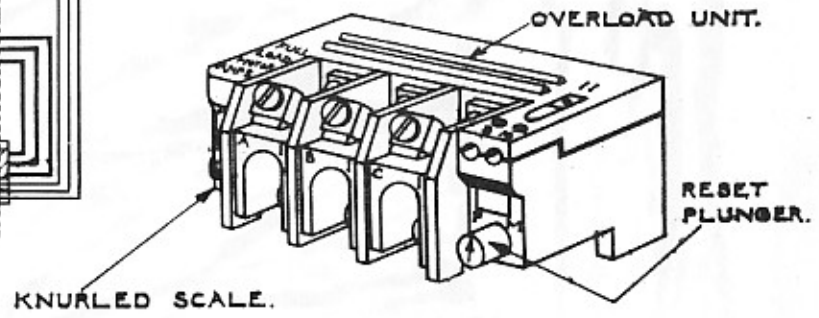
START STOP.

DUAL VOLTAGE MOTORS ONLY.



When dual voltage motors are employed the following connections are made:-
200/250 volt circuits, motor delta connected.
340/440 volt circuits, motor star connected. The necessary connections are made either in the control gear cavity or at the motor terminal block.

OVERLOAD PROTECTION.



The knurled scale should be set at the full load current of the motor. The arrow on the reset plunger should point to 'M' for automatic reset and 'P' for hand reset.

INSTALLATION INSTRUCTIONS.

Fit triple pole isolating switch near machine, unless supplied by Wadkin Ltd. to special order, so that the electrical gear may readily be isolated for inspection purposes. Bring supply cables to isolating switch and to L1 - L2 - L3 at contactor through conduit which should be screwed into the machine and secured by means of locknuts. A hole is provided in the machine frame at 'Z' for the conduit carrying the cables to the contactor. Leave sufficient slack in the cables at 'Y' to allow the door to open freely. Ensure that the machine is adequately 'earthed' and that the direction of rotation of the motor is correct before putting machine into service. To reverse rotation interchange L1 and L3.

OPERATING INSTRUCTIONS.

To start machine, close isolating switch and press 'start' button. To stop machine press 'stop' button. To lock off machine, press and turn stop button. This must be released before a start can be made.

NOTE:- Cabling shown thus to be carried out by customer unless isolating switch has been fitted by Wadkin Ltd.