

Wadkin

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HEAVY DUTY PRECISION RADIAL ARM ROUTER, TYPE H. Y. R.

PRINCIPAL DIMENSIONS AND CAPACITIES.

	English	Metric
Maximum effective radius of stroke	6'1"	1854 mm
Minimum effective radius of stroke	2'9"	838 mm
Rise and fall of head in slide	11"	279 mm
Stroke movement of head	4"	102 mm
Spindle speeds in r. p. m.) On 50 cycles	18,000 and 12,000	18,000 and 12,000
Horse power of spindle motor) supply.	12 $\frac{1}{2}$ /10	12 $\frac{1}{2}$ /10
Spindle speeds in r. p. m.) On 60 cycles	18,000 and 10,800	18,000 and 10,800
Horse power of spindle motor) supply.	15/9	15/9
Net weight in cwts.	71 (7952 lbs.)	3,607 kilos
Shipping dimensions in cubic feet	270	7.65 cubic metres

OPTIONAL EQUIPMENT TO SPECIAL ORDER.

Size of power rise and fall table	7'0" x 3'0"	2134mm x 914mm
Maximum height of table	2'11"	889 mm
Minimum height of table	2'3"	686 mm
Maximum distance from table to head guide bush	2'0 $\frac{1}{4}$ "	616 mm
Minimum distance from table to head guide bush	1 $\frac{1}{4}$ "	32 mm
Horse power of motor for rise and fall table	1	1
Size of fixed table with packing strips	4'8" x 3'2"	1422mm x 965mm
Maximum height of table	2'8"	813 mm
Minimum height of table	2'0"	610 mm
Maximum distance from table to head guide bush	2'3 $\frac{1}{4}$ "	692 mm
Minimum distance from table to head guide bush	4 $\frac{1}{4}$ "	108 mm

OPTIONAL EQUIPMENT TO SPECIAL ORDER (CONTINUED)

	English	Metric
Size of fixed table	7'0" x 3'0"	2134mm x 914mm
Height of table	2'11"	889 mm
Maximum distance from table to head guide bush	16 $\frac{1}{4}$ "	413 mm
Minimum distance from table to head guide bush	1 $\frac{1}{4}$ "	32 mm
Size of base plate	6'0" x 3'6"	1828mm x 1067mm
Height of base plate	8"	203 mm
Maximum distance from base plate to head guide bush	3'7 $\frac{1}{4}$ "	1099 mm
Minimum distance from base plate to head guide bush	2'4 $\frac{1}{4}$ "	718 mm
Equipment for suds mist lubrication to the cutter		
Power lock to the Radial Arm		
Power lock to the Barrel		
Six sided capstan stop bar with six sets of stops and dial gauge for indicating working depth and repeating depth.		

DETAILS INCLUDED WITH THE MACHINE

Router head	Concertina guards for radial arm
Frequency changer	Two guide bushes $\frac{1}{2}$ " x $\frac{3}{4}$ " and $\frac{5}{8}$ " x $\frac{7}{8}$ "
Control gear	Three collets 9/16", $\frac{5}{8}$ " and $\frac{3}{4}$ " bore
Oil gun	Set of spanners
Grease gun	

CUTTER EQUIPMENT

A complete range of cutter equipment is available for this machine. Full details are given in our Cutter Equipment Booklet No. 849.

BEARING LIST

Maker's Number	Size			Number Per Machine	Where used on machine
	Bore	Outside Diameter	Width		
Timken XC2141C - XC2141D	16.500"	18.750"	.875"	1	Top bearing for trunnion
Timken 52400 - 52618	4"	6.1875"	1.438"	1	Bottom bearing for trunnion
FG 411 Fischer Bearing	$\frac{7}{8}$ "	3"	1 $\frac{1}{8}$ "	16	8-Horizontal roller shaft for slide arm
					8-Vertical roller shaft for slide arm
SKF.08 Thrust Bearing	1"	1 $\frac{3}{4}$ "	$\frac{5}{8}$ "	1	For head raising screw

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 with paraffin or turpentine.

FOUNDATIONS.

Bolts $\frac{3}{4}$ " (19mm) diameter should be used to fix the machine and table to the floor but these are not supplied by Wadkin Ltd. unless specially ordered. If the mill floor consists of concrete no special foundation is necessary and rag bolts or plates and bolts may be used. The outline in Fig. 2 gives details of bolt positions and clearances required. Cut 4" (102mm) square holes in the concrete and with bolts in position run in liquid cement to fix the machine and table. The table and machine should be carefully levelled before fixing and again after final fixing to ensure that no distortion has taken place.

LEVELLING THE TABLE.

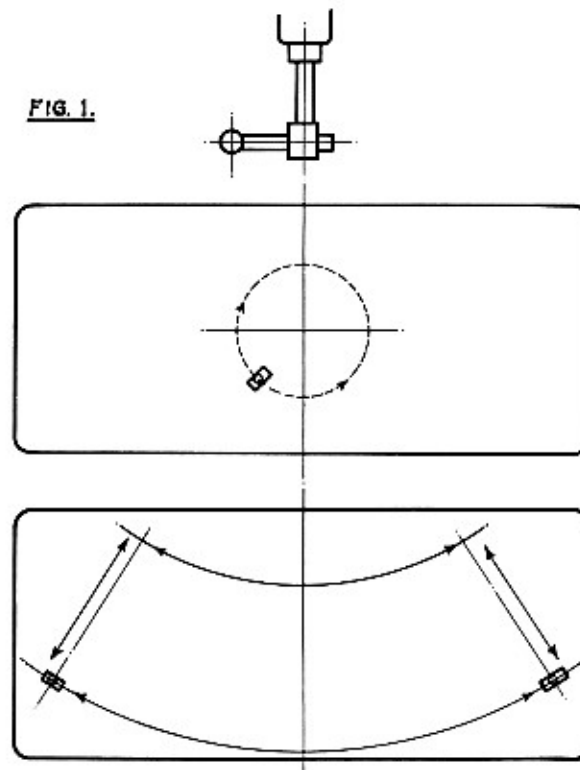
The table should be levelled first by placing a spirit level across its surface in both directions. Jackscrews being used to make any adjustment to the table when it has been fixed.

LEVELLING THE MACHINE.

The machine is then levelled from the table. This is possible as the slide is set square by Wadkin Ltd. before packing. The method is as shown in Fig. 1. A rod is secured by the cutter spindle collet and at the bottom is pivoted a rod of radius 10" (254mm), on the end of which is a dial indicator. Any departures from zero on the clock should be corrected by adjusting the level of the machine with jackscrews.

WIRING.

For cabling instructions see wiring diagram D. 952 on page 19. Refer to diagram D. 909 on page 20 for wiring details of rise and fall table supplied to special order.



LUBRICATION

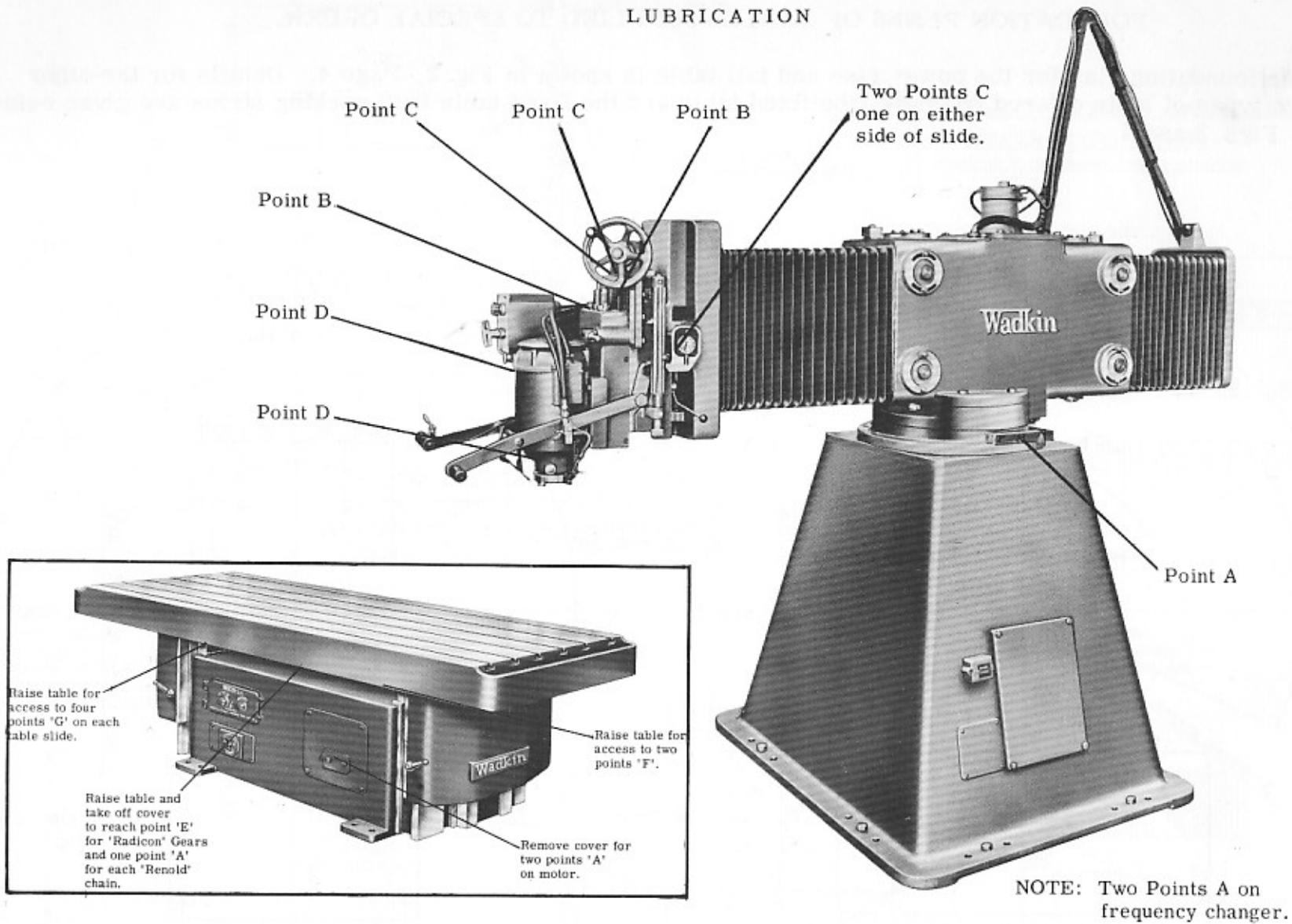


FIG. 5. GENERAL VIEW OF MACHINE AND POWER RISE AND FALL TABLE SHOWING LUBRICATION POINTS.

LUBRICATION (See Fig. 5)

- POINTS A Give 4 depressions of grease gun every 3 months using Wadkin grease Grade L. 6.
- POINTS B Fill oiler up daily with Wadkin oil Grade L. 4.
- POINTS C Give 1 depression of oil gun daily using Wadkin oil Grade L. 4.
- POINTS D (Router head spindle bearings). Give 1 depression of oil gun daily or 2 or 3 depressions if machine has been standing idle for longer than 48 hours using Wadkin oil Grade L. 1.
- POINTS E Inspect every month and if necessary top up to oil level with Wadkin gear oil Grade L. 2.
- POINTS F Inspect every month and if necessary fill up to level of notch on dipstick with Wadkin gear oil Grade L. 2.
- POINTS G Oil weekly with Wadkin oil Grade L. 4.

WADKIN RANGE OF OIL AND GREASE LUBRICANTS WITH EQUIVALENTS.

Wadkin Grade	Equivalent Lubricants		
	Shell Mex and B. P. Ltd.	Mobil Oil Co. Ltd.	Caltex Lubricants
Spindle Oil Grade L1.	Shell Vitrea Oil 27	Mobil Oil D. T. E. (Light)	Regal Oil B (R. & O.)
Gear Oil Grade L2.	Shell Vitrea Oil 69	Mobil Oil D. T. E. / BB	Meropa Lubricant No. 2 Oil
Machine Oil Grade L4.	Shell Vitrea Oil 33	Mobil "Vactra" Oil (Heavy Medium)	Caltex Aleph Oil
Ball Bearing Grease Grade L6.	Shell Nerita Grease 3	Mobil Grease B. R. B. No. 1.	Regal Starfak No. 2 Grease

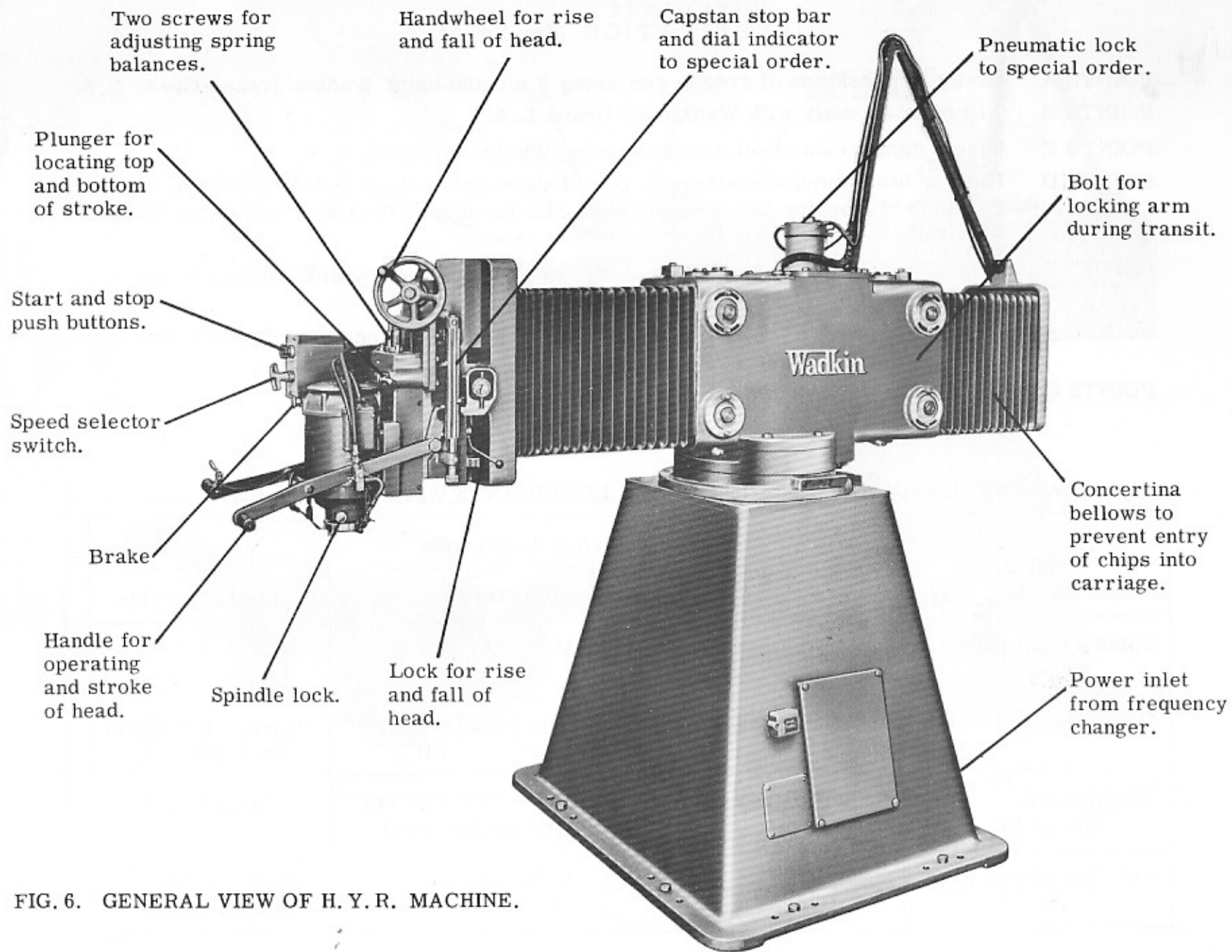


FIG. 6. GENERAL VIEW OF H. Y. R. MACHINE.

THE HEAD SLIDES

The head slides provide vertical movement for the router head. A female vee slide is bolted direct on the radial arm into which fits the second slide giving an 11" (279mm) rise and fall motion by means of a handwheel. This slide can be locked in any position with the lock shown in Fig. 7. To adjust this lock release locknut 'H', then unscrew lever 'J' and fit in next tapped hole in nut 'K'. Finally lock nut 'H'.

The front slide carries the router head and has 4" (102mm) of vertical movement controlled by operating handles. A spring loaded plunger is fitted to the front slide which engages into the second slide at the top and bottom of the 4" (102mm) movement. This enables the head to be quickly withdrawn and re-engaged in exactly the same position without disturbing the micrometer setting of the secondary slide.

To take up wear in the head slides release locknuts 'L' Fig. 8 and adjust slides by screws 'M'. Lock up nuts 'L' on completion.

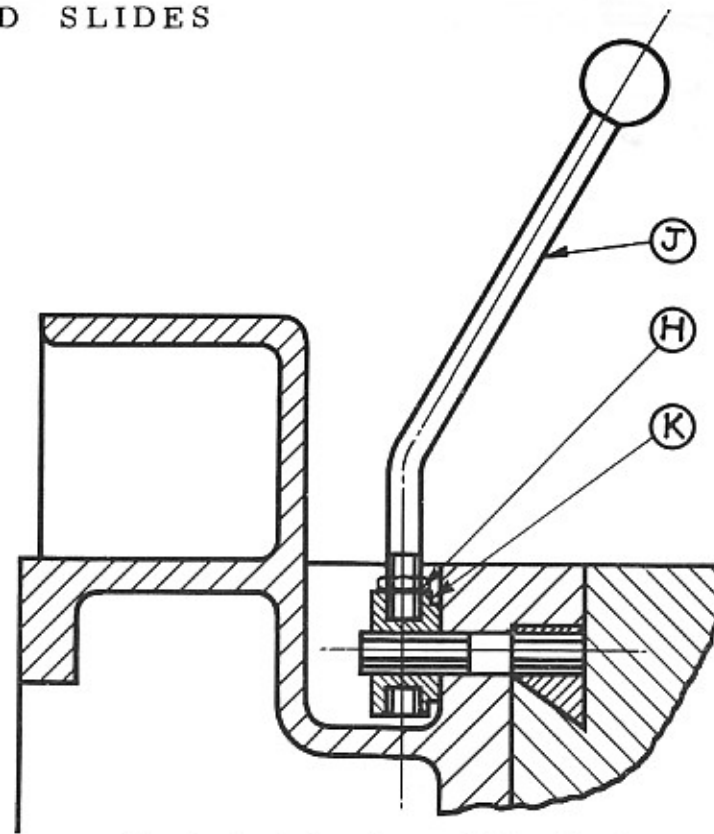


Fig. 7. Lock for rise and fall of head.

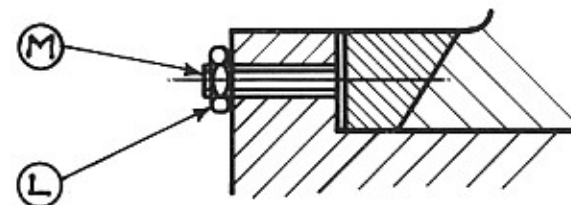


Fig. 8. Adjustment of head slides.

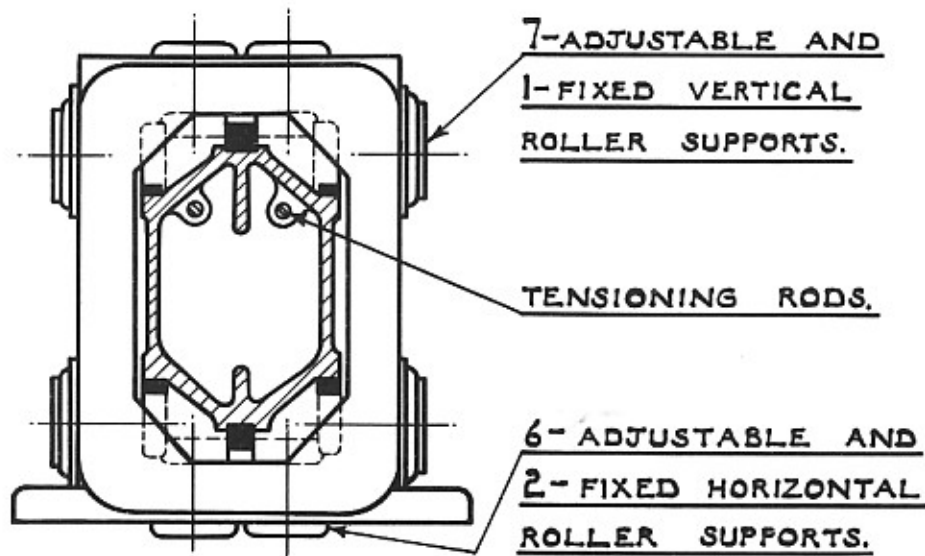


FIG. 9. SECTION THROUGH RADIAL ARM AND ROLLER BOX.

RADIAL ARM

The method of mounting the radial arm to ensure accuracy is shown in Fig. 9. Six nitralloy hardened rods are fitted to the radial arm. Concertina guards are incorporated to protect the rods and rollers from swarf.

ROLLER BOX

The nitralloy slide rods on the radial arm run on eight vertical and eight horizontal ball bearing rollers. Seven of the vertical and six of the horizontal rollers are adjustable to enable the head to be lined up with the table and to take up any wear. To adjust the roller slacken nuts 'N' Fig. 10, insert a tommy bar in the eccentric roller support 'P' and turn until the required position is reached, then tighten nuts 'N'. If it is necessary to increase tension in the tensioning rods tighten the hexagon nuts at rear end of the radial arm.

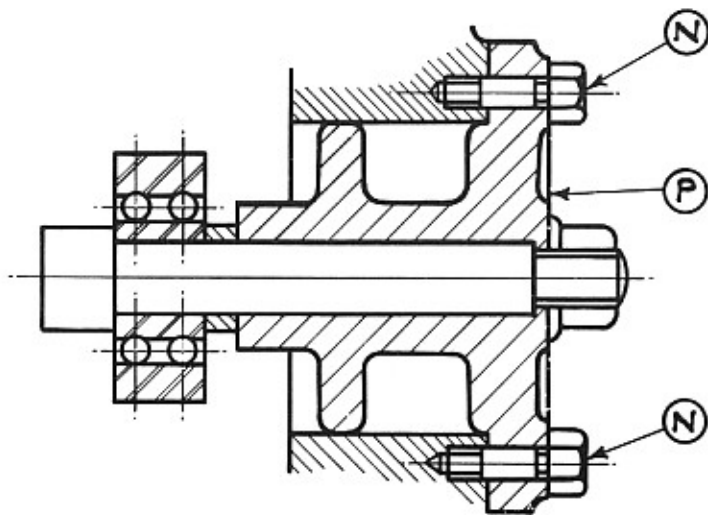


FIG. 10. SECTION THROUGH ROLLER STUD.

INSTRUCTIONS FOR DISMANTLING ROUTER HEAD

In the event of breakdown or for periodic overhaul the head should be returned to Wadkin Ltd. where a special department maintains a quick service for renewal of bearings etc.

If the customer prefers to overhaul the head himself, the dismantling should be obvious to a skilled engineer from the section at Fig. 11 but note the following points.

1. The bearings in this head are all of special high speed type and should be obtained from Wadkin Ltd.
2. Locknuts 'X' and 'Y' have left hand threads.
3. Locknut 'X' has a small counter-sunk locking screw which must be loosened before attempting to unscrew the locknut.
4. The three felt pads must be soaked with Wadkin Spindle Oil, Grade L1, before re-assembly.
5. Allow no trace of grit or dirt in the bearing housing.

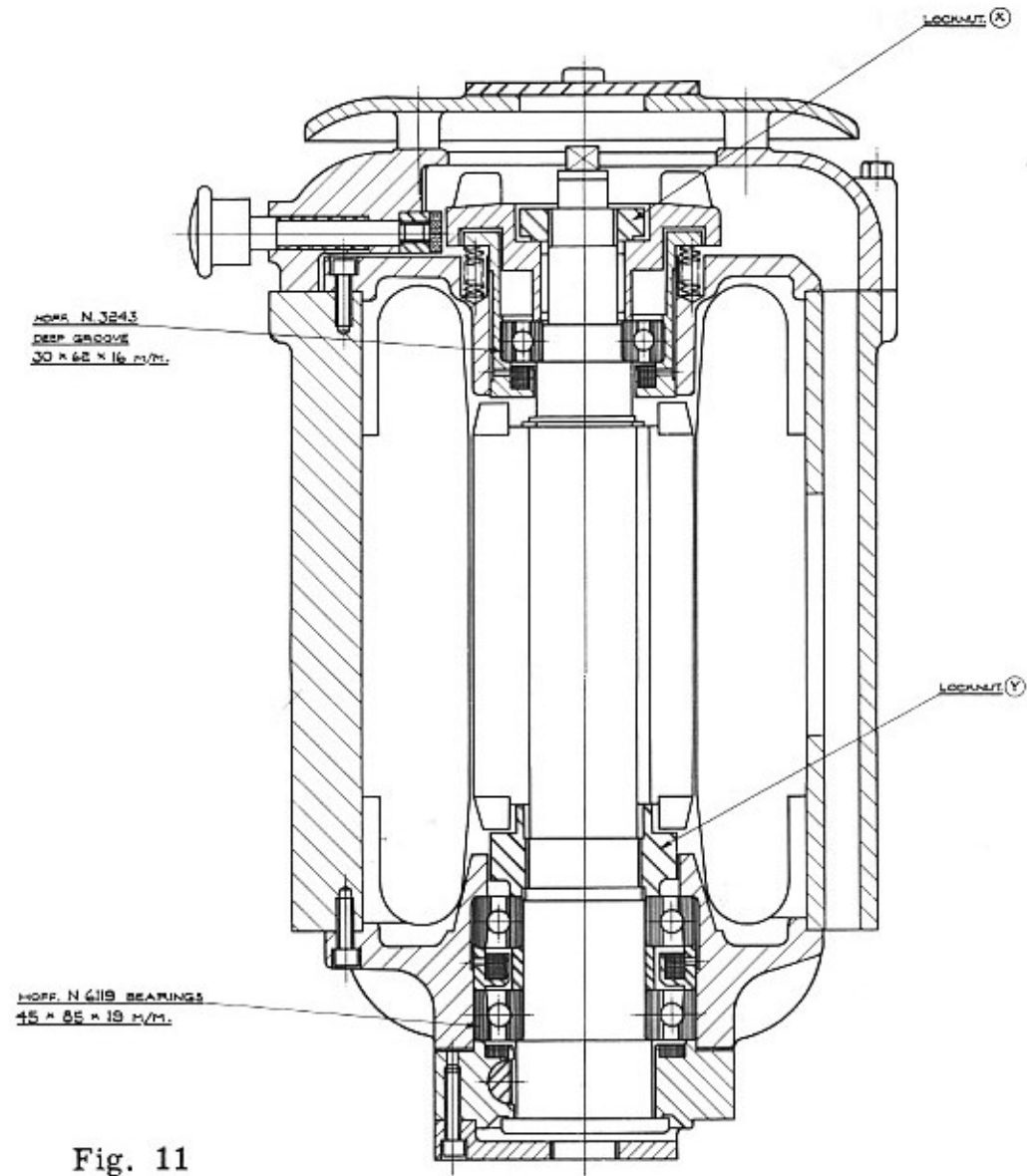


Fig. 11

SECTION THROUGH CUTTER SPINDLE.

SPINDLE LOCK

The spindle lock should be used to stop the spindle rotating when changing cutters. To lock pull out knob 'Q' Fig. 12.

Ensure that the lock is released before starting the head.

BRAKE

The hand brake should be applied GENTLY, ONLY after the stop button has been pressed.

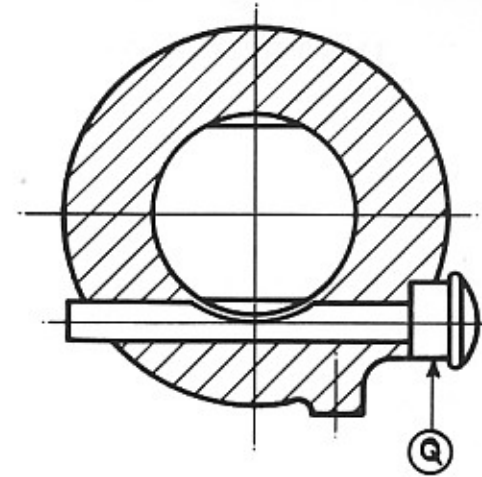


FIG.12 SPINDLE LOCK.

DIAL INDICATOR DEPTH CONTROL

(TO SPECIAL ORDER)

The attachment shown in Fig. 13 provides an accurate means of depth control. It consists of a capstan stop bar with six sets of stops and a dial gauge. With this attachment the operator can bring the head back to six different pre-determined vertical positions to within .001" (.025mm) as indicated on the dial. This method of depth control is for use when adjusting the secondary slide by handwheel.

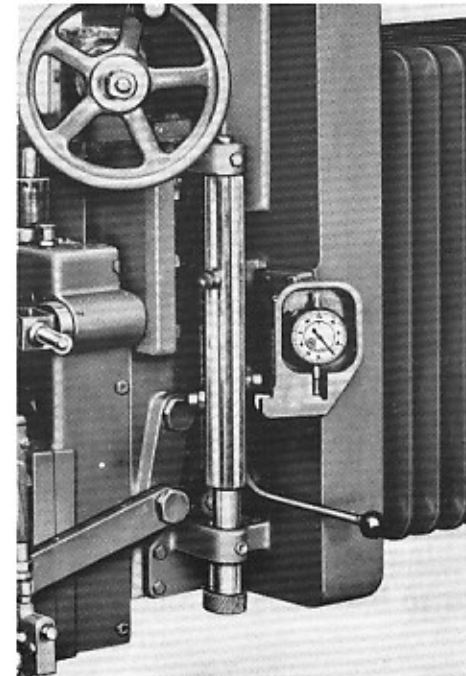


Fig. 13

DIAL INDICATOR DEPTH CONTROL

TABLES
(TO SPECIAL ORDER)

The three types of table offered, namely, a fixed table, a fixed table with packing strips and a power rise and fall table are illustrated in Figs. 14 to 17. Capacities for each table are as follows :-

Type of Table	Size	Height from floor	Distance from table to head guide bush	
			Maximum	Minimum
Fixed	7'0" x 3'0"	2'11"	16 $\frac{1}{4}$ "	1 $\frac{1}{4}$ "
Fixed with packing strips	4'8" x 3'2"	2'11"	16 $\frac{1}{4}$ "	1 $\frac{1}{4}$ "
Fixed without packing strips		or 2'8"	19 $\frac{1}{4}$ "	4 $\frac{1}{4}$ "
Power rise and fall	7'0" x 3'0"	2'0"	2'3 $\frac{1}{4}$ "	12 $\frac{1}{4}$ "
		2'11"	16 $\frac{1}{4}$ "	1 $\frac{1}{4}$ "
		2'3"	2'0 $\frac{1}{4}$ "	9 $\frac{1}{4}$ "

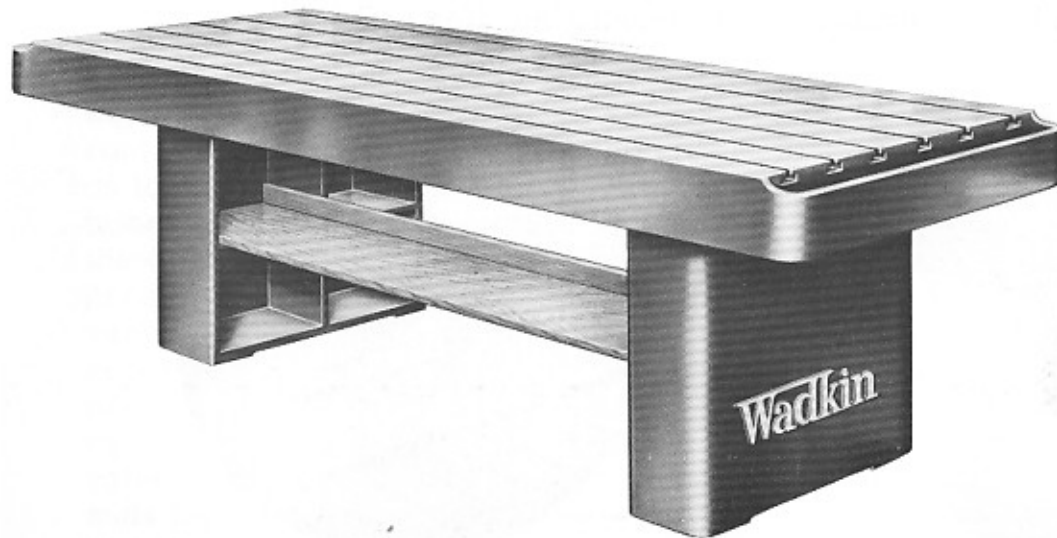


FIG. 14. FIXED TABLE.

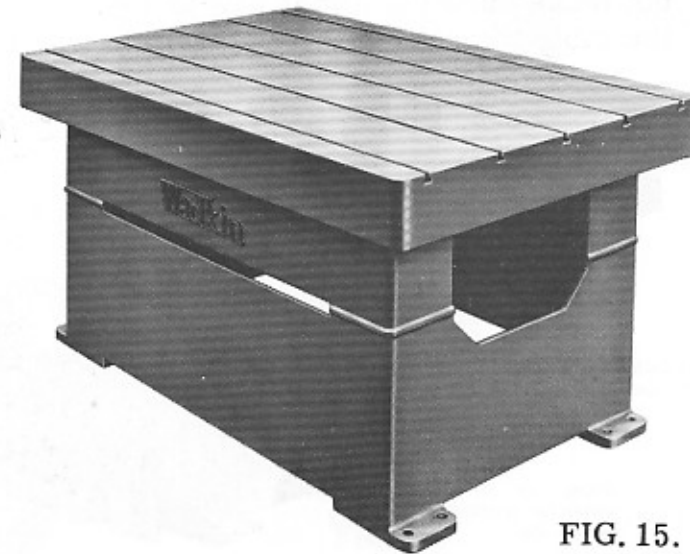


FIG. 15.
FIXED TABLE WITH PACKING STRIPS.

TABLES

ADJUSTMENT OF FIXED TABLE WITH PACKING STRIPS.

To lower the table proceed as follows :-

1. Unscrew the four hexagon head screws 'R' Fig. 16.
2. Lift the table top 'S' clear with a crane.
3. Unscrew the four hexagon head screws 'T'.
4. Remove the two packings 'U'.
5. Lower the table top 'S' onto the table body 'V' and secure by screwing the four screws 'T' back in position.
6. Reverse the above procedure when it is required to raise the table.

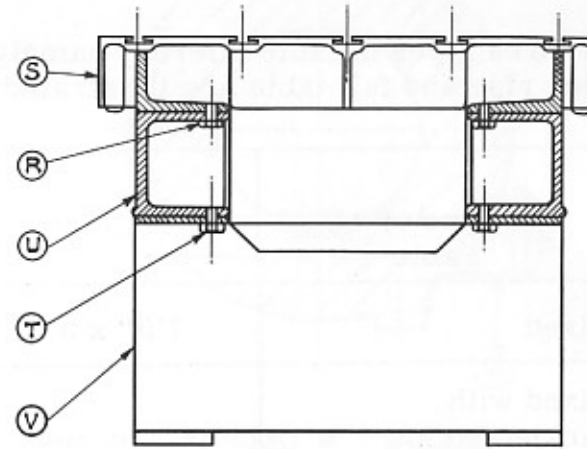


FIG. 16 SECTION THROUGH FIXED TABLE WITH PACKING STRIPS.

POWER RISE AND FALL TABLE (See Fig. 17).

Rise and fall movement is obtained by operating the push buttons. If required the table height can be set by hand. A swingover cover at the front of the table protects a slot through which a crank handle can be inserted and fitted on the end of the motor spindle extension. Manual operation is shown in Fig. 18. The two table slide locking handles should be released whilst raising or lowering the table, but make sure the slides are locked before routing is started. Troughs are provided at both ends of the table to collect the coolant fluid which should be drained off by opening the taps fitted.

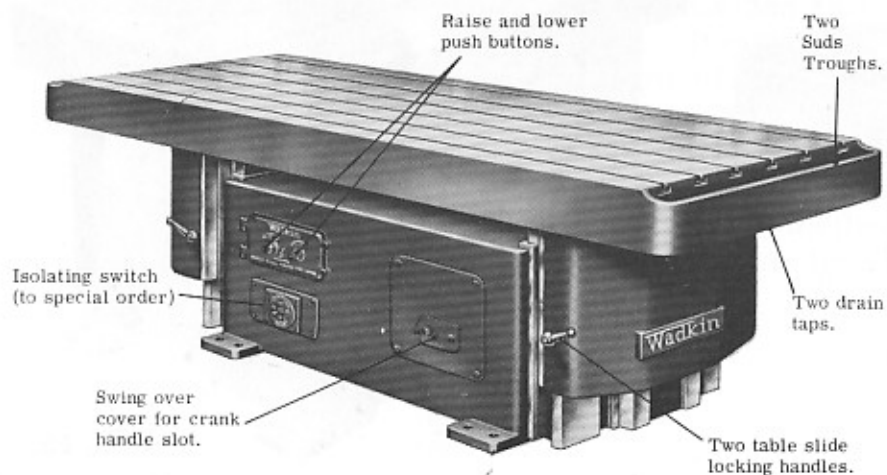


FIG. 17. POWER RISE AND FALL TABLE.

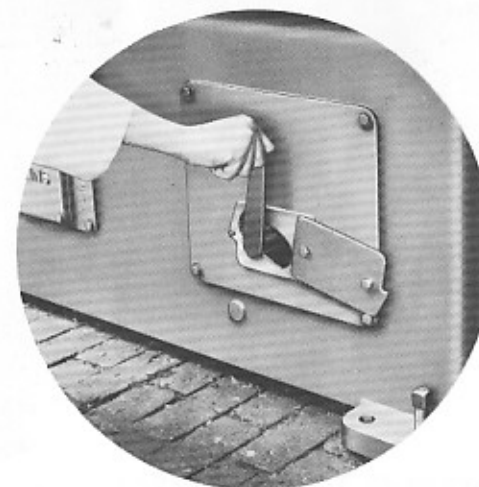


FIG. 18. MANUAL OPERATION.

BASE PLATE (TO SPECIAL ORDER)

Fig. 19 shows the base plate which should be used when machining castings too deep to accommodate on the tables offered.



Fig. 19

SUDS MIST EQUIPMENT (TO SPECIAL ORDER)

The equipment shown in Fig. 20 is recommended for lubricating the cutter on high speed routing or milling work. It ensures wet cutting without any of the disadvantages usually associated with ordinary suds pump and fittings. A shop air line giving approximately 80 lbs/square inch (5.62 kilograms/square centimetre) is necessary for operating this equipment. Flow of air is controlled by a tap fitted to the inlet on top of the pressurised suds container. The air pressure entering the container is the same as the air pressure to the mixing valve. To vary the air pressure wind the tee screw in or out until the required pressure is shown by the dial indicator. A tap is fitted on the mixing valve to regulate flow of pressurised suds for jet delivery through either one or three nozzles.

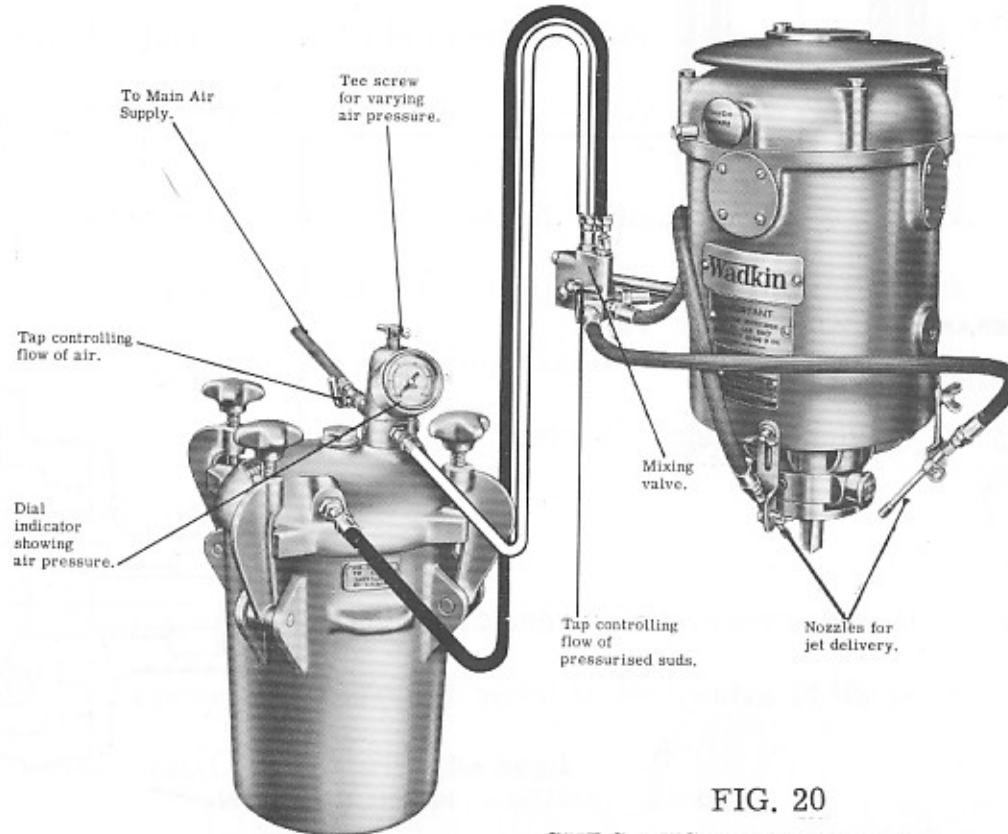


FIG. 20
SUDS MIST EQUIPMENT.

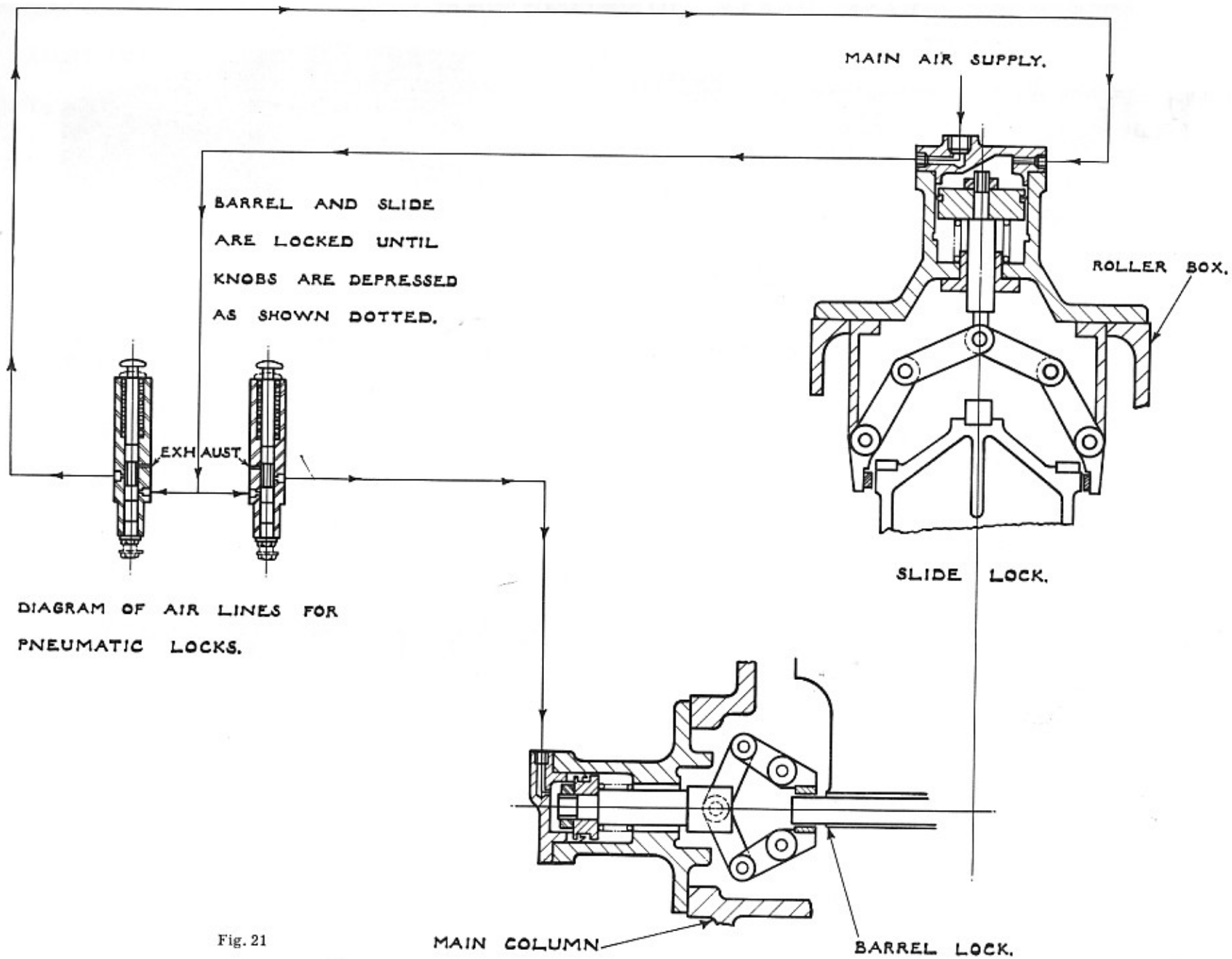


Fig. 21

PNEUMATIC SLIDE LOCK AND PNEUMATIC BARREL LOCK
(TO SPECIAL ORDER ONLY)

The pneumatic slide lock and pneumatic barrel lock are used to prevent movement of the arm when routing. The pressure cylinder for the slide lock is fitted on top of the roller box whilst the pressure cylinder for the barrel lock is fitted on the side of the main column. A $\frac{1}{2}$ " (13mm) gas hole is provided in the pneumatic slide lock cylinder for the customer to fit his own air inlet. Air pressure of 80 lbs/square inch (5.62 kilograms/square centimeter) is required.

The diagram at Fig. 21 shows the air lines as for independent operation of the locks. For each lock a lever and Bowden cable are used to operate the pressure valve controlling valve of air to the lock. The lever for the slide lock is mounted on the left arm of the operating handle and the lever for the barrel lock on the right arm. If desired the locks can be arranged to operate simultaneously by using a single valve. The locks can also be supplied separately.

An example of the usefulness of the slide lock is when pocketing operations are carried out on an airframe component. With the lock applied it is possible to remove metal in the centre of the pocket, where a guide plate cannot be used, by making radial sweeps with the head.

ELECTRICAL INSTALLATION INSTRUCTIONS.

Fit a 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 line supply cables to the isolating switch through conduit which should be screwed into the machine and secured by means of locknuts. Connect the frequency changer to the terminal blocks in the contactor cavity as follows :-

1. Drive motor at terminals A3 - B3 - C3.
2. Slip rings at terminals A - B - C.
3. Stator at terminals D - E - F.

Ensure that the direction of rotation is correct before putting the machine into operation, to reverse rotation interchange L1 and L3 at isolating switch.

OPERATING INSTRUCTIONS.

To start machine close isolating switch, turn speed selector switch handle to the 'LOW' position and press the "start" button, if the high speed is required turn speed selector switch to the 'HIGH' position after full speed has been reached in the 'LOW' position.

NOTE:- Always start the machine in low speed.

To stop machine press the stop button. To lock off machine, press and half turn the stop button, this must be released before a start can be made.

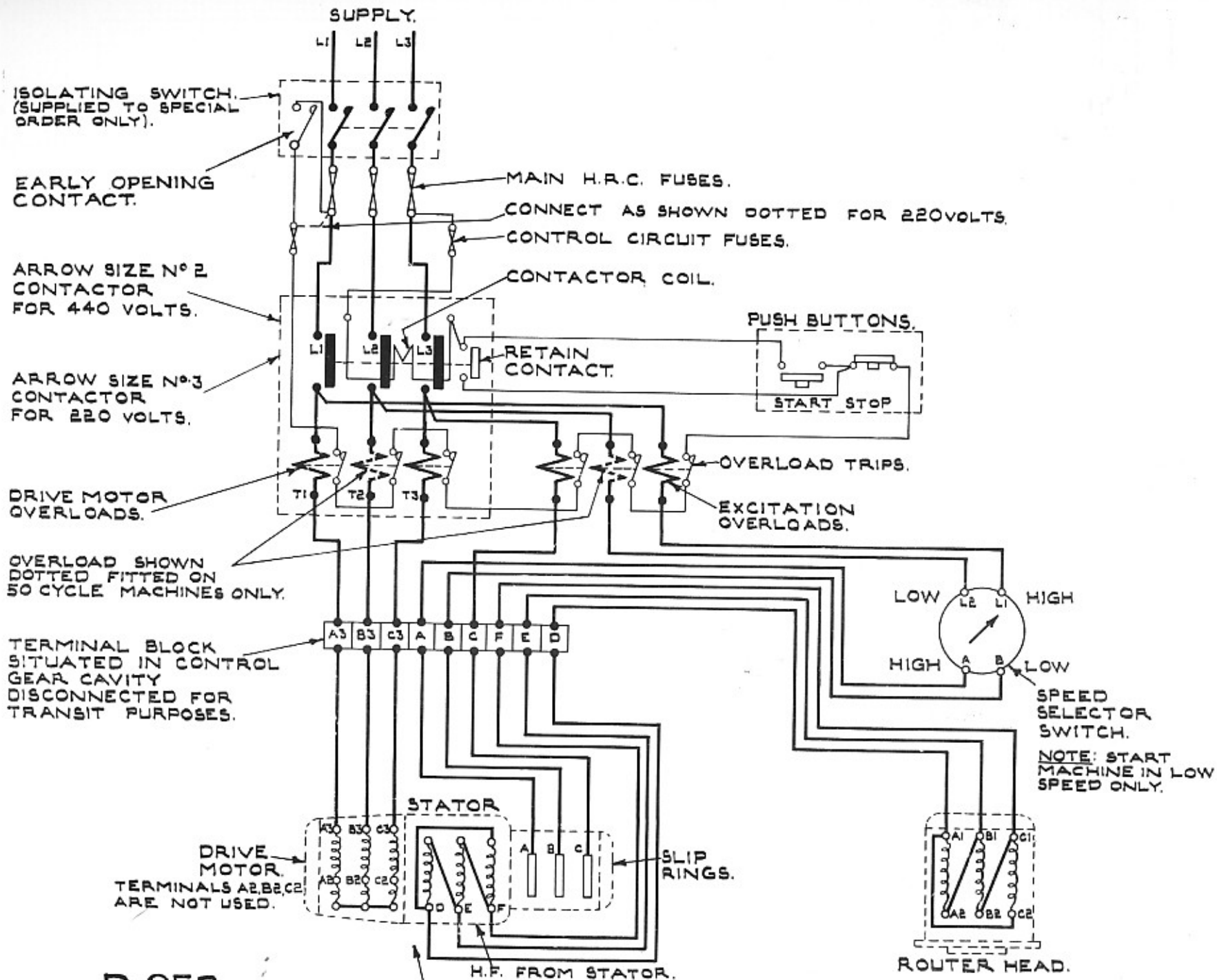
OVERLOAD.

Should the machine stop due to overload, wait for a short time to allow the heater coils to cool then start in the usual manner. The overloads are set at these Works at 'AUTO' for automatic reset after tripping, if set at 'HAND' the plunger on the overload assemblies must be depressed to reset.

GENERAL.

Check earth connection from time to time.

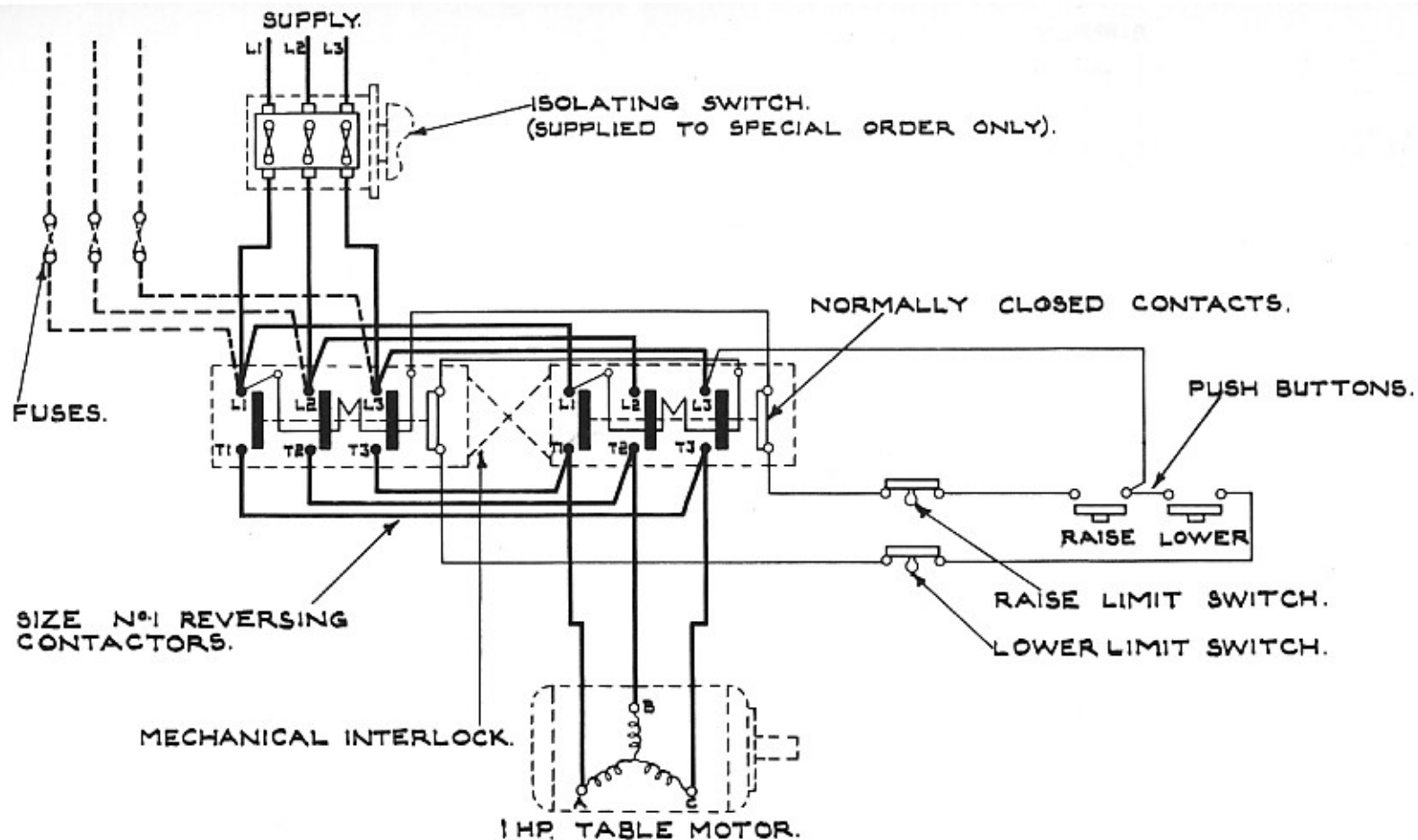
Users are recommended to display in an appropriate position in the maintenance department Wadkin Electrical Maintenance Instruction Card No. 356 which is issued gratis on application.



D. 952.

11/8 KW FREQUENCY CHANGER SET.

SELECTOR SWITCH CONNECTIONS.
 'HIGH' CONNECTS L1 TO B, L2 TO A.
 'LOW' CONNECTS L1 TO A, L2 TO B.



INSTALLATION INSTRUCTIONS.

FIT ISOLATING SWITCH NEAR MACHINE 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 FRAME AND SECURED BY MEANS OF LOCKNUTS. ENSURE THAT THE DIRECTION OF ROTATION IS CORRECT BEFORE PUTTING THE MACHINE INTO SERVICE, TO REVERSE ROTATION INTERCHANGE L1 AND L3 AT ISOLATING SWITCH.

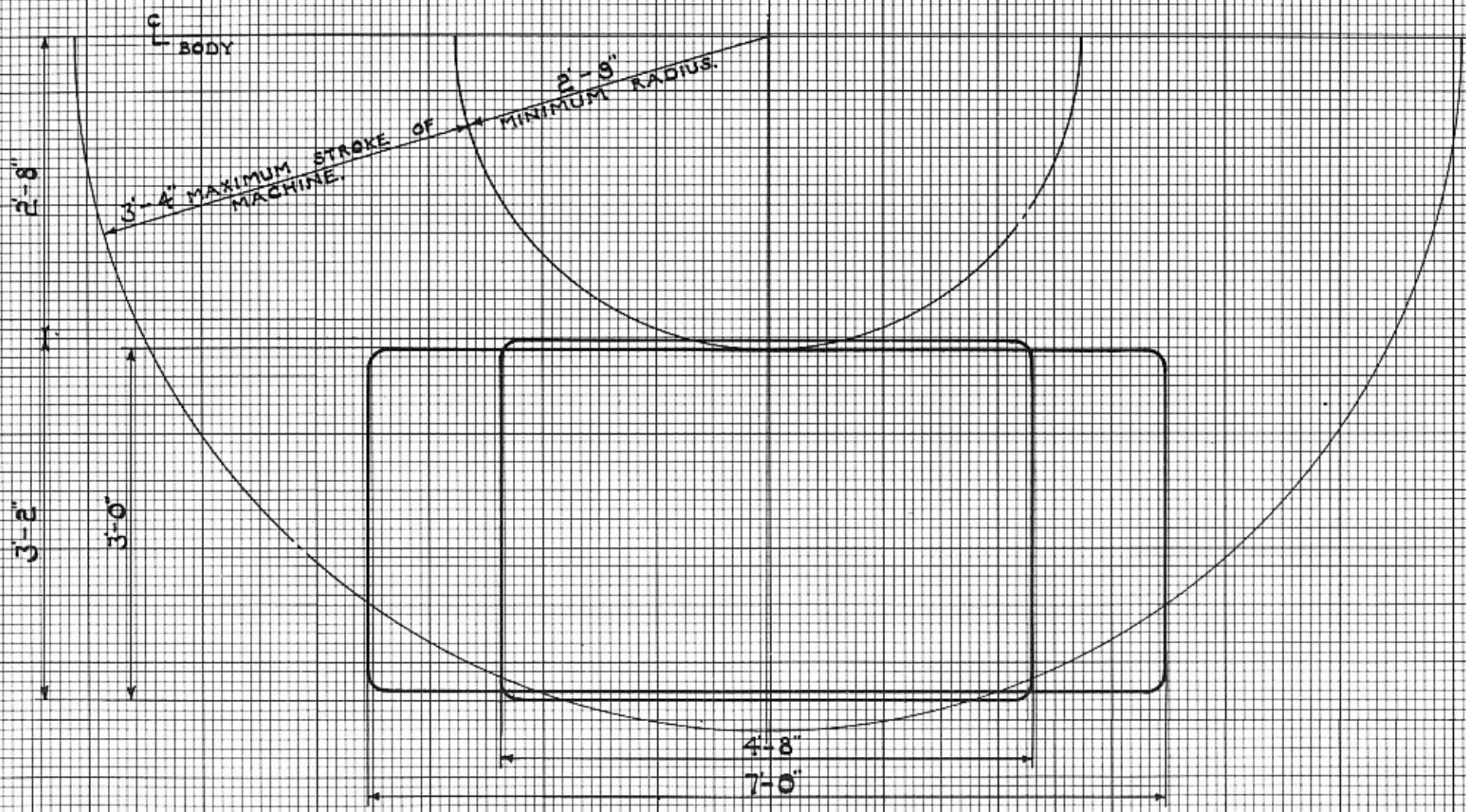
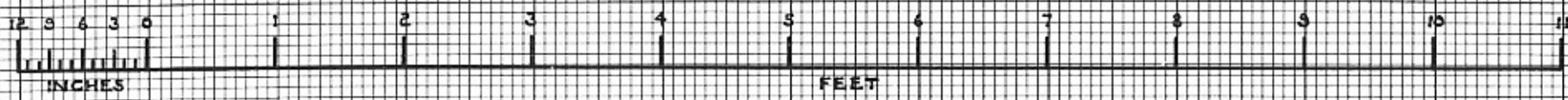
OPERATING INSTRUCTIONS.

TO OPERATE THE TABLE: CLOSE ISOLATING SWITCH AND HOLD 'RAISE' OR 'LOWER' BUTTON DEPRESSED AS REQUIRED. TO STOP THE TABLE: RELEASE THE BUTTON.

NOTE:

FUSES SHOWN DOTTED ARE FITTED WHEN THE TABLE IS SUPPLIED WITH A MACHINE.

WIDTH	STRIP	6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-3"
LENGTH		10'-9"	10'-3"	9'-6"	8'-6"	7'-6"	6'-0"	5'-0"



BLOCK AND STRIP CAPACITY CHART—H Y R