

Wadkin

Double End Tenoning Machine

TYPE W.A.

This machine will cut the tenons, scribe the shoulders and cut off accurately to length both ends of material at one operation.

It is also suitable for cutting double tenons, top and bottom scribing, cross cutting and squaring panels.

The machine is available in two sizes to take sections of 24" x 4½" or 60" x 4½" thick.

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GENERAL VIEW OF 24" MACHINE

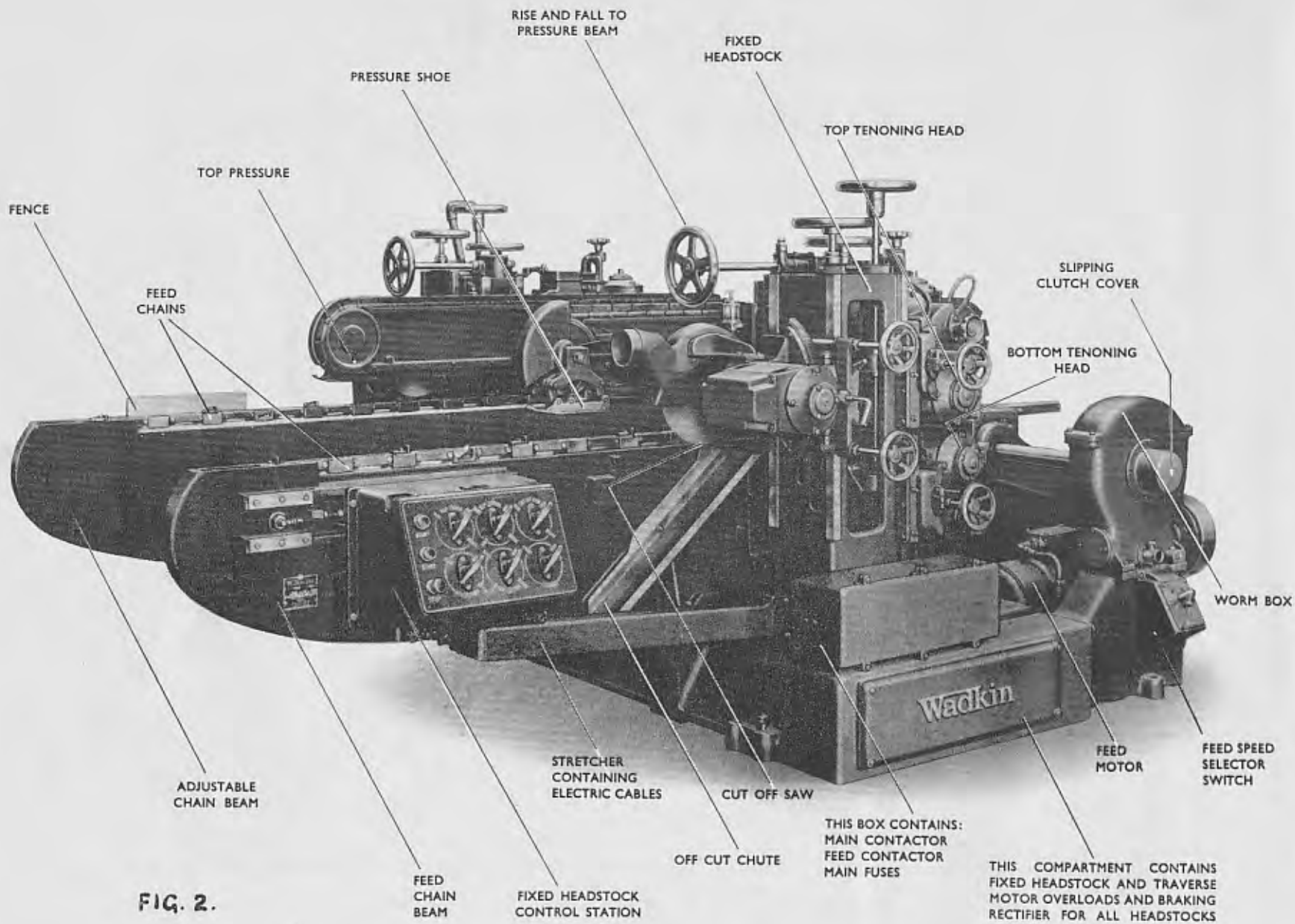


FIG. 2.

DIMENSIONS AND CAPACITIES

Maximum length between shoulders	7' 10"
Minimum length of material cut between shoulders	...	...	...	...	...	...	...	...	...	6"
Maximum length of tenon	...	...	...	...	...	...	...	...	...	6"
Maximum length of material (cross cutting only) between saws	...	...	...	...	...	...	...	...	...	8' 3"
Minimum length of material tenoned between shoulders	...	...	...	...	...	...	...	...	...	6"
Diameter of cut off saw	...	...	...	...	...	...	...	...	...	14"
Cut off saw will cant	...	...	...	...	...	...	...	...	...	45° up or down
Rates of feed	...	...	...	...	...	...	...	...	...	10-11-12-14-17-19-21-25-28-30 feet per minute
Height of table from floor	...	...	...	...	...	...	...	...	...	3' 0"
Horse-power and speeds of heads :—										
Horizontal heads, 5 h.p.	...	...	...	...	...	...	...	...	...	3,000 r.p.m.
Scribers, 5 h.p.	...	...	...	...	...	...	...	...	...	3,000 r.p.m.
(and 6,000 r.p.m. if high frequency equipment is ordered with machine).										
Saws, 5 h.p.	...	...	...	...	...	...	...	...	...	3,000 r.p.m.
Horse-power and speed of variable speed motor	...	...	...	...	...	...	...	...	...	3 h.p., 500 to 1,500 r.p.m.
Power traverse to headstock	...	...	...	...	...	...	...	...	...	1½ h.p.
APPROX. NETT WEIGHT	...	...	...	...	...	...	...	...	...	24" MACHINE 5½ tons,
APPROX. NETT WEIGHT	...	...	...	...	...	...	...	...	...	60" MACHINE 6 tons.

FOUNDATION PLAN FOR 24" MACHINE

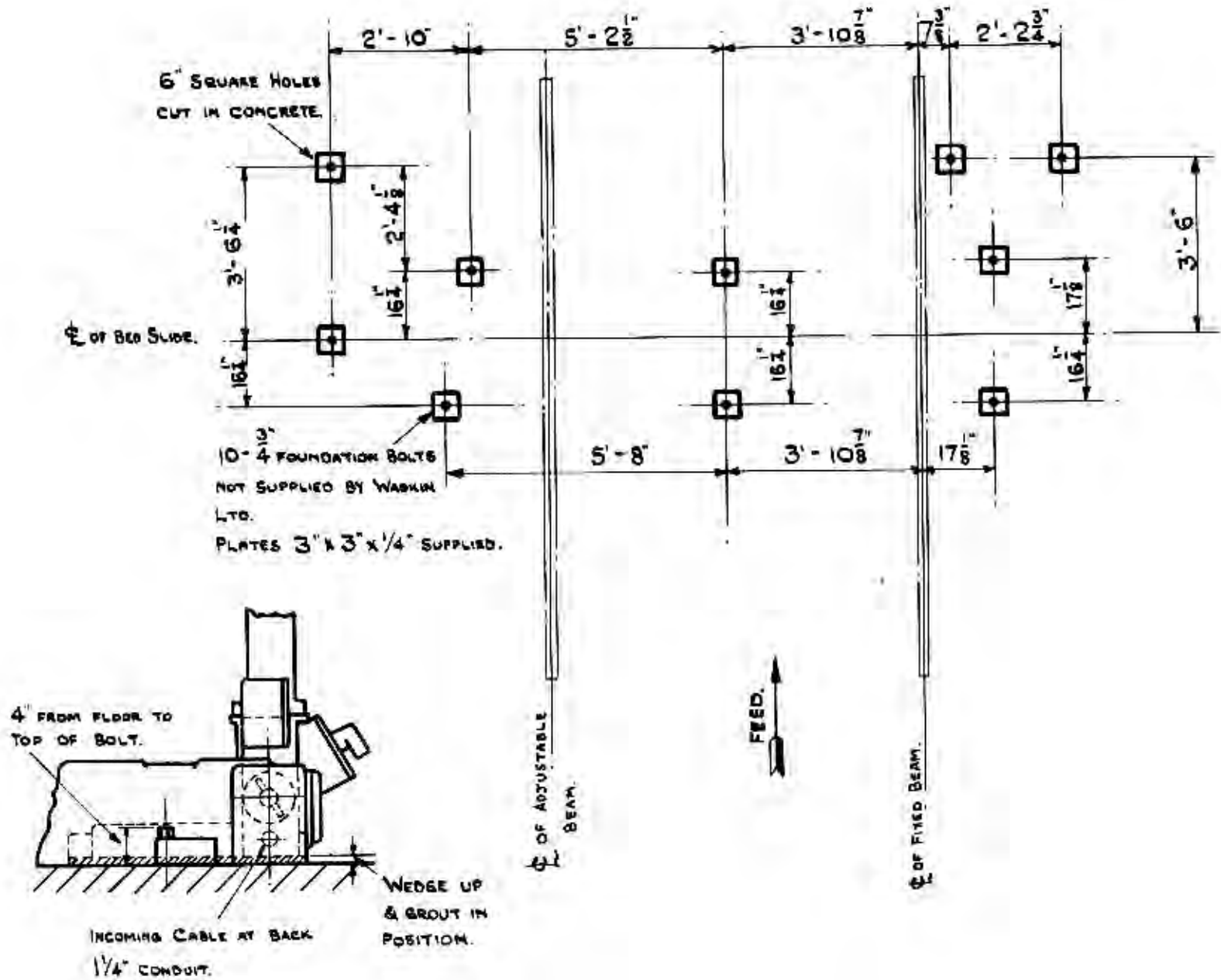


FIG. 3.
Page 4

FOUNDATION PLAN FOR 60" MACHINE

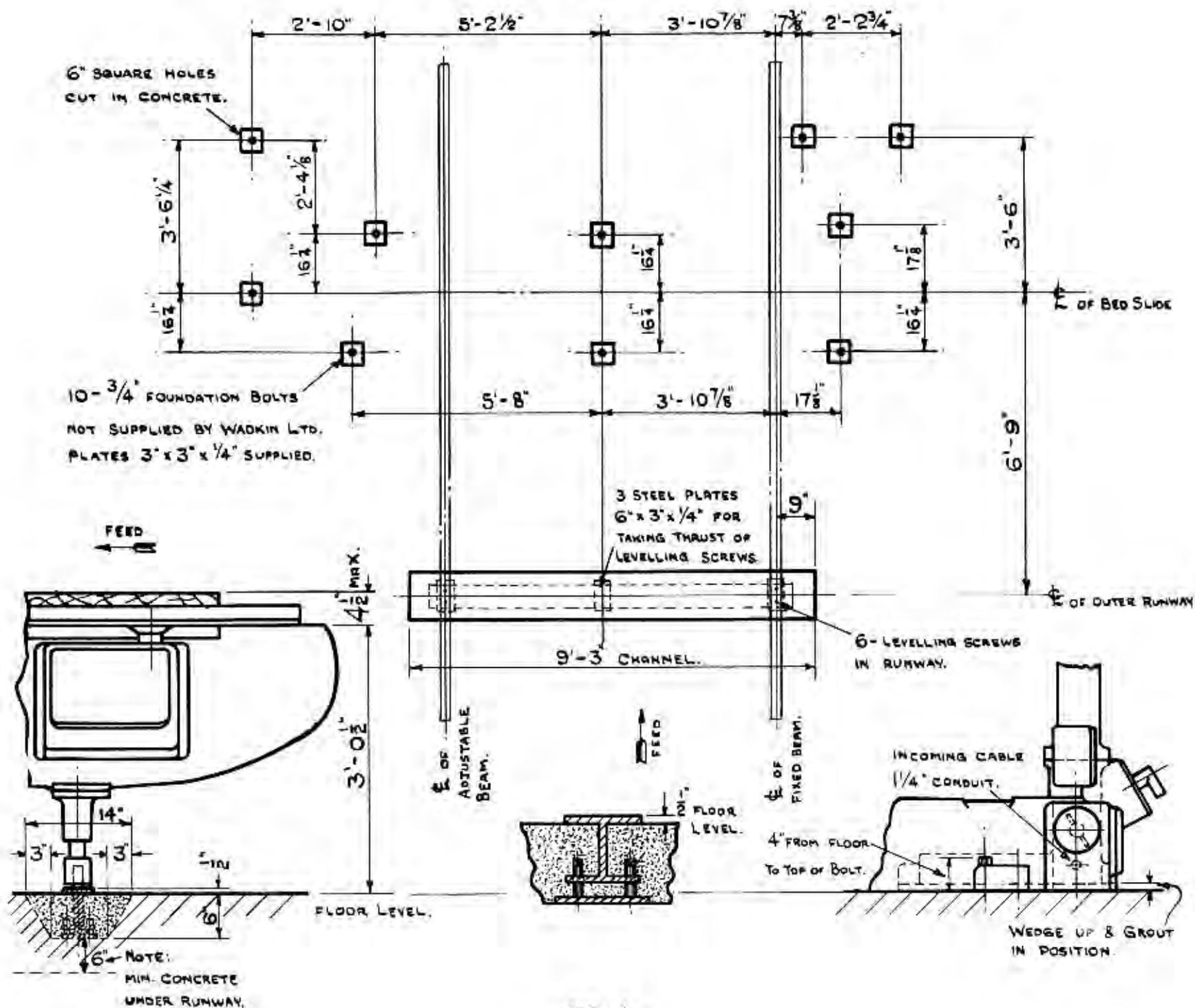


FIG. 4.
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INSTALLATION

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

FOUNDATION

$\frac{3}{4}$ " foundation bolts should be used for holding the machine down to the floor, square head setting screws are provided and also $3" \times 3" \times \frac{1}{4}"$ steel plates. These plates should be placed on the floor underneath the setting screws and the whole machine raised and packed $\frac{3}{4}"$ above floor level and levelled with the aid of the setting screws. The feed motor and worm box housing should be wedged up $1\frac{1}{4}"$ above floor level and grouted in position with the machine. If mill floor consists of 6" solid concrete, no special foundation is necessary. Rag type foundation bolts may be used and 6" to 8" square holes cut in the concrete; then grout in the machine with liquid cement after it has been carefully levelled.

An outer runway for the chain beam is fitted on the 60" machines. As shown on the foundation plan, a channel must be excavated in the floor to allow the runway to fit in with the top face protruding $\frac{1}{2}"$ above the floor level. The runway is levelled up with six square head setting screws resting on three steel plates and then grouted in the channel with liquid cement. It should be checked that 6" of concrete is available in the foundation under the runway, and care should be taken when levelling up to pack underneath the two points where the supports from the beams touch the runway, to prevent any possibility of sagging at these two positions.

WIRING See page 31 for electrical installation instructions.

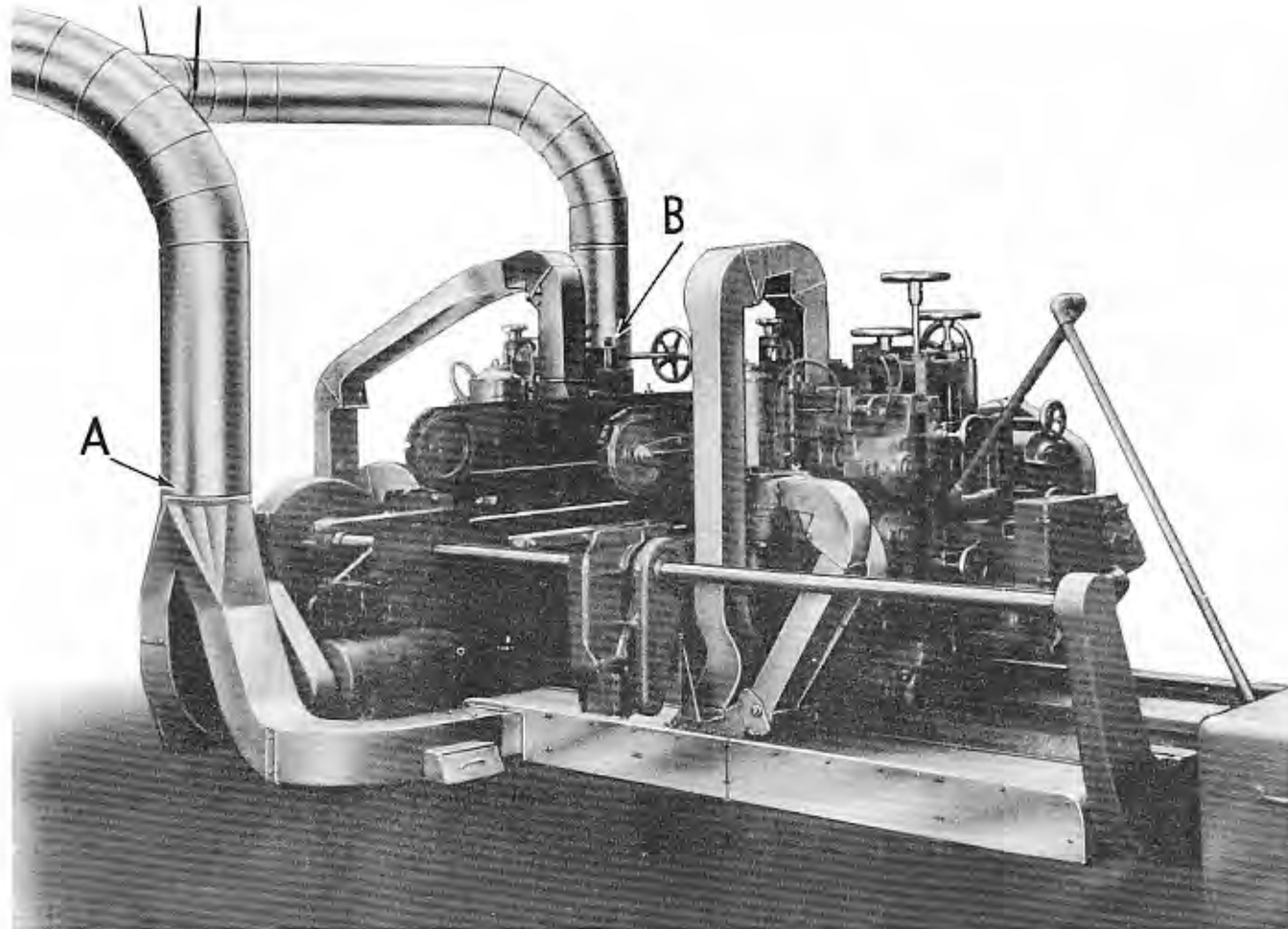


FIG. 5.

DUST EXHAUST SYSTEM

All cutter heads are fitted with an efficient exhaust hood for the speedy removal of chips and sawdust. The scriber hoods are adjustable for length of tenon, the top tenon hood is adjustable with the pressure, and the bottom tenon hood is fixed. A complete set of trunking has been designed for this machine, as shown in Fig. 5 above. This trunking can be supplied to special order. Using the recommended trunking system the main outlet should be connected to a 13" bore pipe at "A" and an 11" bore pipe at "B," Fig. 5. The cut off saw exhaust hood has a $4\frac{1}{2}$ " diameter spigot for the outlet. The scriber heads have a rectangular outlet 5" wide \times $3\frac{3}{4}$ " deep. The top tenon outlet is $5\frac{3}{4}$ " wide \times 5" deep. The bottom head hood has an exhaust opening $10\frac{3}{8}$ " wide \times 5" deep with a facing 6" wide \times $12\frac{1}{8}$ " deep. Chutes are provided underneath the cut off saws for removing the off-cuts.

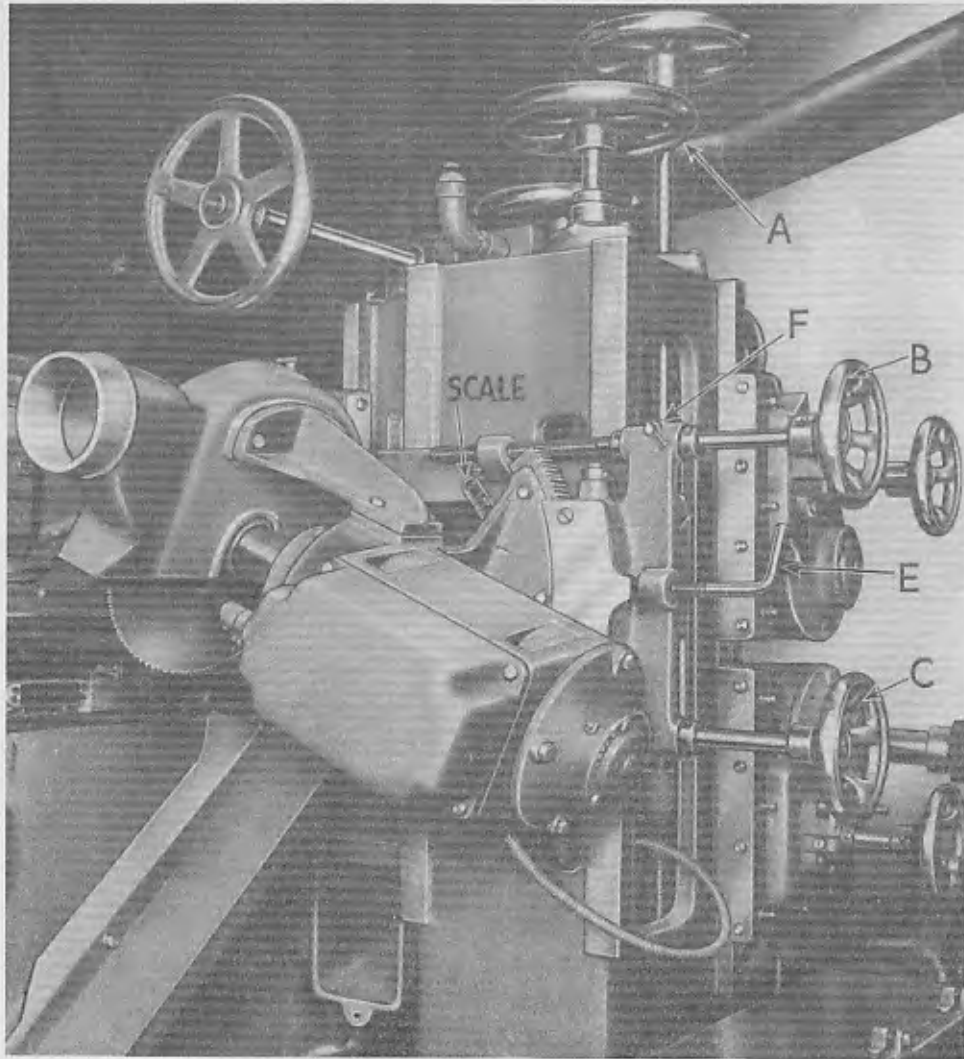


FIG. 6.

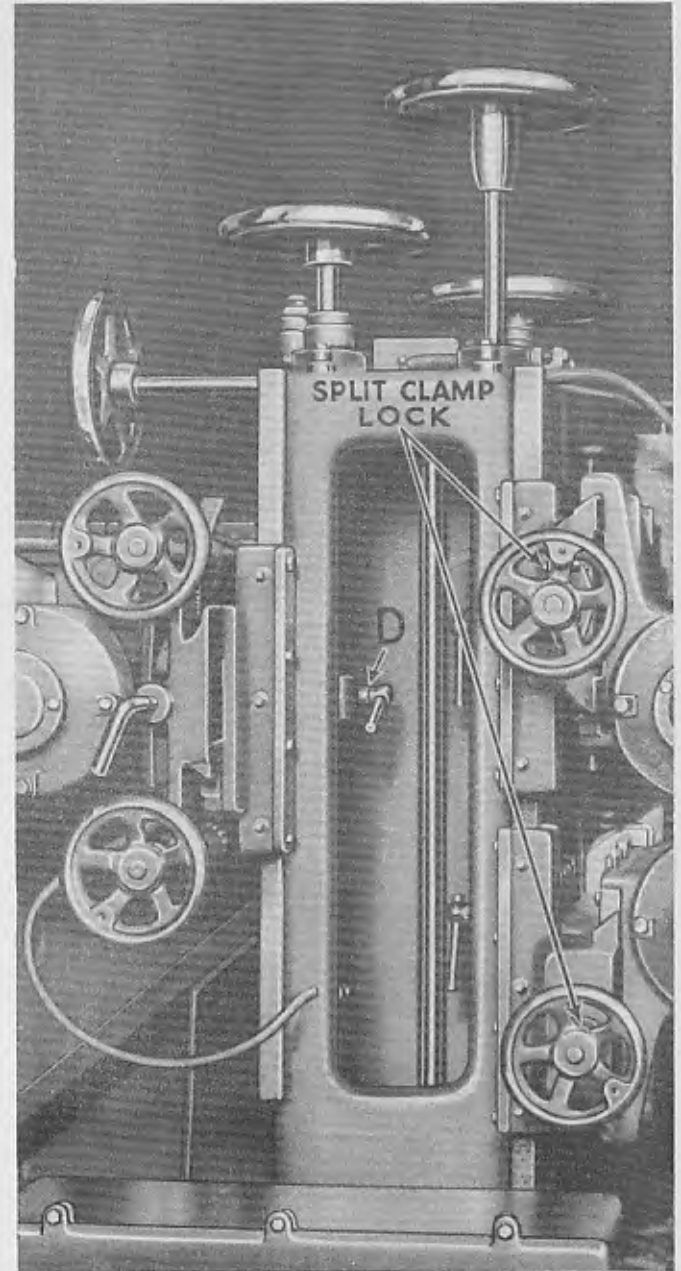


FIG. 7.

HEADSTOCK ADJUSTMENTS

CUT OFF SAW

The cut off saw is shown in Fig. 6. The top handwheel "A" is used for raising and lowering the complete saw carriage. This movement enables saws to be used above or below the timber level. Handwheel "B" is rotated to move the spindle unit in a horizontal direction, either towards the timber, or away from it, while the third handwheel "C," operates the canting motion to enable the saw to swivel 45° up or down.

The whole saw carriage is locked from vertical movement, with the handle "D," Fig. 7, situated inside the headstock casting.

The handle "E," Fig. 6, locks the spindle canting movement.

The clamp lever "F," Fig. 6, clamps the saw carriage for horizontal movement.

A graduated scale is fitted, to give direct angular reading of the saw carriage as shown on Fig. 6.

The saw is mounted direct on the spindle as shown in Fig. 8. It is driven by the driving pin and supported by 3" diameter saw collars; the saw and collars are locked up against the spindle shoulder with two hexagon locknuts.

The tommy bar holes are provided on the spindle shank, to facilitate holding the spindle when locking or unlocking the hexagon nuts.

By removing the loose centre saw collar, hogging saws can be fitted, for reducing the cut-off portion of stock to sawdust or refuse.

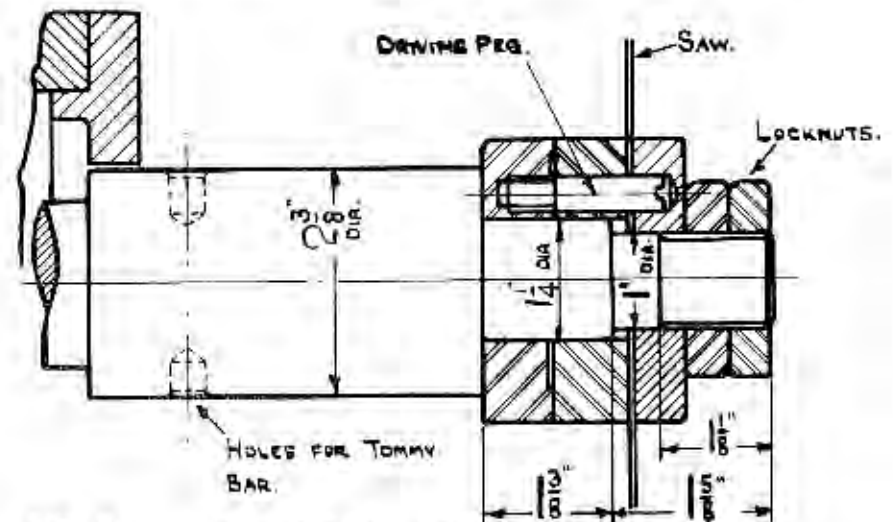


FIG. 8. CUT OFF SAW - SPINDLE END.

HEADSTOCK ADJUSTMENTS (Continued)

TOP TENONING HEAD

The top tenoning head carriage is moved vertically by rotating the handwheel "A," Fig. 10. Horizontal adjustment towards or away from the timber is provided by rotating handwheel "B," Fig. 10. The locking handle "C," Fig. 10, inside the headstock casting provides the vertical lock for the carriage. The horizontal adjustment is locked with the split clamp lever situated behind the adjusting handwheel, Fig. 7. If specially ordered with the machine the tenoning heads can be arranged to cant 10° either way with the scribing heads.

BOTTOM TENONING HEAD

The bottom tenoning head carriage is mounted on the same vertical headstock slide as the top head, the handwheel shown at Fig. 10 controlling the rise and fall movement. A lock is provided at "D" for this motion. The cross adjustment is obtained by rotating the handwheel "E." This adjustment is locked with a lever operating a split clamp as shown at Fig. 7. Graduated rules are provided on the headstock for setting both top and bottom tenoning heads horizontally, the pointer being mounted on the cutter spindle carriage.

SPINDLE ENDS

The method of mounting the cutter blocks is shown in Fig. 9. The blocks are driven with the key and locked in position with the hexagon nut. A special box spanner for locking this nut is supplied with the machine. Two tommy bar holes are situated on the spindle shoulder behind the blocks for holding the spindle when locking the nut.

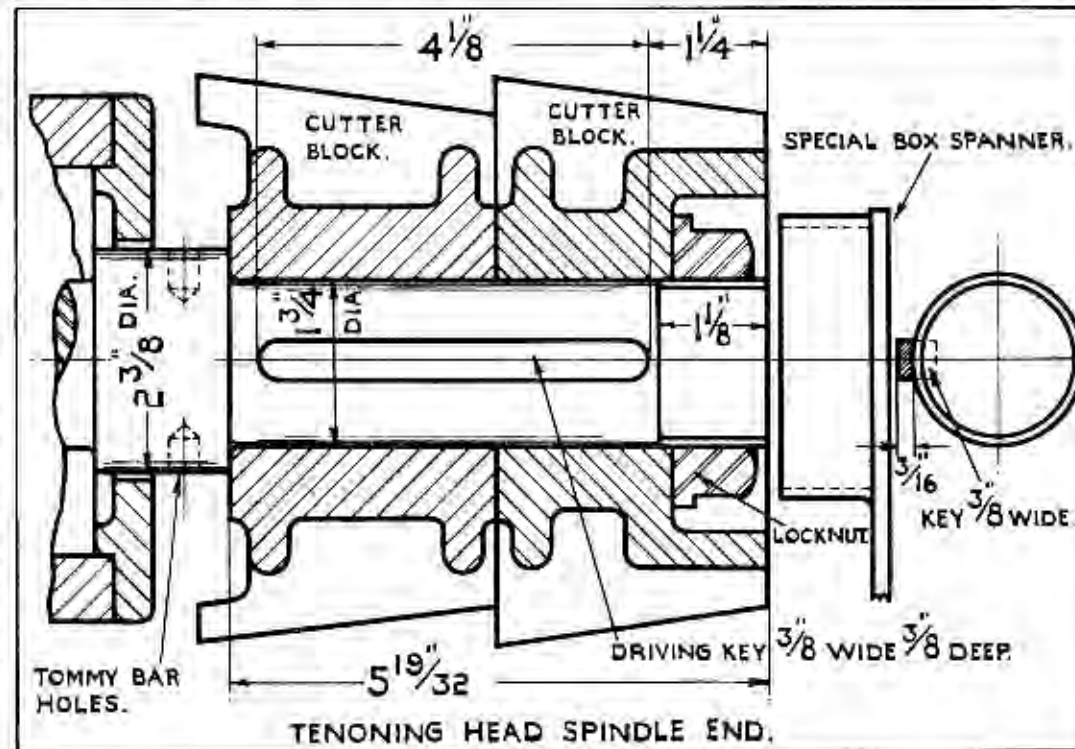


FIG. 9

HEADSTOCK ADJUSTMENTS (Continued)

TOP SCRIBING HEAD

The top scribing head is carried on a slideway fixed to the top tenoning head and will therefore move up and down with the adjustment to the tenoning head as shown in Fig. 10. Further vertical adjustment to the cutter head is obtained by rotating the small handwheel "G." The tee-shaped handle on the boss under this handwheel locks the spindle head in its vertical position. The whole carriage is locked automatically with the tenoning head. Cross adjustment to the spindle carriage is obtained by rotating the handwheel "F." The clamp lever on the boss behind this handwheel locks the spindle carriage cross movement.

BOTTOM SCRIBING HEAD

The bottom scribing head is in all respects mounted and operated similar to the top head. Its main adjustment is taken from the bottom tenoning head, with further vertical adjustment to the head taken from the handwheel "H." This movement is locked with the tee shaped handle above the handwheel.

Cross adjustment is provided by rotating handwheel "J," and locked with the lever behind this wheel.

SPINDLE ENDS

The scribing cutter blocks are mounted direct on the cutter spindle as shown in Fig. 11, and driven with the key. They are locked in position with the lock-nut.

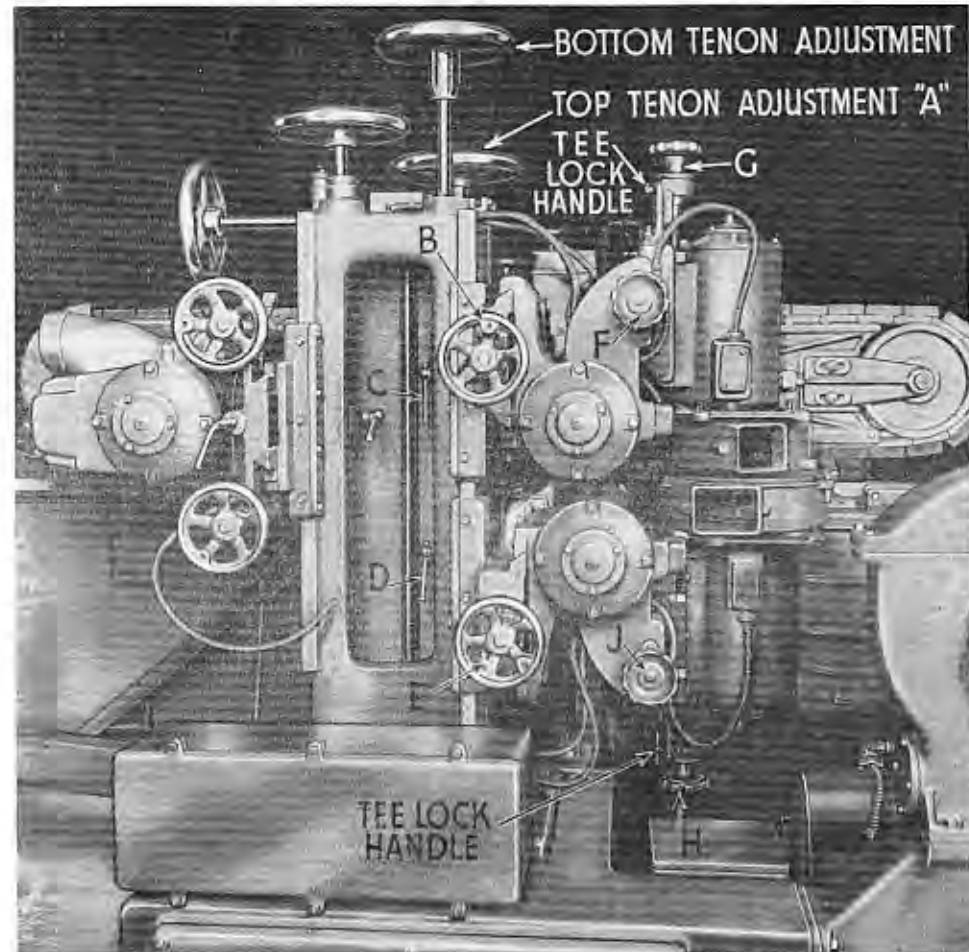


FIG. 10.

SPINDLE ENDS (continued)

The block is recessed to take the nut and a special box spanner is provided with the machine for locking this nut. A tommy bar hole is drilled through the cutter spindle on the end opposite to the cutter block, to hold the spindle when locking or unlocking the cutterblock nut.

NOTE.—The method of adjusting and operating the cutterheads on both fixed and moveable headstock is identical, and the foregoing instructions refer to both.

PRESSURES

METHOD OF OPERATING The caterpillar type top pressure is generally illustrated at Fig. 2, and the method of operating is identical on both fixed and adjustable headstocks.

The pressure beam is mounted on a slide bracket and moves up or down the headstock slideway. The handwheel shown in Fig. 2 is rotated for the rise and fall movement. At the feeding in end of the pressure beam a spring loaded pressure shoe is fitted, Fig. 13, and being pivotted on the pressure beam, moves up and down with the beam for initial setting. The spring in the shoe allows for variation in timber thickness when feeding. A scale is provided on the headstock for vertical adjustment.

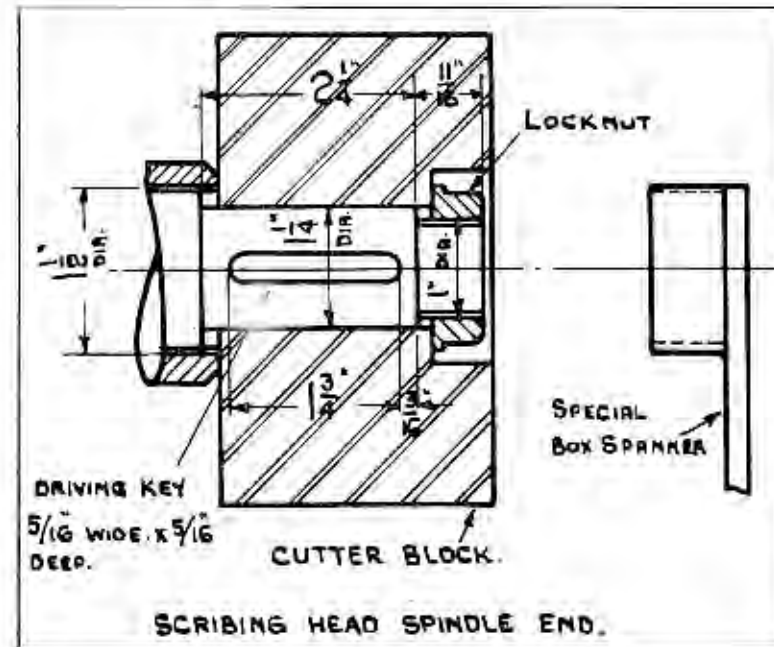


FIG. 11.

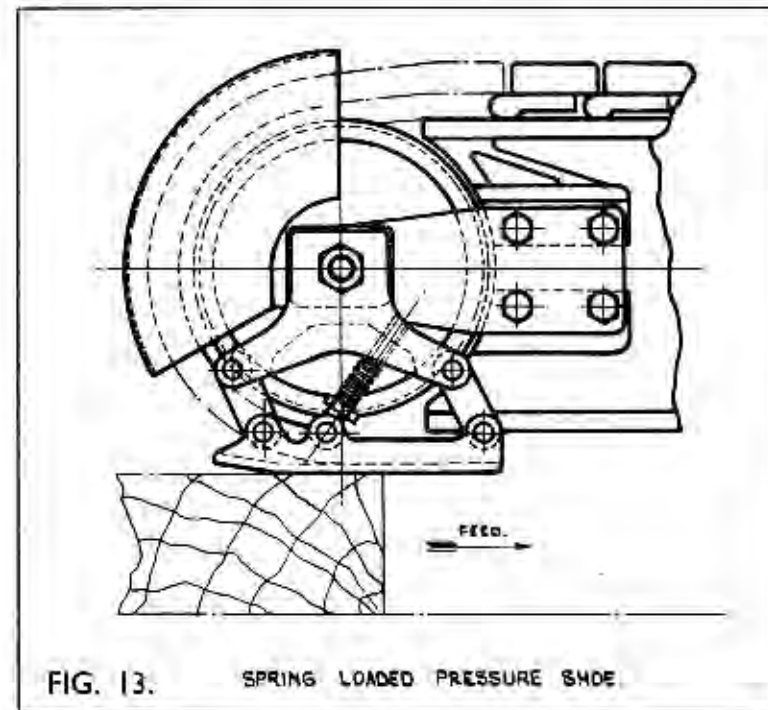


FIG. 13. SPRING LOADED PRESSURE SHOE

FENCE

METHOD OF OPERATING ON 24" MACHINE

The fence is fitted on the adjustable chain beam at the "feeding in" end. Two slide bases are mounted on top of the control box giving two positions to locate the tongue of the fence base. This base is locked in position with handle "B," Fig. 12. The front fence plate is adjustable, two studs sliding in slots in the base being used for locking the plate, which is also drilled and countersunk to take No. 10 woodscrews when wood packing pieces are required.

METHOD OF OPERATING ON 60" MACHINE

A long fence is provided on the 60" machine and is fitted on the control box slide at one end and by a bracket mounted on the adjustable beam at the other end, a locking handle at each end clamping the fence in position. The fence plate is drilled and countersunk for No. 10 woodscrews to enable wooden packing pieces to be fitted. For setting up and cutting short lengths of timber it is advisable to remove the long fence and use the short fence as used on the 24" machine, this fence being also included with the machine.

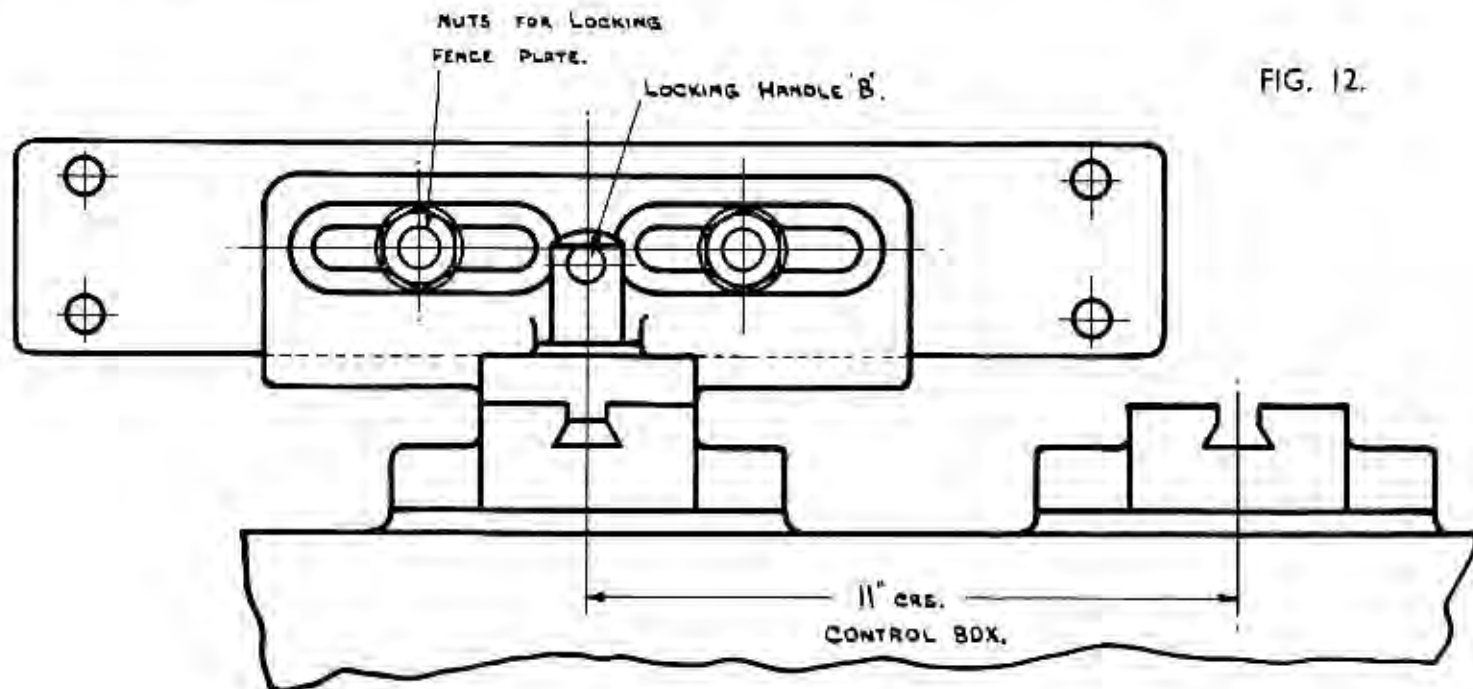
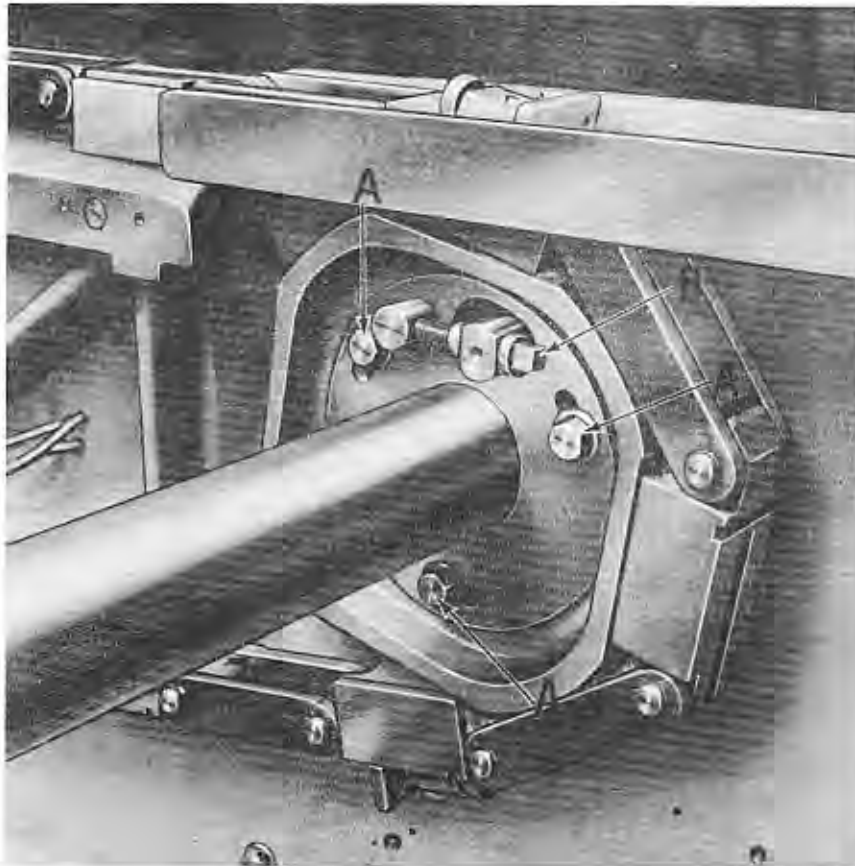


FIG. 12.

FENCE ADJUSTMENT.

FEED CHAIN OPERATION

The complete range of feed dogs for both chains is shown on Page 30 ; one set consists of :—16 fixed and 16 adjustable feed dogs at 16" pitch, 8 disappearing dogs at 5' 4" pitch for a 24" machine, or : 20 fixed and 20 adjustable feed dogs at 16" pitch, 10 disappearing dogs at 5' 4" pitch for a 60" machine. With the exception of the $\frac{5}{16}$ " and $\frac{9}{16}$ " dogs all other sizes are arranged to take backing pieces and are drilled accordingly. After selecting and assembling the feed dogs, Fig. 15, they should be tested for alignment by placing a square on the fence and checking that the dogs on the fixed chain beam are directly opposite and in line with the dogs on the adjustable beam. Slight adjustment can be obtained with the adjusting screw on the adjustable chain feed dogs only, and if further movement is required the whole adjustable feed chain must be rotated without moving the fixed beam chain, as described below.



The driving sprocket on the adjustable beam is mounted on a sleeve and by slackening the bolts "A," Fig. 14, and turning the square head screw "B," the sprocket can be turned round sufficiently to line up the disappearing dogs on the adjustable beam with the fixed chain.

Before operating care must be taken to ensure that the bolts "A" are relocked. When setting up it is often found desirable to move the feed chain without the power motion, and to facilitate this a special tubular box spanner is provided with the machine to fit on the square worm shaft extension. This shaft is shrouded and a compression spring is fitted so that to use the hand traverse the handle must be inserted in the shroud and held against the spring, Fig. 16.

FIG. 14.

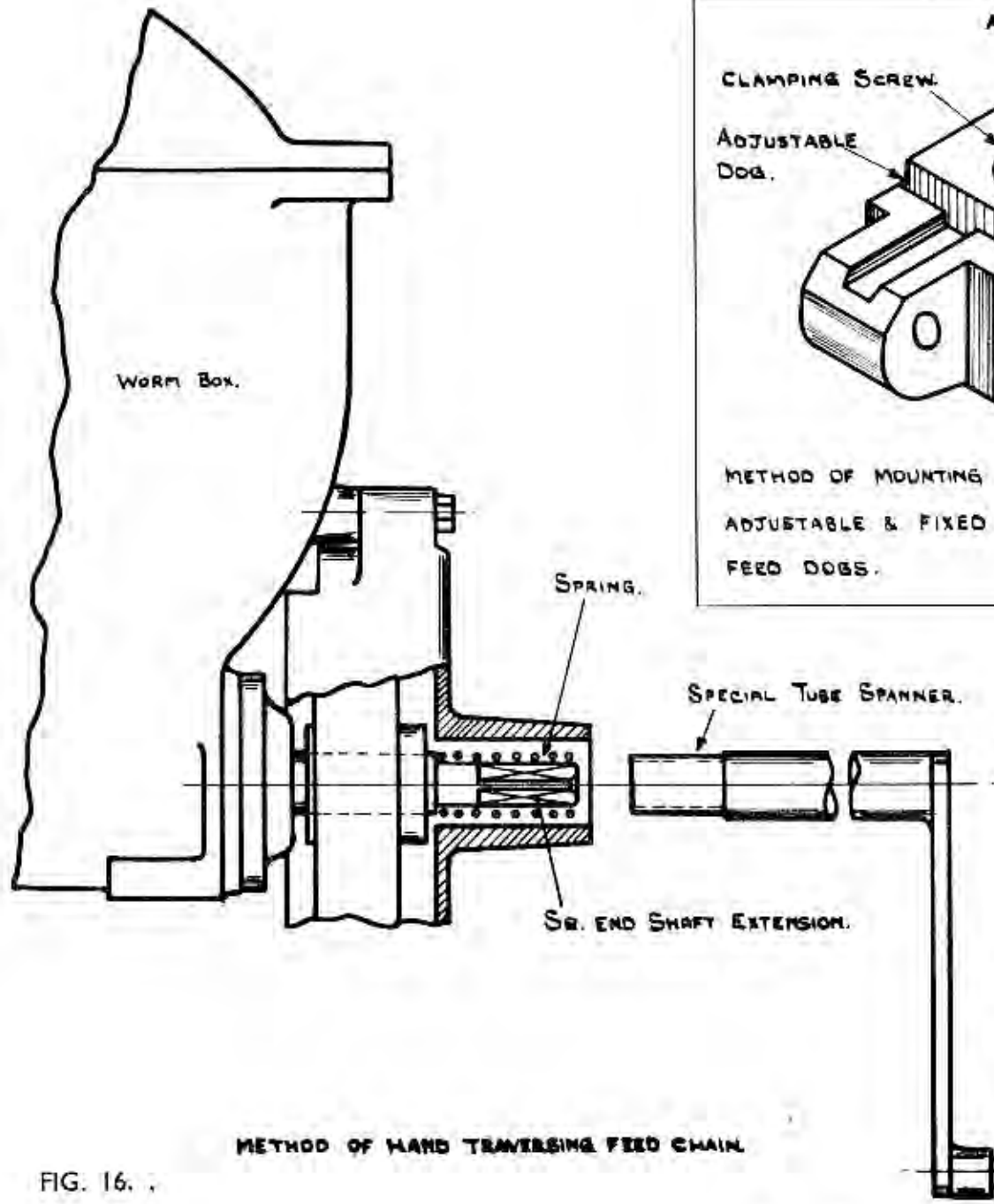


FIG. 16.

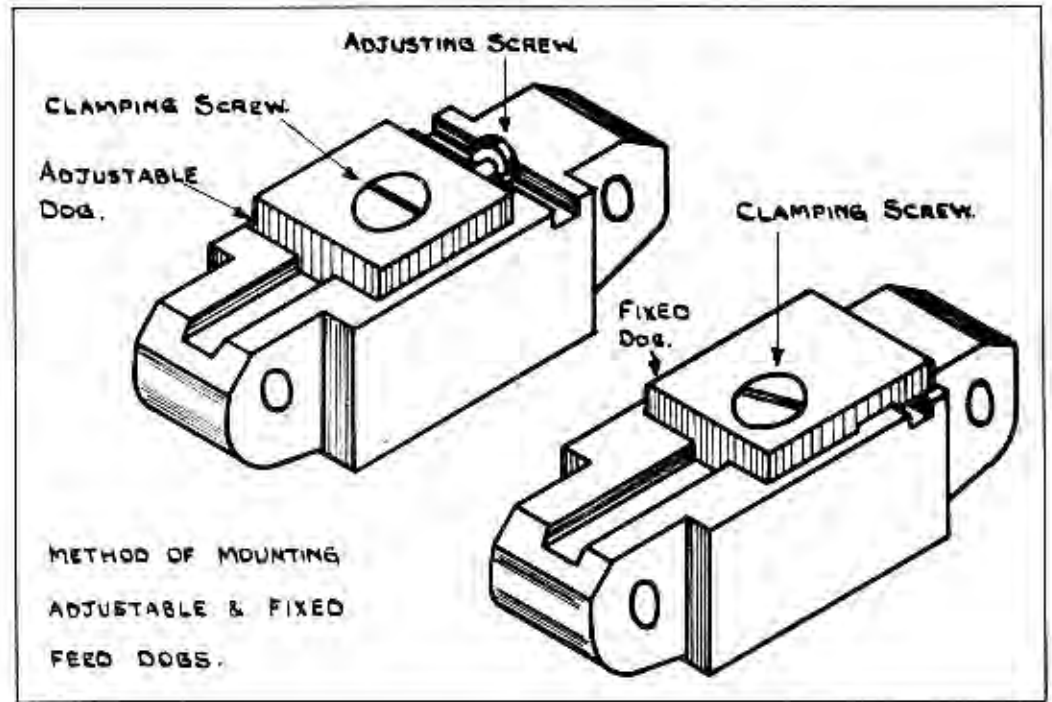


FIG. 15.

OPERATING TRAVERSE MOTION TO ADJUSTABLE BEAM

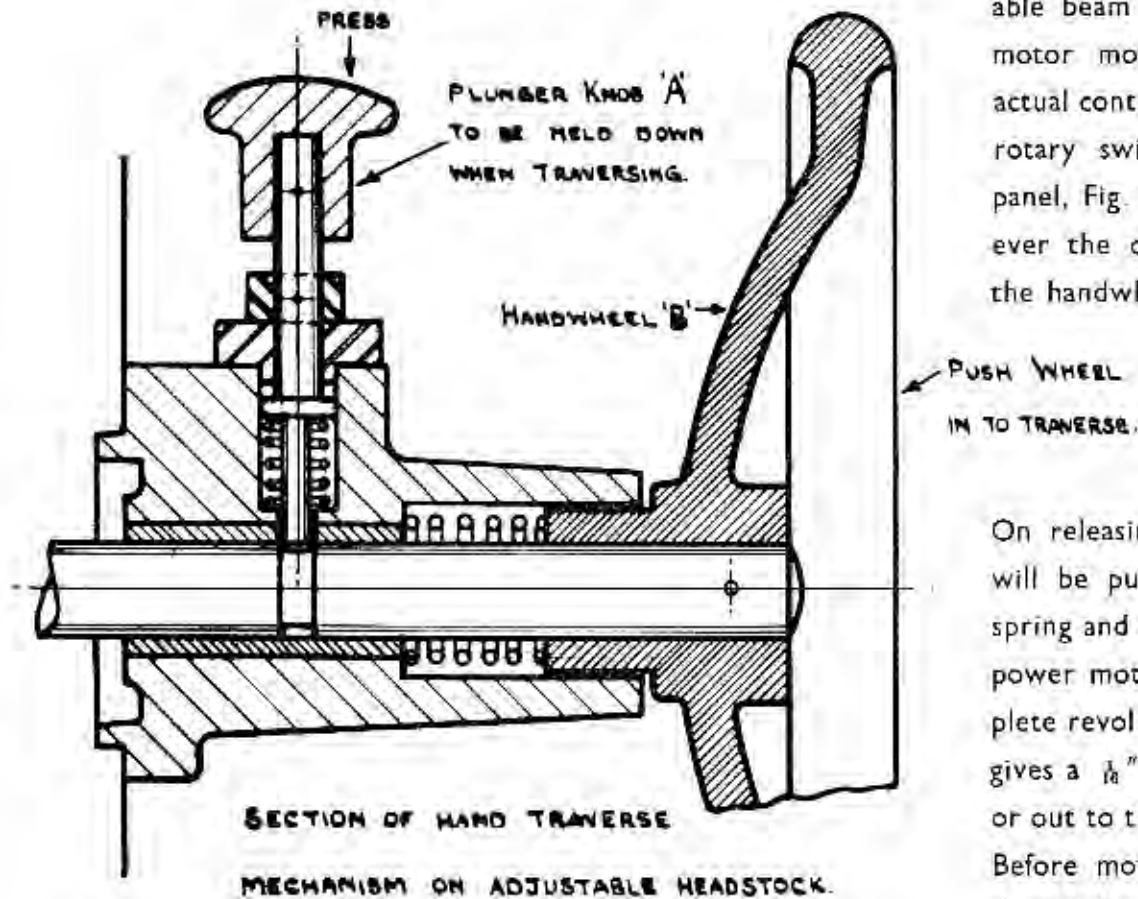


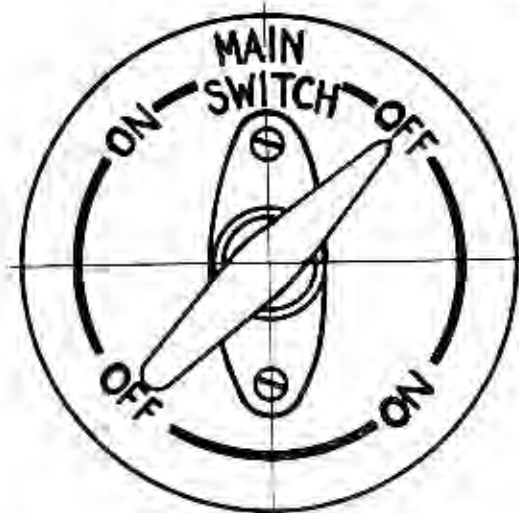
FIG. 17.

The power traverse motion to the adjustable beam is obtained through a $\frac{1}{2}$ h.p. motor mounted on the headstock, the actual control for adjusting in or out is by a rotary switch mounted on the control panel, Fig. 21. For fine adjustment however the carriage can be moved by hand, the handwheel "B," Fig. 17 being pushed in, and the plunger knob "A" must be held down while the wheel is being rotated.

On releasing the plunger the handwheel will be pushed out automatically by the spring and will remain stationary when the power motion is switched on. One complete revolution of the traverse handwheel gives a $\frac{1}{16}$ " horizontal movement either in or out to the adjustable beam.

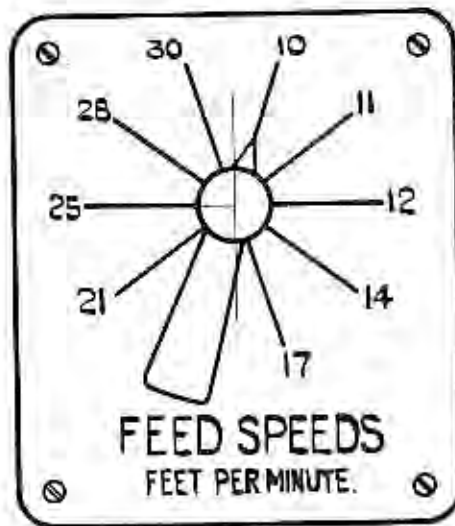
Before moving the adjustable beam, give the hand pump four or five movements of the handle, this provides a film of oil to the bearing surfaces and reduces the effort needed to move the headstock.

OPERATING INSTRUCTIONS FOR ELECTRIC CONTROLS



ISOLATING SWITCH PANEL.

FIG. 18.



FEED SELECTOR SWITCH PANEL.

FIG. 19.

The main isolating switch is situated at the feeding out end of the fixed headstock, underneath the worm box housing.

The switch is engraved as shown in Fig. 18. When the handle is in the "OFF" position the electrical gear is completely isolated, so before any heads, etc., can be started the switch should be turned to the "ON" position.

NOTE.—Neither the feed or the headstock can be started unless all the switches, except main switch, Fig. 18, are in the "OFF" position and the master stop buttons are free.

FEED The feed selector switch is also mounted at the feeding out end of the fixed headstock as shown in the general view of the machine, Fig. 2. The plate is engraved as shown in Fig. 19, with feed speeds ranging from 10 to 30 feet per minute. The pointer on the black handle should be moved to the selected feed. The feed can be altered when the machine is running, care should be taken to ensure that the pointer is on the line so that the switch correctly registers the feed selected.

CONTROL OF FIXED HEADSTOCK The fixed headstock control station is situated on the end of the beam at the "feeding in" end, and is engraved as shown in Fig. 20. When the scribers are to run at 6,000 r.p.m. the first switch to be moved should be the bottom left hand switch marked "CHANGER" which controls the supply of high frequency current necessary to run the scriber cutter spindles at 6,000 r.p.m. The frequency changer is started by turning the switch from "OFF" to "START" and held in that position until the changer motor has gained speed, and then moved to "RUN." To stop the changer turn from "RUN" to "OFF." All the remaining switches control cutter heads and can be started in any order.

OPERATING INSTRUCTIONS FOR ELECTRIC CONTROLS (Cont'd)

CONTROL OF FIXED HEADSTOCK (continued)

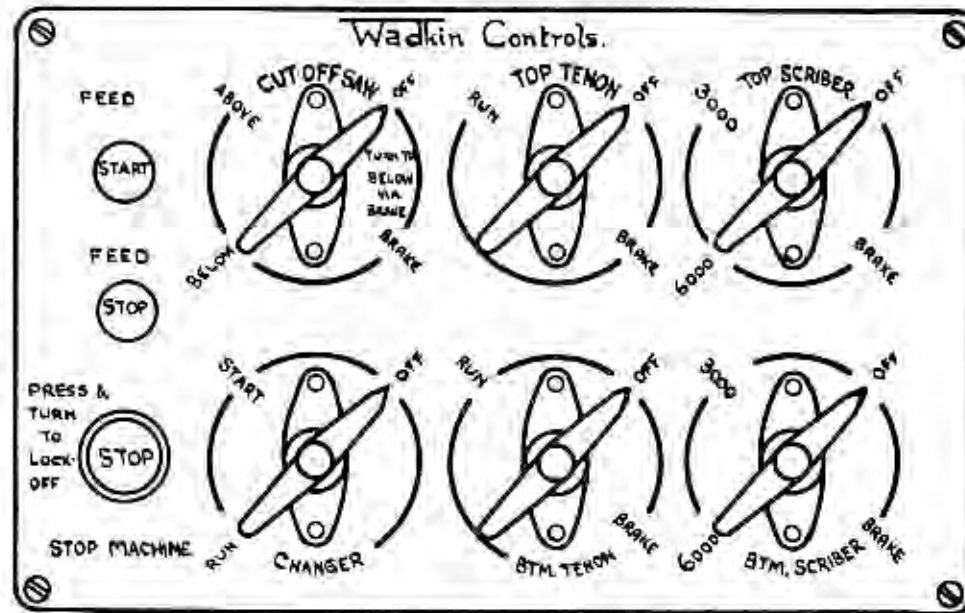
The top left hand switch is marked "CUT OFF SAW" and has two positions for running the saw above or below the timber. The rotation of the saw is clockwise when cutting above the timber line and anti-clockwise when cutting below, looking at the tail end of the saw motor. The saw is started when the switch is at "ABOVE" or "BELOW" position but as is shown on the plate the switch must be turned to below via the "BRAKE" position, that is the switch must be turned in a clockwise direction. To stop the saw spindle the switch is turned to the "BRAKE" position and should be returned to the "OFF" position immediately the spindle has stopped. The red warning light mounted on top of the fixed headstock

is illuminated when any of the brakes are working, and will automatically cut out when the brake is switched off. This warning system applies to all cutter heads and it should be noted that only one spindle should be braked at one time.

The two centre switches marked "TOP TENON" and "BOTTOM TENON" have only three positions. They are started when switch is set to "RUN" and as a stop is fitted after "RUN" the brake position is reached via "OFF."

The two right hand switches are marked "TOP SCRIBER" and "BOTTOM SCRIBER" and have four positions. The 3,000 r.p.m. speed is started when the switch is turned to this figure and speeded up to 6,000 r.p.m. when moved in an anti-clockwise direction to 6,000. As on the other heads they are braked with the switch at "BRAKE" and when the spindles have stopped the switch must be returned to the "OFF" position.

On the extreme left hand side of the control panel are situated three push buttons, the top one coloured green is marked "START FEED," the centre one is coloured red and marked "STOP FEED." These two are for controlling the feed chains. The bottom red push button is marked "STOP MACHINE" and when operated, stops all electrically driven units on the machine. This button is fitted with a lock, and should be pushed in and half turned to lock the button in the "OFF" position. This renders all controls inoperative and is used when leaving the machine or attending to cutterblocks.



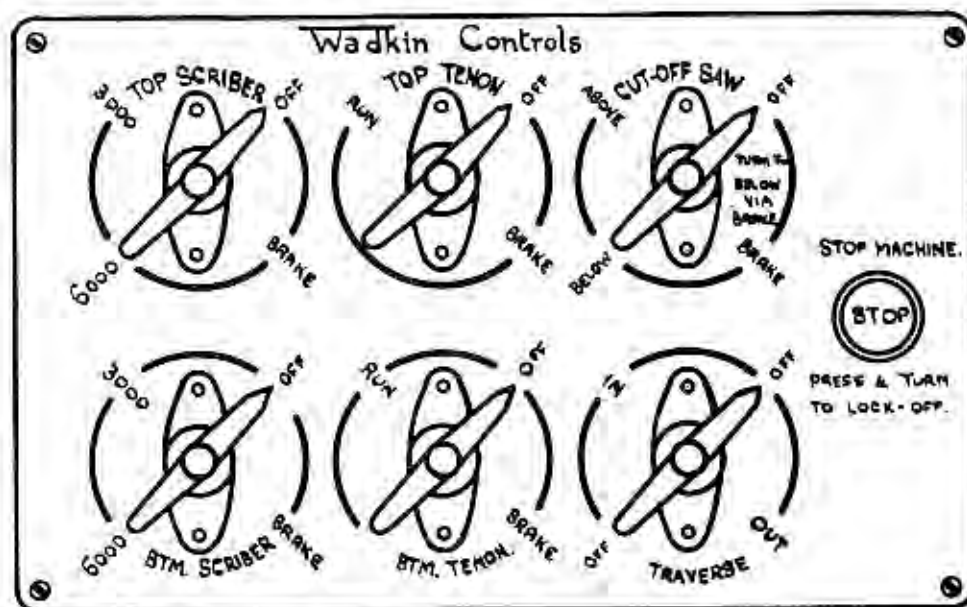
CONTROL STATION FIXED HEADSTOCK.

FIG. 20.

CONTROL OF ADJUSTABLE HEADSTOCKS

The control station for the adjustable beam, is fitted on the beam at the "feeding in" end and is engraved as shown in Fig. 21.

The method of operating the cutter head switches is exactly the same as the fixed headstock switches remembering to turn the switch on the "CUT OFF" saw to "BRAKE" via "OFF" as instructed on the plate. The bottom right hand switch is for traversing the adjustable beam in or out from the fixed headstock, the traverse motor being started when the switch is moved to either "IN" or "OUT."



CONTROL STATION ADJUSTABLE HEADSTOCK. FIG. 21.

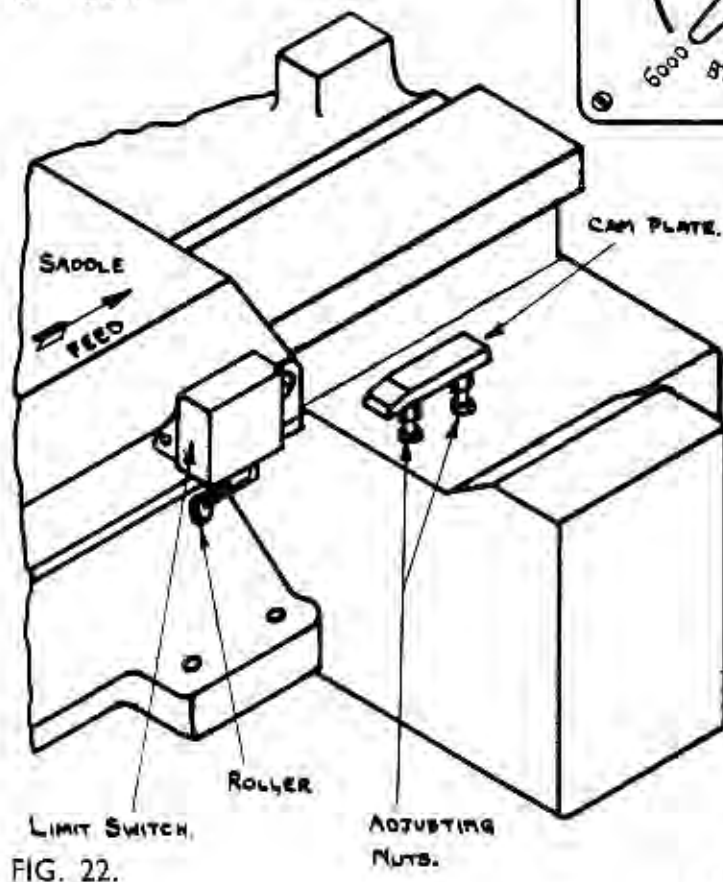


FIG. 22.

On the extreme right is another emergency red "STOP" button for stopping the whole machine, this button can also be locked by pushing in and giving a half turn.

OPERATING THE LIMIT SWITCH To prevent the traversing headstock over running the bed a limit switch is fitted on the saddle, the roller on the switch engages with a cam plate at the end of the bed, Fig. 22, and automatically stops the traverse motor. The cam plate as shown, is mounted on two studs, and may be adjusted vertically by removing the plate and unscrewing the studs and finally rellocking the nuts in the new position. This plate is set before despatch and only requires further adjustment if not working correctly. It should be noted that the limit switch, when operated, stops the whole machine and the headstock must be moved back by hand, off the limit switch cam, before the machine can be restarted.

BEARING LIST

MAKERS No.	SIZE BORE × O/D × WIDTH	NUMBER PER MACHINE	WHERE USED ON MACHINE
SKF 0.8 Thrust Washer	1" × 1 ³³ / ₈ " × ⁵ / ₈ "	8	Raising Screws to Top Pressure and all Cutter Heads.
SKF 0.16 Thrust Washer	2" × 2 ³¹ / ₁₆ " × ³ / ₄ "	1	Behind Worm Wheel on Feed Shaft.
SKF 0.19 Thrust Washer	2 ³ / ₈ " × 3 ¹³ / ₁₆ " × 1"	2	Nut for Saddle Traverse.
SKF 0.20 Thrust Washer	2 ¹ / ₂ " × 3 ³³ / ₁₆ " × 1"	1	Slipping Clutch end of Feed Shaft.
SKF RLS 10 Deep Groove Single Row Ball Bearing	1 ¹ / ₂ " × 2 ³ / ₄ " × ¹¹ / ₁₆ "	2	Feed Chain Idler Wheel.
SKF CRL 10 Single Row Cylindrical Roller Bearing	1 ¹ / ₂ " × 2 ³ / ₄ " × ¹¹ / ₁₆ "	2	Feed Chain Idler Wheel.
SKF RL 10 Double Row Self-aligning Ball Bearing	1 ¹ / ₂ " × 2 ³ / ₄ " × ¹¹ / ₁₆ "	4	Tail end of Scribing Spindles.
SKF RM 10 Double Row Self-aligning Ball Bearing	1 ¹ / ₂ " × 3 ¹ / ₈ " × ⁷ / ₈ "	6	Tail Cut-off Saw and Tenoning Spindles.
SKF RM 12 Double Row Self-aligning Ball Bearing	1 ¹ / ₂ " × 3 ³ / ₄ " × ¹⁵ / ₁₆ "	4	Cutter Block end of Scribing Spindles.
SKF 2309 Double Row Self-aligning Ball Bearing	45 m/m × 100 m/m × 36 m/m	6	Cutter Block end of Saw and Tenoning Spindles.
SKFRMS 12 Deep Groove Single Row Ball Bearing	1 ¹ / ₂ " × 3 ³ / ₄ " × ¹¹ / ₁₆ "	2	Worm Shaft.
SKF RL 14 Double Row Self-aligning Ball Bearing	1 ³ / ₄ " × 3 ³ / ₄ " × ¹¹ / ₁₆ "	1	Feed Shaft.
SKF RM 18 Double Row Self-aligning Ball Bearing	2 ¹ / ₄ " × 5" × 1 ¹ / ₄ "	1	Slipping Clutch end of Feed Shaft.
Ransome and Marles LDJ 35 Double Row Ball Journal	35 m/m × 72 m/m × 23 m/m	4	Top Pressure Chain Wheels.

ADJUSTMENTS AND GENERAL MECHANICAL MAINTENANCE

ADJUSTING TOP PRESSURE TRACK

The method of adjusting the top caterpillar track for length is shown in Fig. 23. The bracket holding the chain wheel moves between two slideways on the beam, the clamping nuts "A" should be slackened first and then the locknut on the adjusting screw "B" should be moved back. By turning the screw "C" the bracket can be moved either in or out. When the required amount has been reached the nut "B" should be locked up against the square face and the clamping nuts re-locked. The rubber pressure pads are held in position with two screws and special washers and are easily detachable. Care must be taken always to replace the special washers.

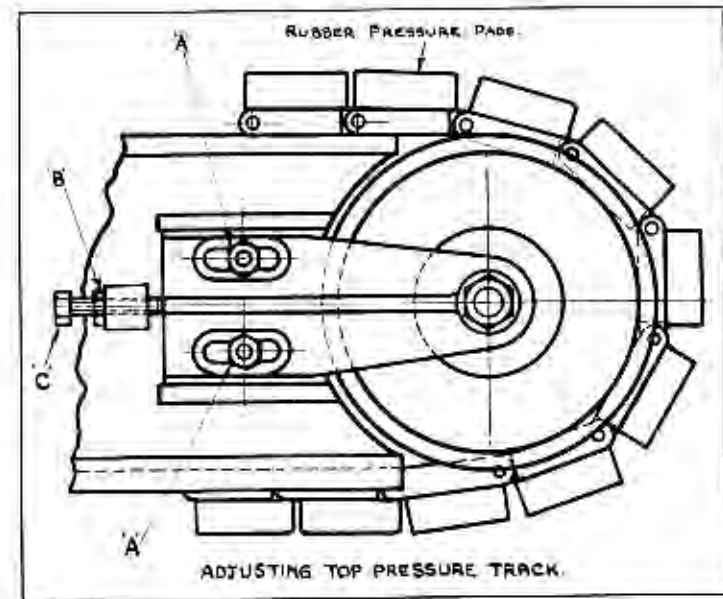


FIG. 23.

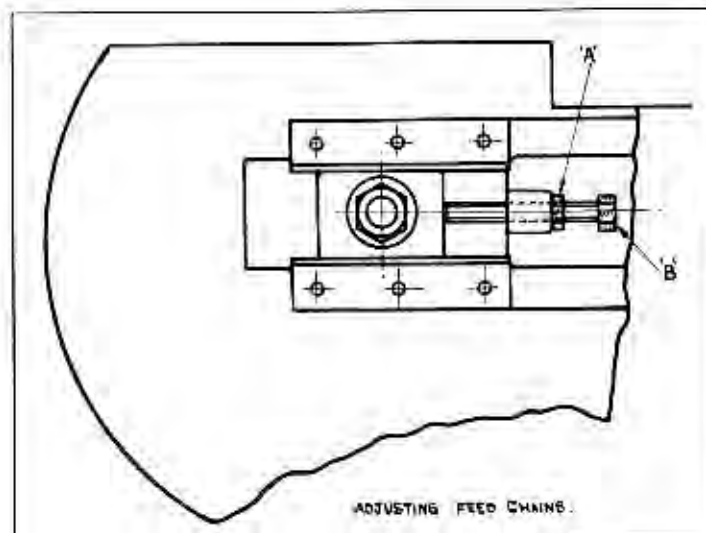


FIG. 24.

ADJUSTING FEED CHAINS

Adjustment for both feed chains is provided at the "feeding in" end of the beams as shown in fig. 24. The idler chain sprockets are supported in bearing blocks and these blocks move between the slideways and are held in position by lip plates. To adjust the chain for length, the locknut "A" should be slackened off and the screw "B" turned until the correct tension has been obtained. Both chains should be adjusted an equal amount and aligned as described on Page 14. After adjustment has been made the sheet iron covers should be removed to ensure that the feed dogs are clearing all points.

ADJUSTING FEED CHAIN SLIPPING CLUTCH

The drive to the chain is transmitted via the rear feed shaft, the power from the feed motor being taken by three No. 51A vee ropes to the worm shaft and through the worm and wheel to the feed clutch. This clutch is held in position with a powerful spring. Should any overloading occur while feeding the timber the clutch is arranged to slip and disengage the drive. The position of the cover enclosing the slipping clutch mechanism is shown in the general view of the machine, Fig. 2. The following procedure for adjusting the clutch should be adopted.

The cover "A," Fig. 25, should be removed and this will expose the nut and spring. The nut is held in position with a pegged grub screw and this must be removed before the nut can be turned. A tommy bar should be inserted in the nut and then by rotating the nut the spring can be tensioned or released according to requirements. The nut must be rotated *at least one complete revolution* until the small keyway can be seen at the bottom of the tommy hole. The grub screw can then be replaced, care being taken to ensure the peg end is fitting in the keyway correctly, and lock up to prevent the nut rotating during motion.

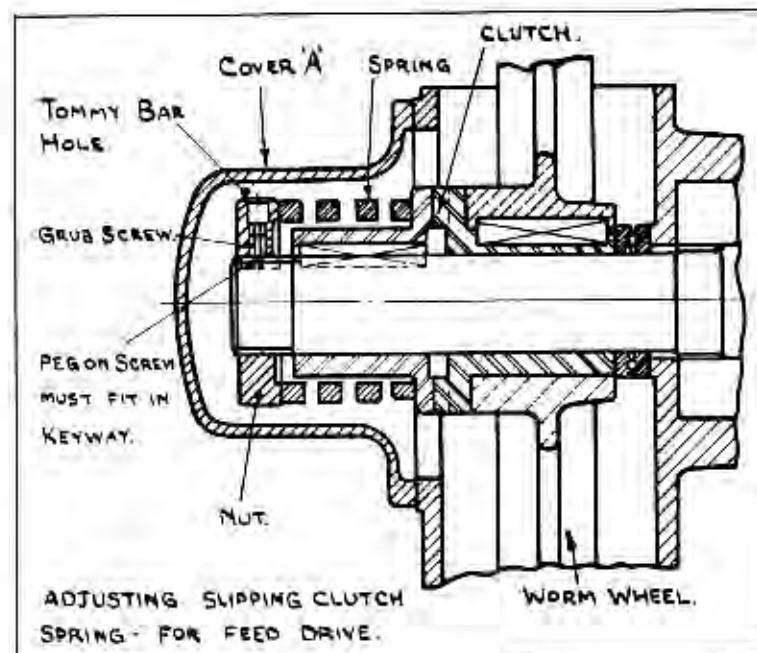


FIG. 25.

METHOD OF REMOVING TRAVERSE SCREW

Should it be found necessary to remove the main traverse screw from the bed it can only be taken out from the adjustable headstock end of the bed. If a frequency changer has been supplied, the sheet steel cover over the changer unit should be removed to allow the screw to slide out between the changer and the motor. Remove the bearing bracket from the adjustable headstock end of the bed and after withdrawing the taper pin in the collar, slide the bracket off the screw. Fasten a lathe carrier to the plain portion of the screw and turn to unscrew the traverse screw out of the moving headstock saddle nut.

LUBRICATION

CUT OFF SAW MOTORS The saw motor is lubricated by grease only, it is recommended that only WADKIN special ball bearing grease is used and the bearings should be given three depressions of the grease gun every three months, at the points indicated, Fig. 26. It is essential that the specified amount of grease is delivered to the bearings at regular intervals to ensure the true running of the spindle. Use WADKIN grease, grade L.7.

TENONING HEAD MOTORS The top and bottom tenoning heads are grease lubricated and three depressions of the grease gun every three months are required.

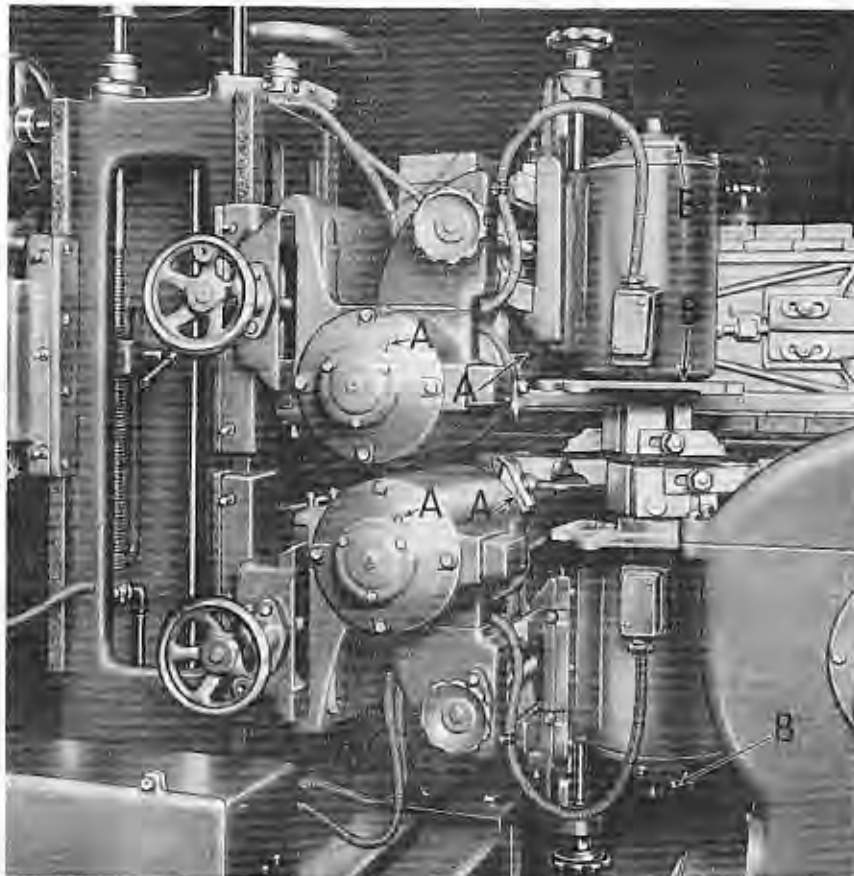


FIG. 27.

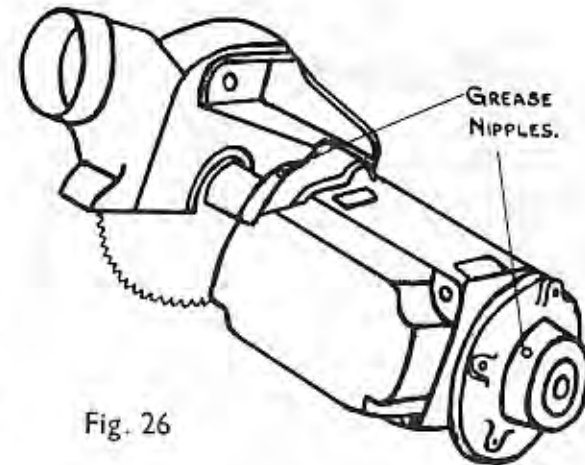


Fig. 26

Full instructions for using the gun will be found on the WADKIN grease containers. The lubricating points are shown at "A" on Fig. 27. Use WADKIN grease, grade L.7.

SCRIBING HEAD MOTORS The top and bottom scribing head motors are lubricated with WADKIN grease, grade L7, at points "B," Fig. 27, and as on the other motors three depressions of the grease gun applied every three months are sufficient.

All hand operated movements should be oiled every week to ensure free movement with the minimum of effort. A slight film of oil applied with an oil can on the slide faces of all the heads will result in smooth operation, also oil should be applied to the main rise and fall screws and to the minor adjusting screws. Grease nipples are fitted to the top bearing brackets for lubricating the main rise and fall screws. Six depressions of the grease gun every month being sufficient. The cross adjustment screws require three to four drops of WADKIN Oil, Grade L.4, at the oil holes positioned on the bearing brackets.

LUBRICATION (Continued)

FEED CHAIN LUBRICATION

Each feed chain is automatically lubricated by a mechanical oil pump, driven from the main feed shaft. Pipes are taken from the pump to various points along the beam as shown in Fig. 28, also to the brass chainway. A felt wiper is fitted in each beam as shown at "A" with an oil pipe from the pump feeding the felt pad. The wiper is kept in contact with the chain by a spring loaded plunger and the initial positioning of the bracket is obtained by releasing the nuts "C" and sliding the bracket up or down in the slots provided. Should it be found necessary to replace the felt pad, it should be soaked in oil before fitting.

Although a mechanical pump supplies the various points with oil automatically, it should be remembered that this pump can only function when the pump tank has sufficient supply. The oil level shown on the glass should be checked daily, and the tank refilled with WADKIN Grade 4 Oil. The supply must be adjusted to the four main oil pipes by adjusting the brass knurled knobs on the top of the pump. These knobs are engraved showing the direction of rotation for increasing the oil supply. As a general guide the supply to the felt pad and the brass chain rail can be cut down to just below half pressure. The remaining pipe to the feed shaft bearing should be delivering full pressure.

LUBRICATION OF TOP PRESSURE

The chainwheels on the top pressure are mounted on ball bearings and grease lubricated. The nipples are on the inside of the beam "E" as shown in Fig. 28. Three depressions of the grease gun are required every month, using WADKIN grease, grade L.7. The underside of the track slideway is oil lubricated, a pipe being taken from a drip feed oiler to the slide. The drip feed oiler should be filled with WADKIN grade 4 oil daily and the flow should be checked at the sight glass underneath the oiler. A little powdered graphite spread along the top and bottom slideways will greatly increase the efficiency of this pressure. The gear box for the rise and fall movement to the pressure beam should be filled with WADKIN grade 4 oil to the level of the 90° tip up oiler shown at "D" at Fig. 28, and should be checked every three months. Two tip up oilers are provided at "F" for lubricating the handwheel shaft bearings each month with WADKIN grade 4 oil.

LUBRICATION CHART FOR FEED CHAINS

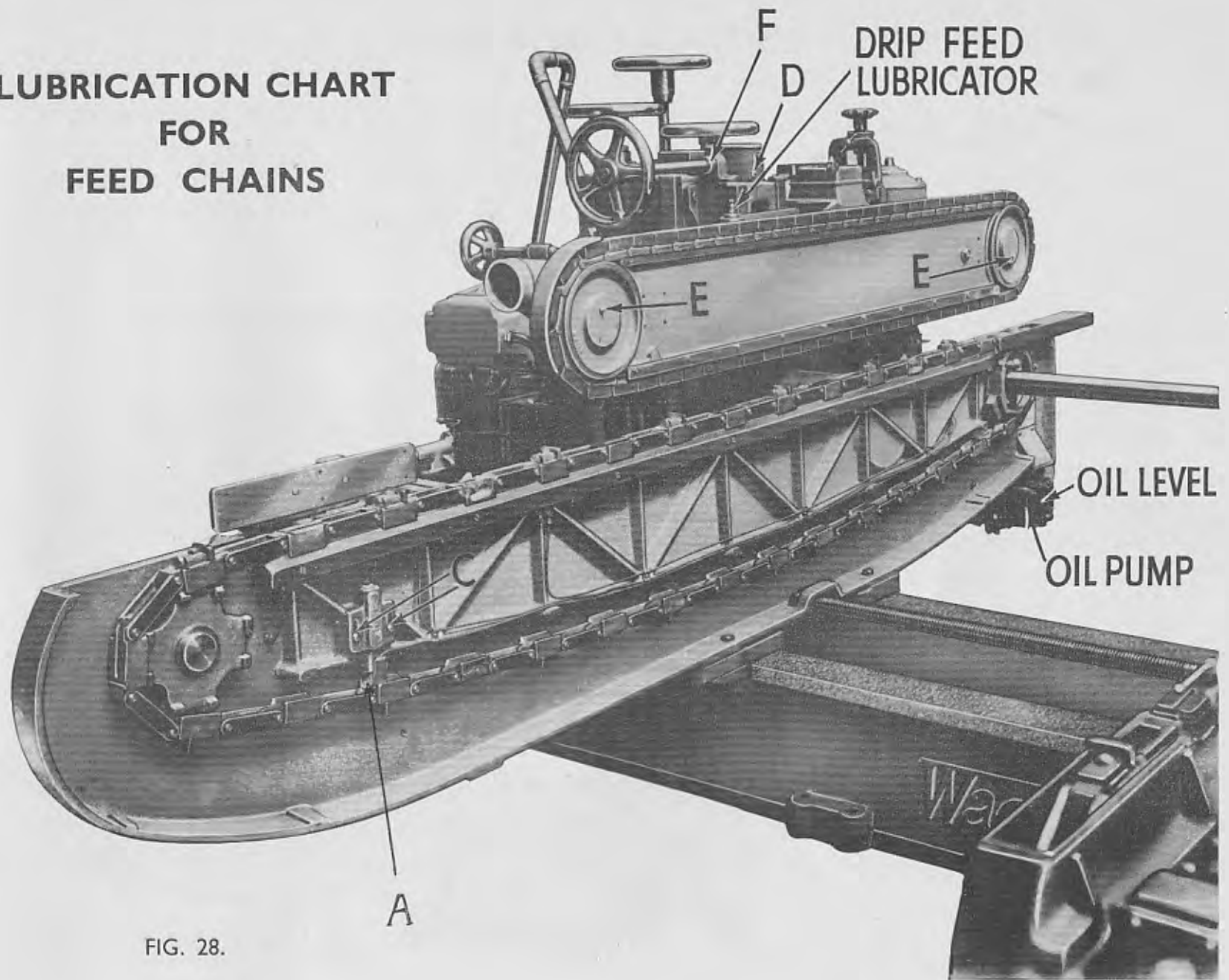


FIG. 28.

TRAVERSE MOTION LUBRICATION

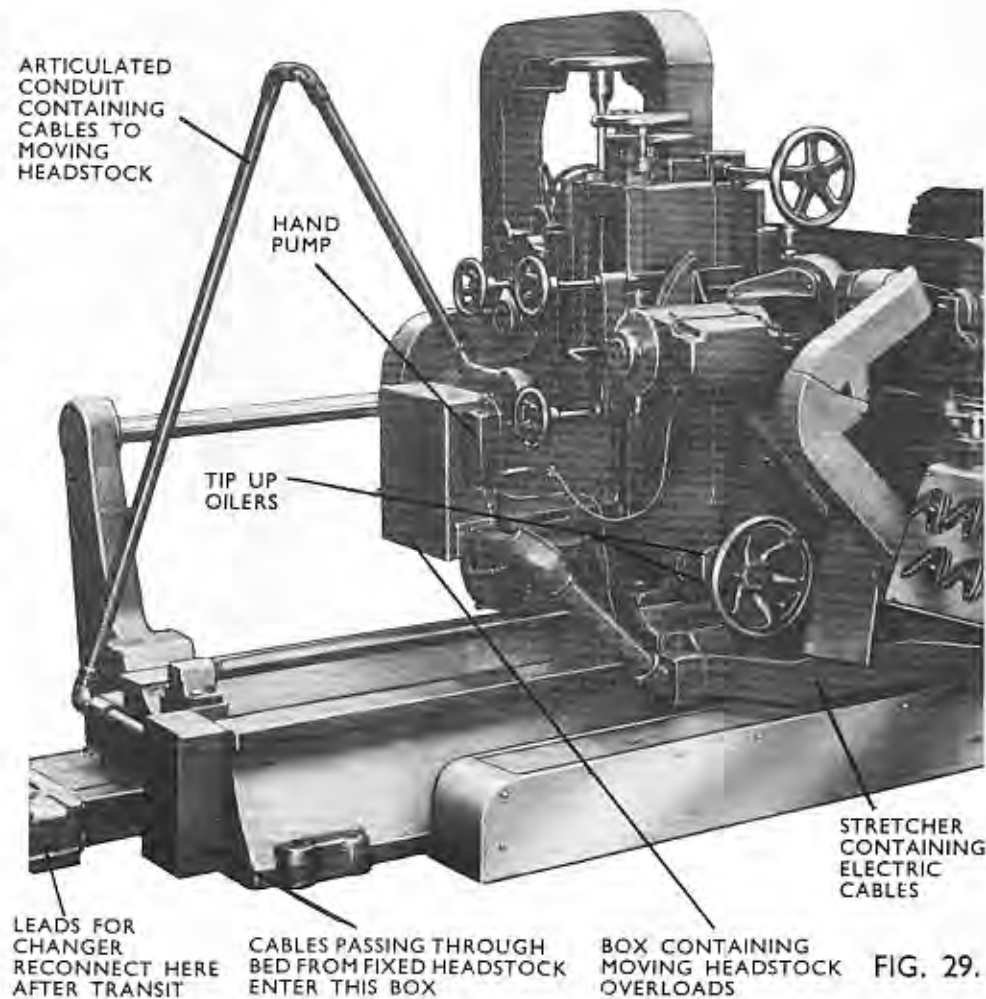
The traverse motion is lubricated by the hand operated oil pump, mounted on the contactor box, Fig. 29. Pipes are taken from this pump to the various points of the traverse motion. The pump should be kept filled with WADKIN grade 4 oil and the oil level in the tank checked daily. One pipe is taken to the traverse nut and one pipe is taken to each side of the slide, and as previously noted this pump should be operated four or five times before the headstock is traversed. Lubrication to the hand traverse motion is provided by the tip up oilers, one at right angles to the shaft on the brackets behind the handwheel, and three to four drops of WADKIN grade 4 oil each week will be sufficient for this point.

WORM BOX LUBRICATION

The oil filter fitted on the worm box is combined with the sight glass and an oil drain plug is situated alongside. The worm box should be lubricated with WADKIN heavy gear oil, type L.2. Check the oil level each month and top up the supply if necessary.

FEED SHAFT BEARING BRACKET

The feed shaft extension bracket houses a ball bearing for supporting the end of the shaft. This bearing is lubricated with a grease nipple on the cover. Three to four depressions of the grease gun every week are required at this point, using WADKIN grease, grade L.7.



LUBRICATION (Continued)

LUBRICATION OF ROLLER BOX

On the 60" machine the adjustable chain beam is supported by a roller box mounted on a stub bracket attached to the beam. This roller moves along a steel channel let in the floor. The roller box bearing is lubricated by a nipple on the cover and requires three or four depressions of the grease gun each week using WADKIN grease, grade L.7

GENERAL CLEANLINESS OF THE MACHINE

A WADKIN portable blower should be used to clean the machine from accumulation of chips and sawdust, every day. Particular attention should be given to keeping the feed chains as clean as possible. The sheet iron covers on the inside of the chain beam should be removed each week and the sawdust blown out. Care should be taken to ensure that all sawdust and chips are removed from underneath the feed chains as this may cause them to run out of line.

The caterpillar top pressure needs attention daily, blowing out the chips and sawdust that will be found clogging the end guards.

Any excess oil on the machine will tend to collect dust and all oil pipes should be checked for excessive pressures if this trouble is found.

On the 60" machine the roller box for the outer support should be examined monthly : the covers on the bearing box should be removed and all dust blown out.

LUBRICATION EQUIVALENTS

If it is desired to use lubricants other than WADKIN types, the following equivalents are listed:—

WADKIN OIL GRADE L.4—or SHELL JY5 or VACUUM "VACTRA" OIL (Heavy Medium) or WAKEFIELD "PERFECTO" (Heavy).

WADKIN OIL GRADE L.2—or SHELL CY3 or VACUUM D.T.E. (Extra Heavy) or WAKEFIELD "ALPHA" OIL.

WADKIN GREASE L.7—or SHELL RB.

CAPACITY CHART 24" and 60" MACHINE

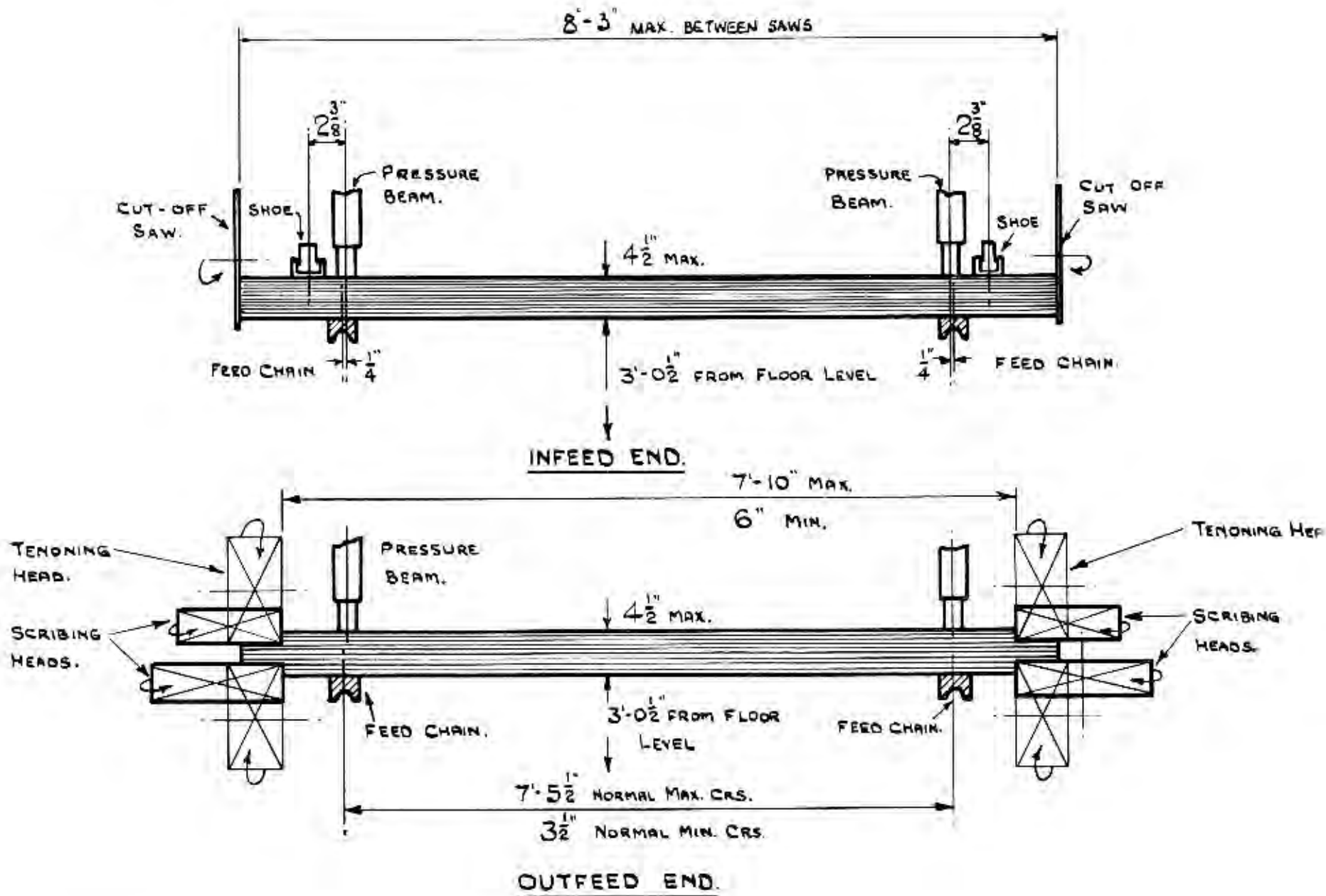


FIG. 30.

CAPACITY CHART 24" and 60" MACHINE

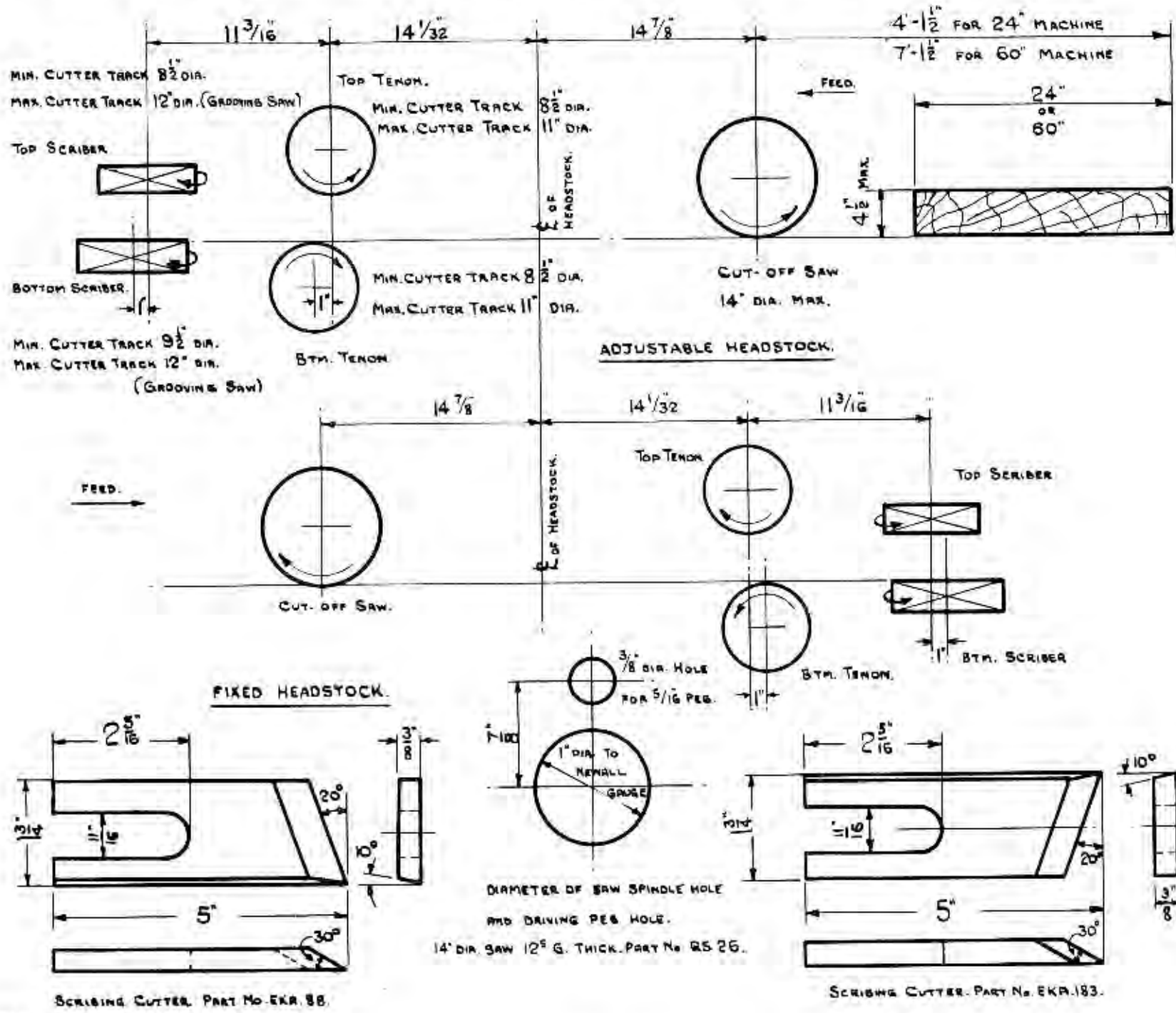


FIG. 31.

RANGE OF FEED DOGS FOR DOUBLE END TENONER

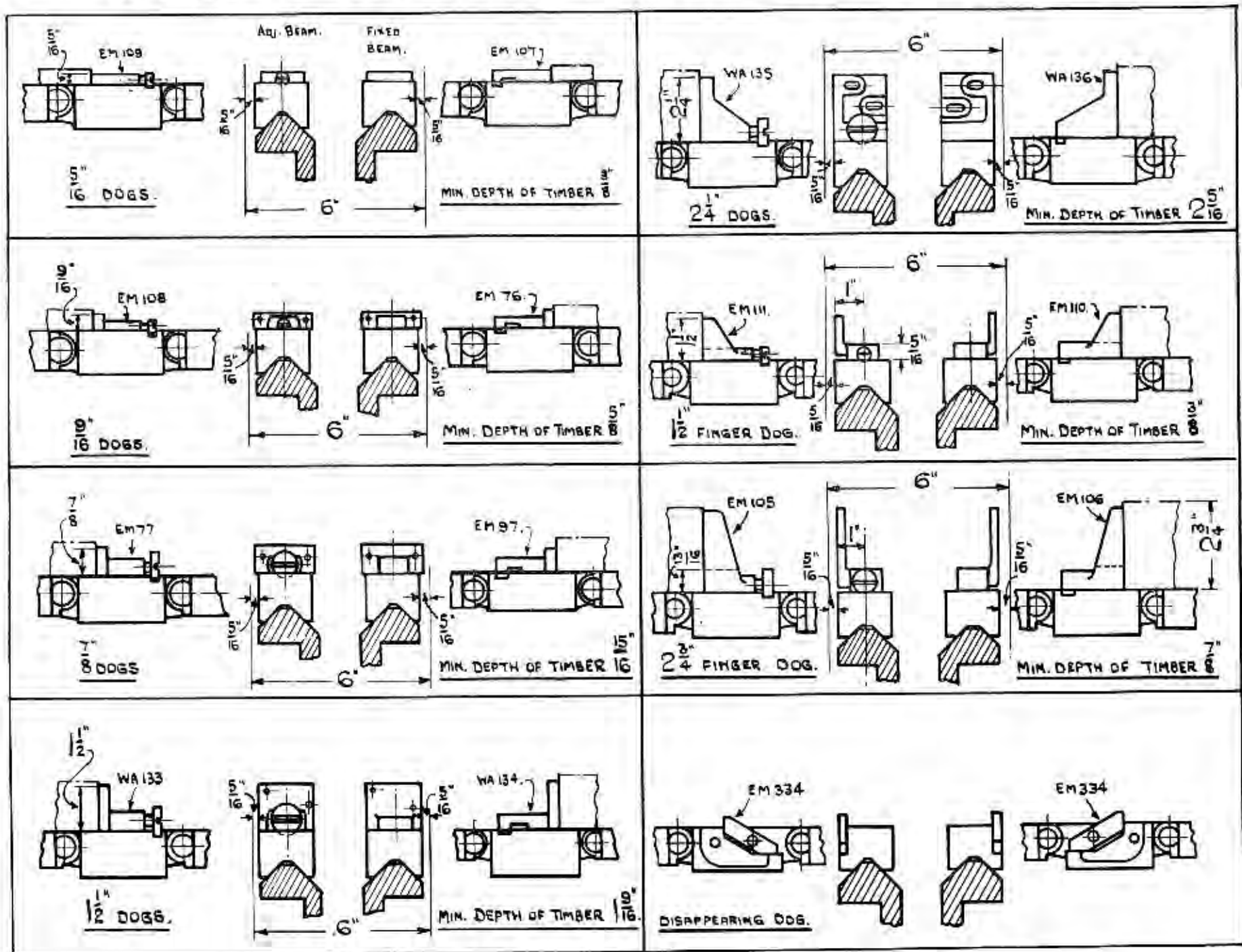


FIG. 32.

ELECTRICAL INSTRUCTIONS

INSTALLATION

The whole of the cabling between the motors and control gear is carried out by WADKIN LTD., but it is necessary to make certain disconnections in order that the machine can be dismantled for despatch. To put the machine into service it is necessary to remake the connections which have been broken for transit, and to bring the line cables to the machine for it to be ready for running. This should be done as follows :—

1. Re-connect the outgoing leads at the main switch.
2. Re-connect the three wires at the feed motor overloads. Access is obtained by removing the cast cover shown in Fig. 2. The overload panel can be hinged open to give access to the terminals at the rear.
3. Replace the harness in the stretchers, see Figs. 2 and 29, and re-connect at control stations to colours and markings.
4. If frequency changer is included, cables should be re-connected at terminal block situated as indicated at Fig. 29.
5. Connect the machine solidly to earth.
6. Connect the incoming lines at main switch. 30 amp. cables are required for a 400 volt 3-phase 50-cycle machine. Check any one cutterhead for correct direction of rotation, and if necessary interchange any two line leads to correct rotation. All movements will then be correct.
7. The machine is now ready to start up, providing that the rust preventing grease has been removed and oil levels and lubrication has been checked.

Operation should proceed as operation instructions on Page 17.

ELECTRICAL INSTRUCTIONS (Continued)

FAILURE TO START

1. Electric supply is not available at machine.
2. Fuses have blown or are not fitted. See Fig. 2 for position of main fuses supplied with machine.
3. Isolating switch, Fig. 18, has not been closed.
4. One of the master stop buttons is locked off.
5. All switches are not in the " OFF " position. After the machine has been stopped by pressing the master stop button, it cannot be restarted until all the switches, except the main switch, have been moved to the " OFF " position.
6. Moving headstock limit switch is on cam. See Fig. 22 on Page 19.
7. Imperfect connection causing faulty contact. Check re-connections and if necessary at other points.

SHUT DOWN DURING OPERATION AND FAILURE TO RESTART

1. Fuses have blown. See Fig 2 for position.
2. Overloads have tripped. They will reset automatically after a short time. The machine can then be restarted in the usual manner after all the switches have been moved to the " OFF " position.

NOTE.—Total shutdown due to overloads tripping can only be caused by leaving brake on or traverse motor overload. See note 1 under " Feed Failures."

FEED FAILURES

1. Overloads have tripped. These will reset automatically after a short time and feed can be restarted in the usual manner.

It should be noted that overload on the headstocks or the frequency changer would trip the feed only, in order to remove the overload. The reason for this is that if both the headstocks and the feed are tripped simultaneously, the headstocks will stop quicker than the feed with consequent jamming of the stock into stationary cutters.

2. Erratic operation of the feed. This is due to the pointer not being in line so that feed selection is not registering properly. See Fig. 19, or contacts in the switch are sticking up.

ELECTRICAL INSTRUCTIONS (Continued)

SCRIBER HEADSTOCKS FAIL TO GAIN FULL SPEED (High Frequency Machine only).

The excitation winding on the frequency changer should have any two leads changed over.

ELECTRICAL MAINTENANCE

The machine does not require regular electrical maintenance apart from blowing down motors and checking earth connection. Control gear, etc., should not be opened up unless a fault occurs which will probably be a very rare occurrence.

Do not file switchgear or rotary switch contacts, and do not change them because they look burnt unless they are definitely faulting.

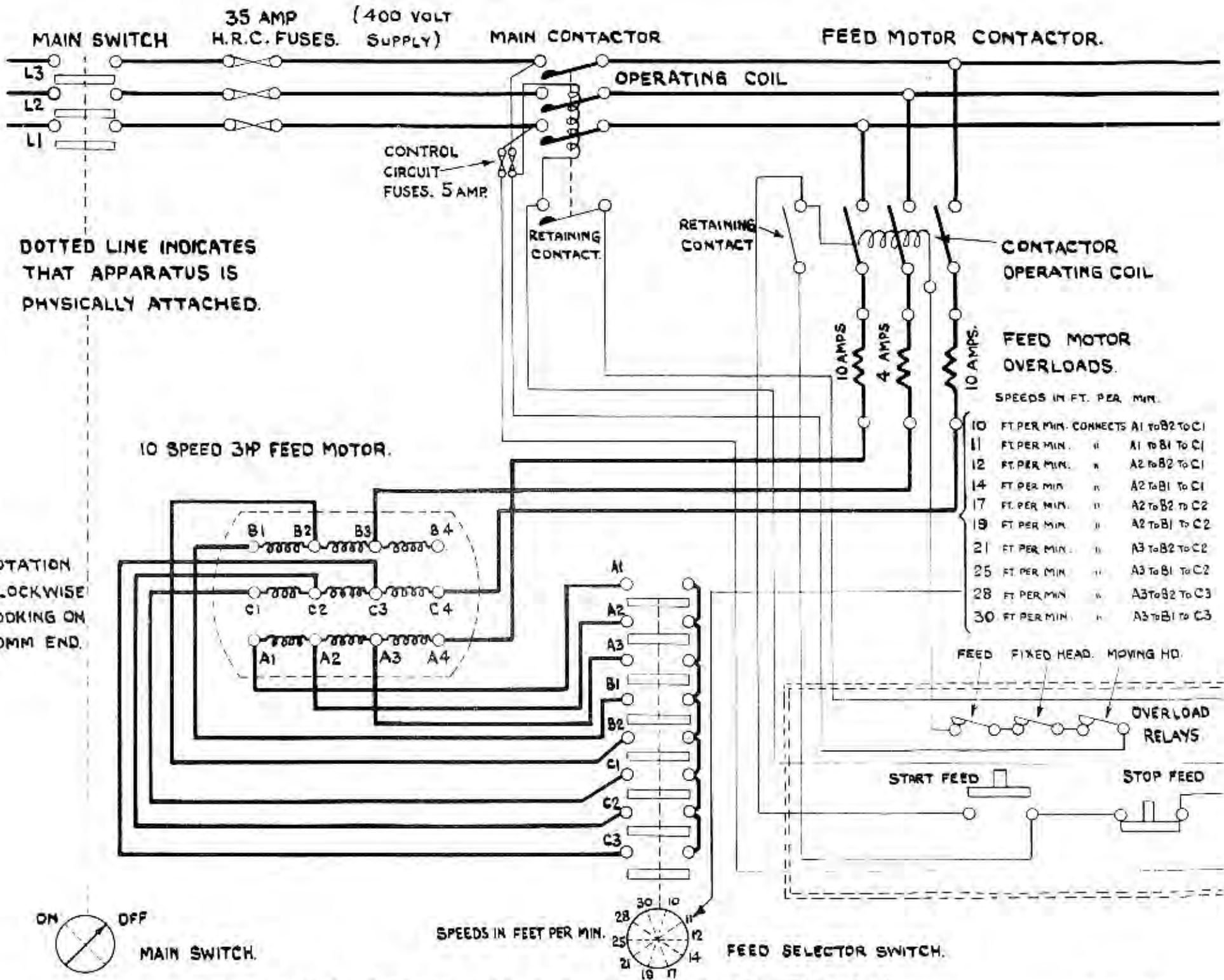
In the case of high frequency machines, inspect the brushes on the slip rings of the changer occasionally.

ADJUSTMENTS TO OVERLOADS

Adjustment discs are provided on the overloads, but normally these are set at the Works and do not require further attention.

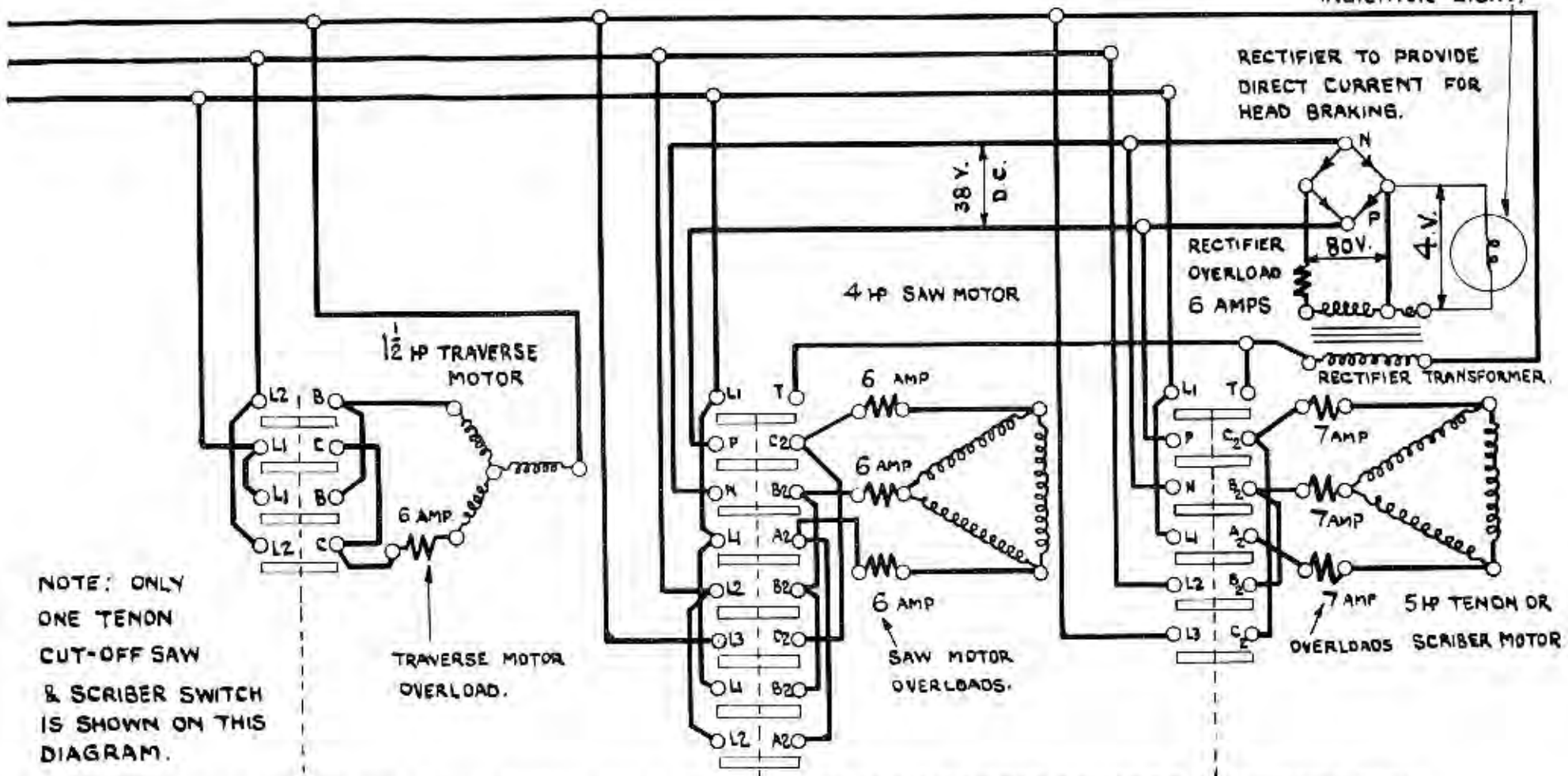
GENERAL

Users are recommended to display in appropriate position in maintenance department Wadkin Electrical Maintenance Instruction Card, No. 356, which is issued gratis on application. This deals with general installation maintenance.

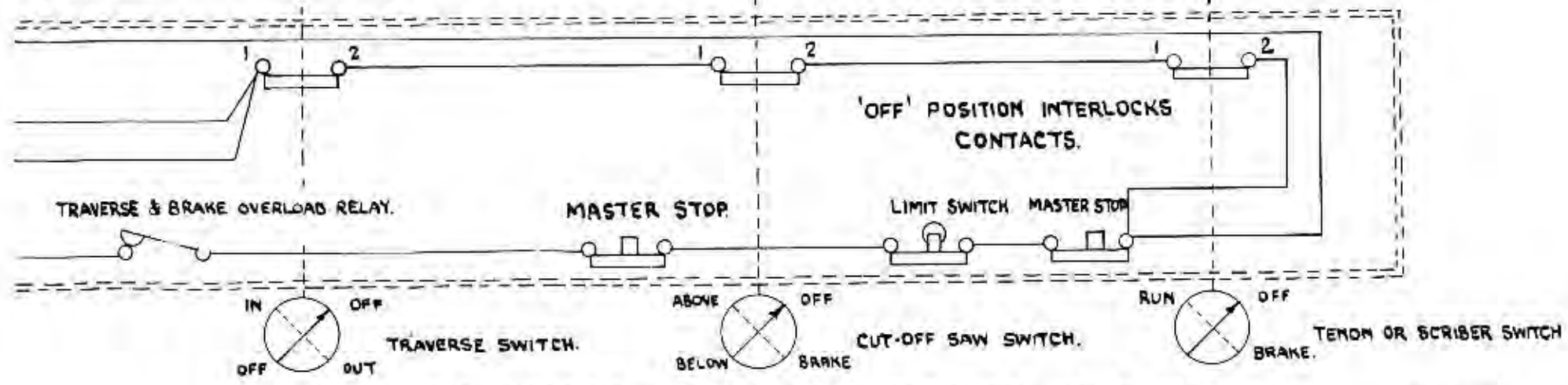


SCHEMATIC DIAGRAM. DOUBLE END TENONER TYPE WA.

RECTIFIER TO PROVIDE DIRECT CURRENT FOR HEAD BRAKING.

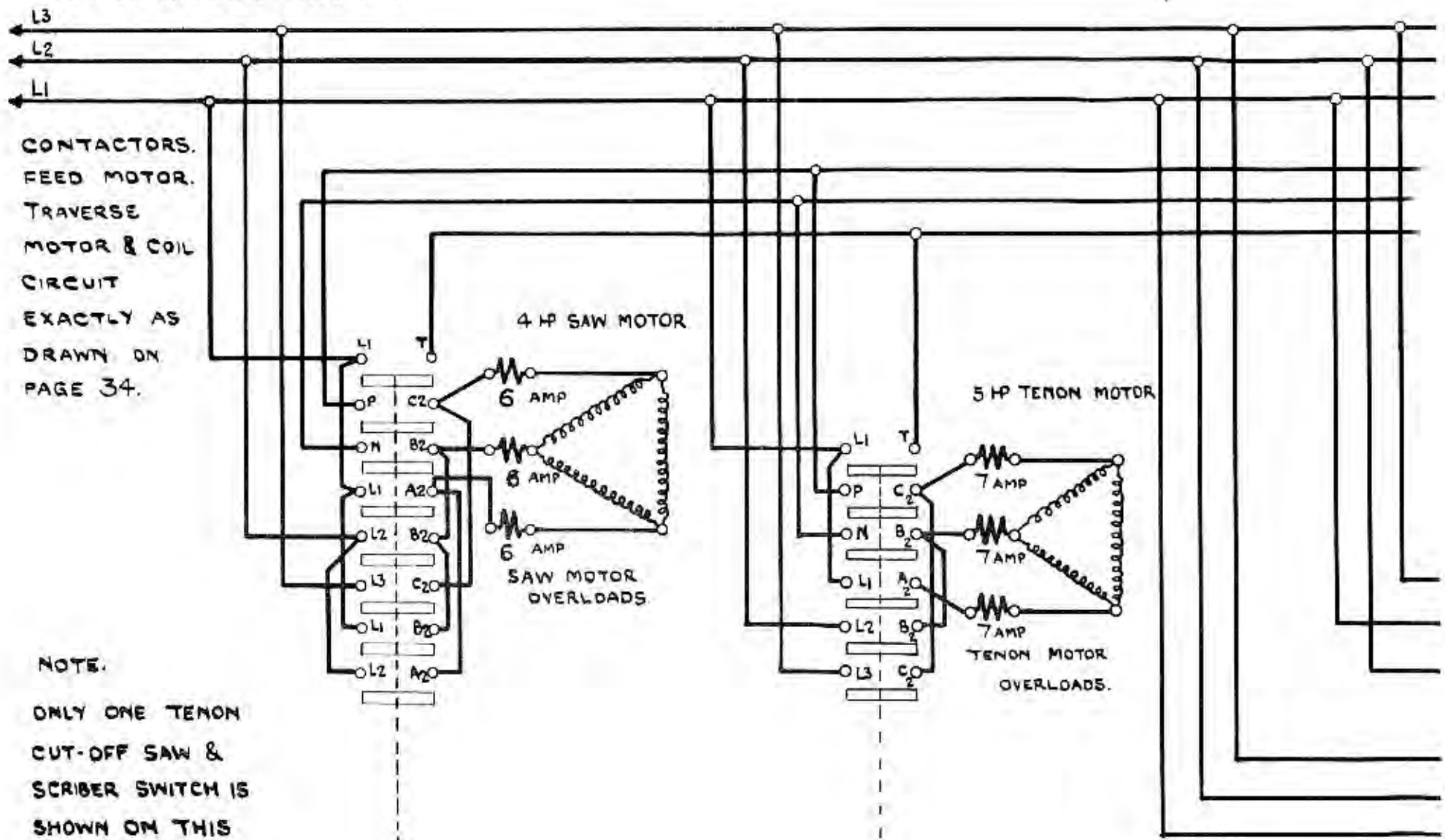


NOTE: ONLY ONE TENDON CUT-OFF SAW & SCRIBER SWITCH IS SHOWN ON THIS DIAGRAM.



SCHEMATIC DIAGRAM. DOUBLE END TENONER TYPE WA.

TO MAIN SWITCH & FUSES ETC.



CONTACTORS.
FEED MOTOR.
TRAVERSE
MOTOR & COIL
CIRCUIT
EXACTLY AS
DRAWN ON
PAGE 34.

4 HP SAW MOTOR

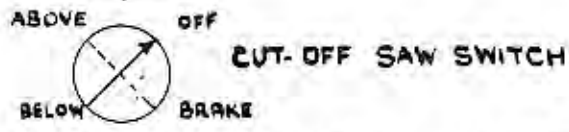
5 HP TENON MOTOR

6 AMP
8 AMP
6 AMP
SAW MOTOR
OVERLOADS.

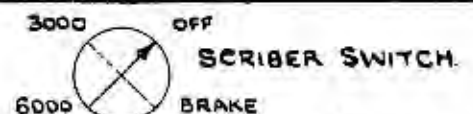
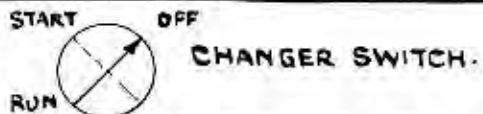
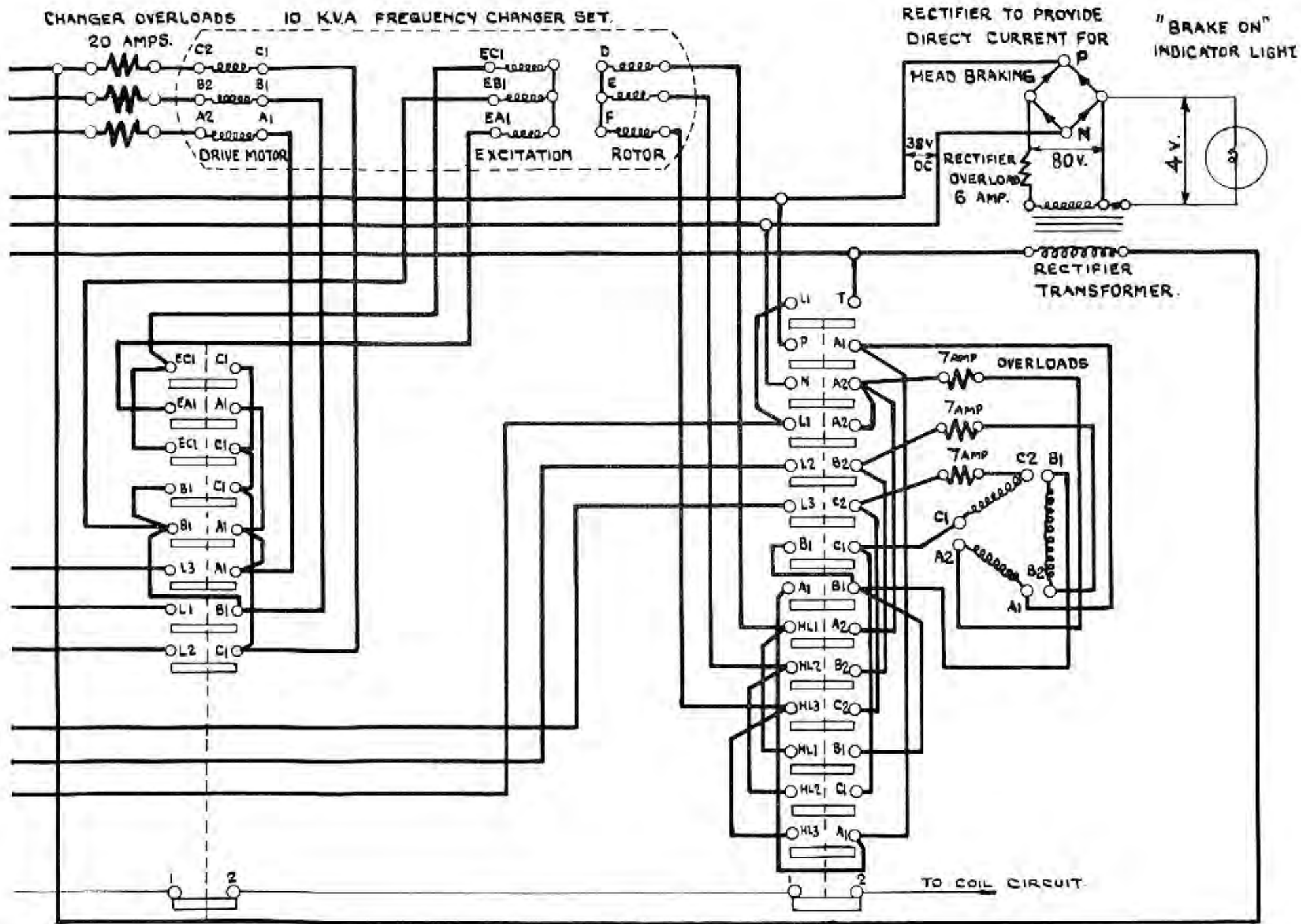
7 AMP
7 AMP
7 AMP
TENON MOTOR
OVERLOADS.

NOTE.
ONLY ONE TENON
CUT-OFF SAW &
SCRIBER SWITCH IS
SHOWN ON THIS
DIAGRAM.

TO COIL CIRCUIT.

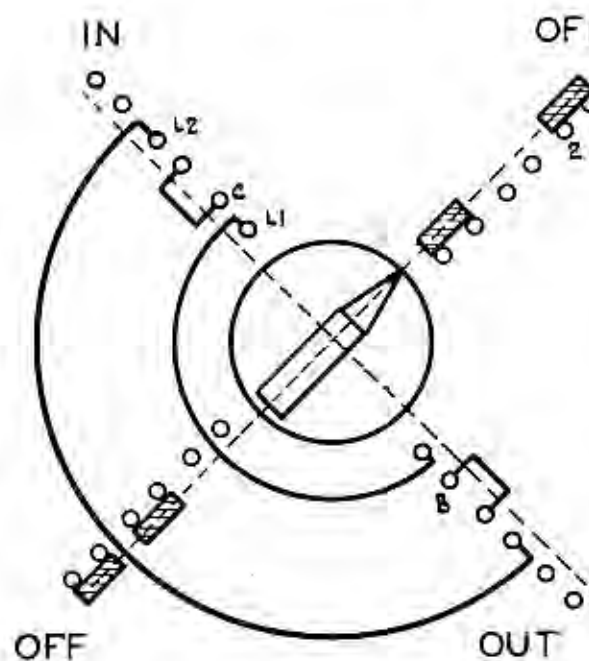


SCHEMATIC DIAGRAM - DOUBLE END TENONER TYPE WA. (TWO SPEED)
PAGE 36



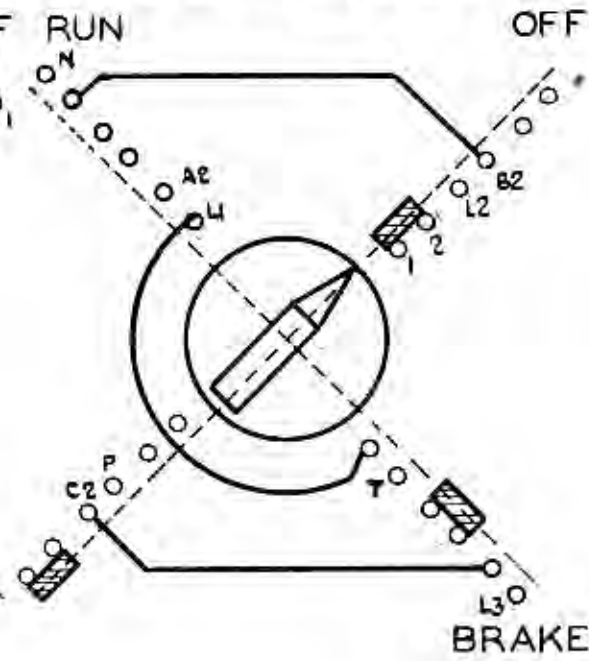
SCHMATIC DIAGRAM. DOUBLE END TENONER TYPE WA. (TWO SPEED)

TRAVERSE CONTROL



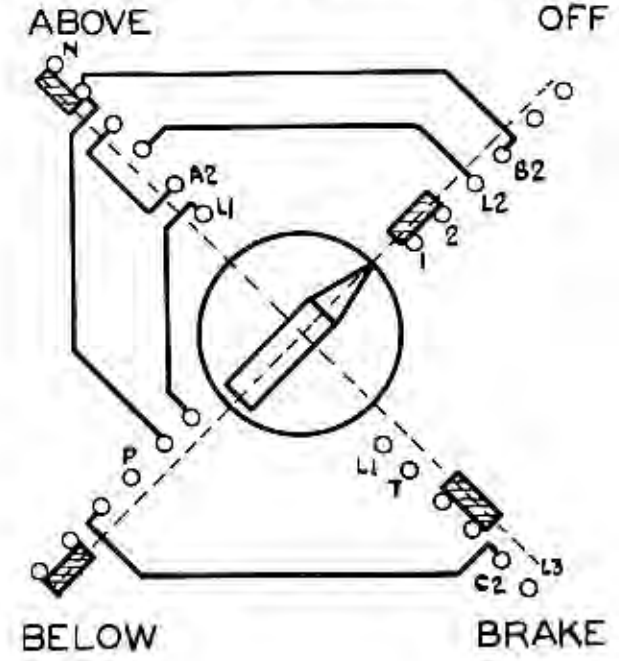
"OFF" CONNECTS 1 TO 2
 "IN" CONNECTS L1 TO C
 L2 TO B
 "OUT" CONNECTS L1 TO B
 L2 TO C

TENON HEAD CONTROL.

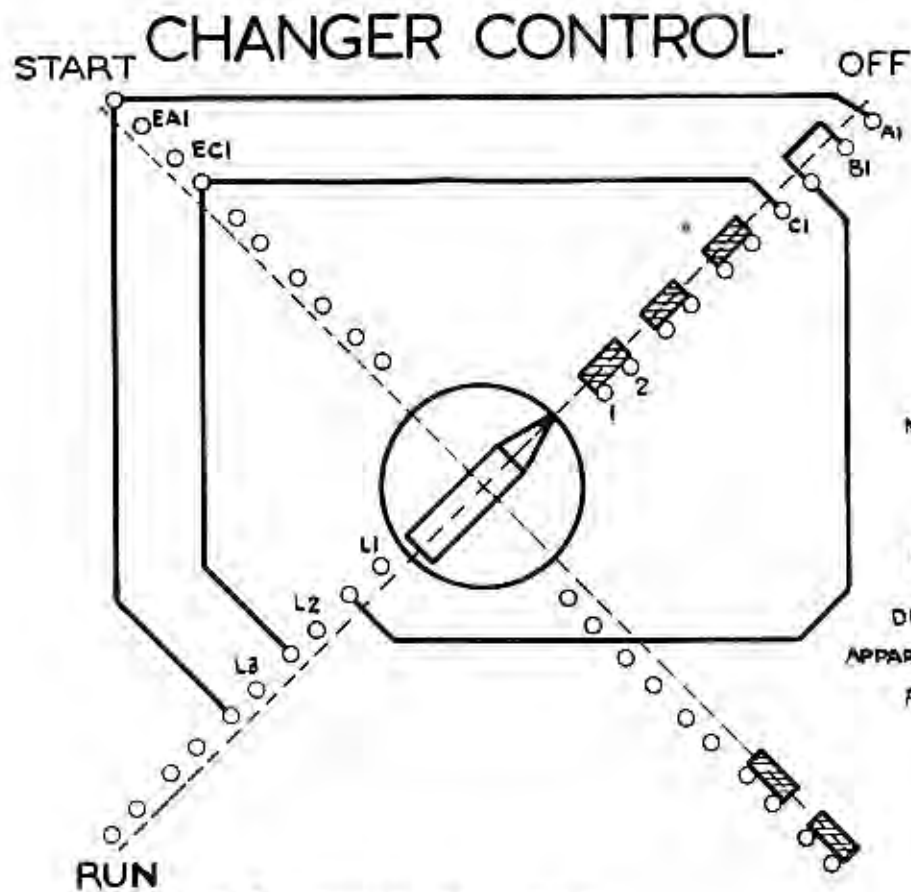


"OFF" CONNECTS 1 TO 2
 "RUN" CONNECTS L1 TO A2.
 L3 TO C2.
 L2 TO B2.
 "BRAKE" CONNECTS L1 TO T
 C2 TO P
 B2 TO N

CUT-OFF SAW CONTROL.



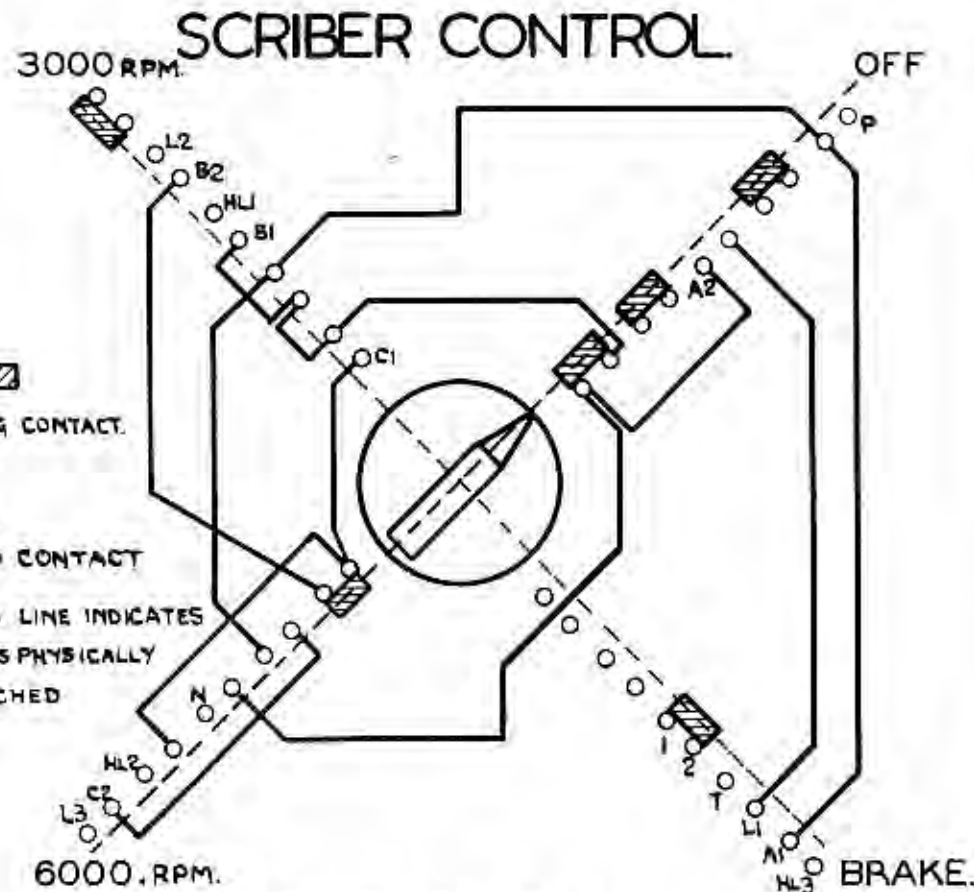
"OFF" CONNECTS 1 TO 2
 "ABOVE" CONNECTS L1 TO A2.
 L3 TO C2.
 L2 TO B2.
 "BELOW" CONNECTS L1 TO B2.
 L3 TO C2.
 L2 TO A2.
 "BRAKE" CONNECTS L1 TO T
 C2 TO P
 N TO B2.



"OFF" CONNECTS 1 TO 2

"START" CONNECTS BI TO CI.
A1 TO BI.

"RUN" CONNECTS L1 TO BI
L2 TO CI
L3 TO A1
EA1 TO A1
ECI TO CI



"OFF" CONNECTS 1 TO 2

3000 RPM. CONNECTS L2 TO B2.

L1 TO A2.

L3 TO C2

A1 TO BI.

BI TO CI.

6000 RPM. CONNECTS

HL1 TO BI

HL2 TO CI

HL3 TO A1

A1 TO C2

BI TO A2

CI TO B2

"BRAKE" CONNECTS

L1 TO T

P TO A1

N TO A2

DEVELOPED CONTROL DIAGRAM. DOUBLE END TENNER TYPE WA. (2 SPEED MACHINE)

(USED IN CONJUNCTION WITH SCHEMATIC DIAGRAM ON PAGES 36 & 37)

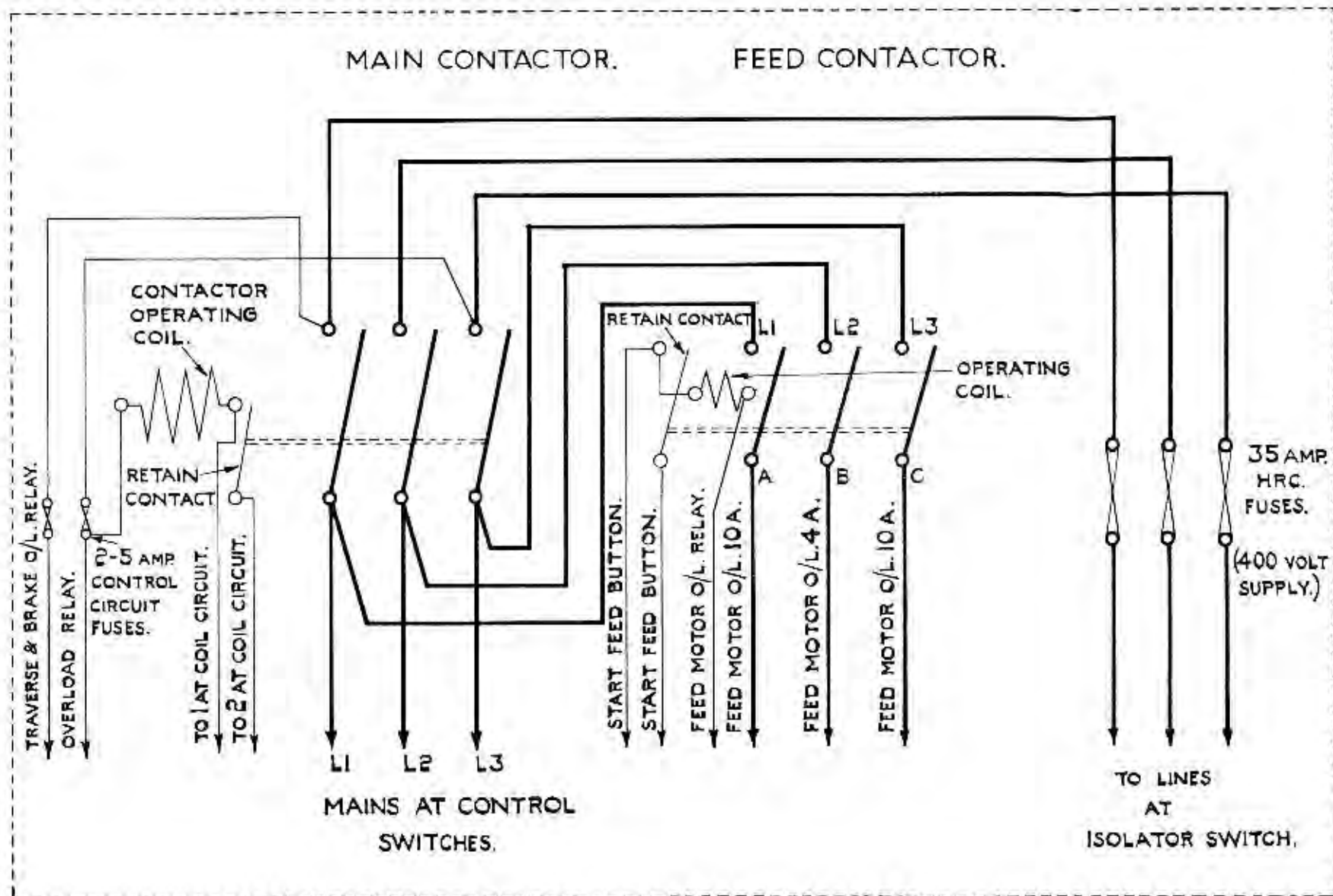
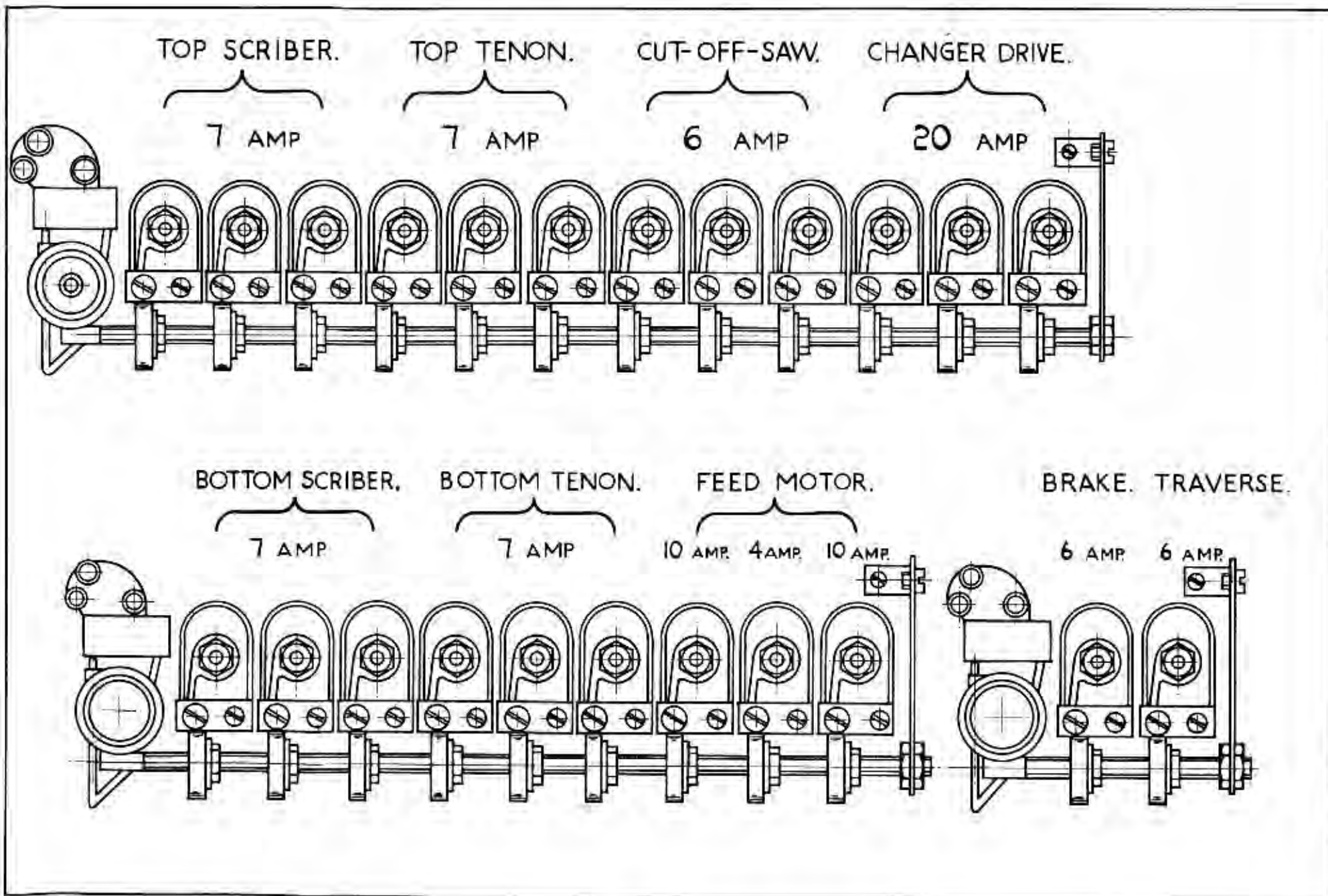
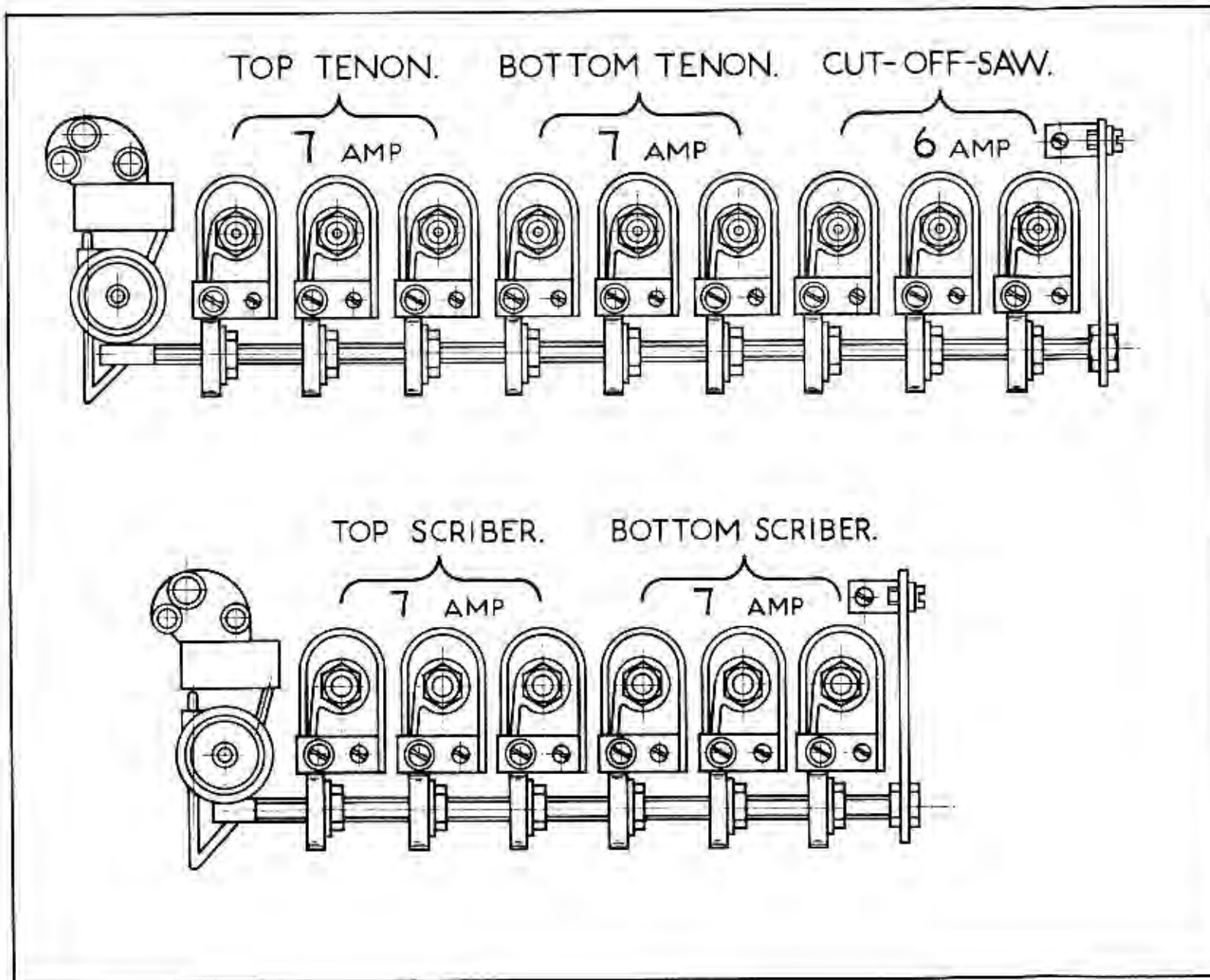


DIAGRAM OF CONNECTIONS AT CONTACTOR PANEL.



LAYOUT OF FIXED HEADSTOCK OVERLOAD PANEL.



LAYOUT OF MOVING HEADSTOCK OVERLOAD PANEL.

ELECTRICAL SPARES

BALL BEARINGS

POSITION ON MACHINE	MAKERS' No.	BORE (DIA.)	OUTSIDE DIA.	THICKNESS
Frequency changer, MZ.4826, drive end	Hoffman ball brg., MS.13V	1 1/8"	3 1/2"	1 1/8"
Frequency changer, MZ.4826, tail end	Hoffman ball brg., MS.12 1/2 V	1 3/8"	3 1/2"	1 1/8"
Frequency changer driving motor, K.4120, drive end	Hoffman roller brg., RMS.12 1/2	1 3/8"	3 1/2"	1 1/8"
Frequency changer driving motor, K.4120, tail end	Hoffman ball brg., MS.12 1/2	1 3/8"	3 1/2"	1 1/8"
Feed motor, CFST.4120, drive end	Hoffman roller brg., RMS.12 1/2	1 3/8"	3 1/2"	1 1/8"
Feed motor, CFST.4120, tail end	Hoffman ball brg., MS.12	1 1/4"	3 1/2"	1 1/8"
Traverse motor, KZ.3016, drive end	Hoffman ball brg., MS.10	1"	2 1/2"	1 1/8"
Traverse motor, KZ.3016, tail end	Hoffman ball brg., MS.10	1"	2 1/2"	1 1/8"

(For Headstock Bearings, see page 20.)

BRUSHES

Frequency changer, MZ.4826	Part No. SK.78/396
Feed motor, CFST.4120	Part No. SK.20/161

CONTACTS AND SPRINGS

Drum switch fixed contacts	Part No. MS.236, Items 60-65 inclusive
Drum switch roller contacts	Part No. SK.22203
Drum switch roller contact spring	Part No. SK.20764
Feed speed selector switch moving contacts	Part No. SK.690152-4
Feed speed selector switch fixed contacts	Part No. SK.1335412-1
Feed speed selector switch spring contacts	Part No. SK.1589734-1
Contactor main fixed contact	Part No. A.557
Contactor main moving contact	Part No. A.576
Contactor main contact spring	Part No. Ref. 50 pressure spring No. 3
Contactor retaining fixed contact	Part No. Ref. 50 aux. fixed contact No. 26
Contactor moving contact	Part No. Ref. 50 aux. moving contact No. 36
FEED CONTACTOR	
Stationary contact	Part No. Ref. 25 fixed contact
Moving contact	Part No. Ref. 25 moving contact
Contact spring	Part No. Ref. 25 butt. pressure spring (complete with cap)
Main braid	Part No. Ref. 25 braid

OVERLOADS

Feed overload	10 amp. No. D	Scriber Overload	7 amp. No. 5
Changer overload	20 amp. No. 6A	Rectifier overload	6 amp. No. 4
Tenon overload	7 amp. No. 5	Traverse overload	6 amp. No. 4
Cut-off saw overload	6 amp. No. 4	Feed B phase overload	4 amp. No. 8