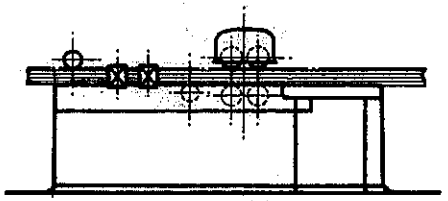
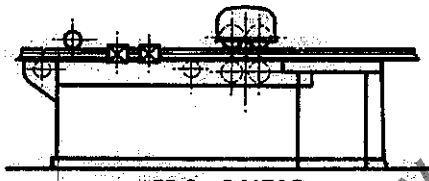
Wadkin

4" Planing and Moulding Machine, F.D.

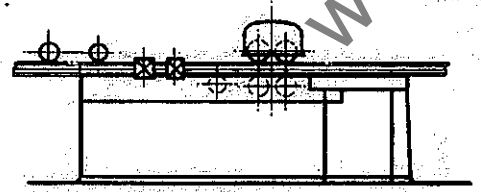
This machine is designed for planing and moulding timber up to a maximum finished size of 4" × 4". Maximum rough timber capacity of 4½" × 4½". Minimum length which can be machined, 11".
The following arrangements of cutter heads are available.



FD.1. 4-HEAD
FIRST BOTTOM HEAD ; FENCE SIDE HEAD ; NEAR SIDE HEAD ; AND TOP HEAD.



FD.2. 5-HEAD
FIRST BOTTOM HEAD ; FENCE SIDE HEAD ; NEAR SIDE HEAD ; TOP HEAD AND SECOND BOTTOM HEAD.



FD.3. 5-HEAD
FIRST BOTTOM HEAD ; FENCE SIDE HEAD ; NEAR SIDE HEAD; TOP HEAD; SECOND TOP HEAD.

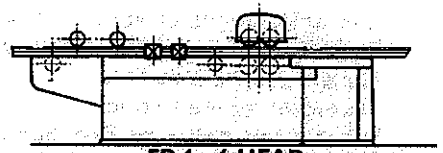
MACHINE CAN BE SUPPLIED WITH ANY SEQUENCE OF HEADS AS SHOWN.

FD.1 CAN BE CONVERTED AT ANY TIME TO FD.2, FD.3 OR FD.4.

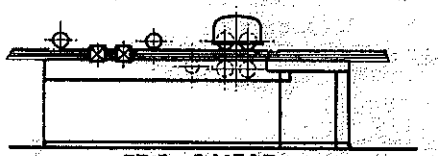
FD.2 CAN BE CONVERTED AT ANY TIME TO FD.3 OR FD.4.

FD.3 CAN BE CONVERTED AT ANY TIME TO FD.2 OR FD. 4.

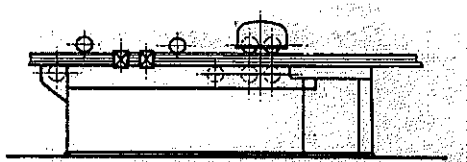
FD.5 CAN BE CONVERTED TO FD.6 ONLY.



FD.4. 6-HEAD
FIRST BOTTOM HEAD ; FENCE SIDE HEAD ; NEAR SIDE HEAD ; FIRST TOP HEAD ; SECOND TOP HEAD ; SECOND BOTTOM HEAD.



FD.5. 5-HEAD
FIRST BOTTOM HEAD ; FIRST TOP HEAD ; FENCE SIDE HEAD ; NEAR SIDE HEAD ; SECOND TOP HEAD.



FD.6. 6-HEAD
FIRST BOTTOM HEAD ; FIRST TOP HEAD ; FENCE SIDE HEAD ; NEAR SIDE HEAD ; SECOND TOP HEAD ; SECOND BOTTOM HEAD.

PRINCIPAL DIMENSIONS AND CAPACITIES

Maximum size of finished work	4″ wide × 4″ thick
Spindle motors	6 h.p. at 7,500 r.p.m.
Feed motors	3 h.p., 2,160/420 r.p.m.
Feed speeds	30, 35, 40, 45, 50, 55, 65, 75, 85, 95, 100 ft. per min.
Length of all cutterblocks	4¼″
Bore of cutterblocks for spindles	1¼″ diameter
Minimum cutting track	5½″ diameter
Maximum cutting track—First bottom head	6½″ diameter
All other heads	8″ diameter
End adjustment of vertical heads	¾″
End adjustment of horizontal heads	¾″
Centres of feed rollers	8″
Diameter of feed rollers	6″
Second top roller to first bottom head	12½″
Bottom head to fence side head	13″
Between side heads	9″
Near side head to top head	13½″
Top head to second bottom head (FD.2)	9″
Top head to second top head (FD.3)	14½″
Net weight	66 cwts.

DETAILS INCLUDED WITH THE MACHINE

All motors and control gear complete with wiring.
Frequency changer, control gear and wiring.
Main isolating switch and high rupturing capacity fuses.
One square cutterblock to each head, complete with collets, four cutterbolts, nuts and high speed steel cutters.
Exhaust hood to each head.
Feed-in table and covers.
Lubricating pump and tin of ball-bearing lubricant.

INSTALLATION

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

FOUNDATIONS

$\frac{5}{8}$" diameter foundation bolts should be used to bolt the machine down to the floor. If the mill floor consists of 6" solid concrete, no special foundation is necessary. Rag type holding down bolts may be used, and working from the foundation plan 6" to 8" square holes should be cut in the concrete for these bolts. After the machine has been carefully levelled and $\frac{7}{16}$" thick wood packing inserted underneath the "in-feed" table leg, it should be grouted in position with liquid cement.

WIRING

See page 26 for details and wiring diagrams.

DUST EXHAUST SYSTEM

The top and side cutter heads are fitted with efficient exhaust hoods, and the bottom cutter heads have chutes built in to the body of the machine ready for connection to the exhaust system shown in Fig. 1. The first bottom cutter head exhaust outlet measures $9\frac{3}{4}$" wide $\times 8\frac{3}{4}$" deep. The fence side head outlet measures $6\frac{1}{4}" \times 5"$, and the near side head outlet is 5" square. The top head outlets are $5" \times 4\frac{3}{4}"$, the 2nd bottom head outlet is $7" \times 3\frac{1}{2}"$.

Exhaust connection for top and side heads must have flexible connections.

Full particulars of a dust exhaust system specially designed for this machine by Messrs. Dallow Lambert and Co. Ltd. can be obtained on application to Wadkin Ltd.

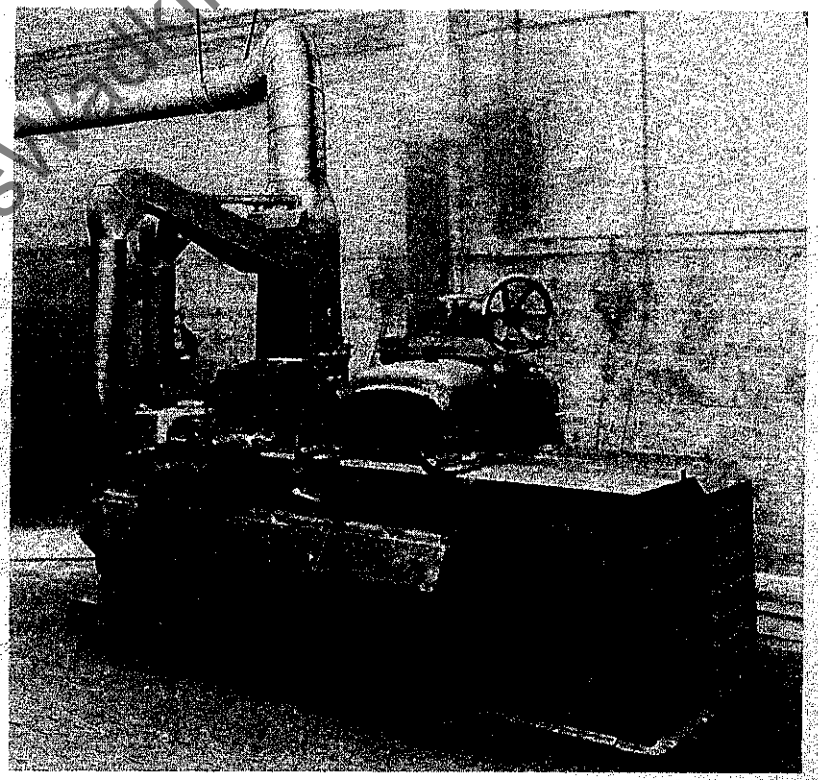


FIG. 1

FEED WORKS

A12 speed feed motor at 'A' driving by vee belts through a worm reduction box 'B' provides the drive for the feed works. The feed rollers above the bed are carried in independent swings, these being mounted on a vertical slide. The drive to these rollers is taken through a chain 'C' driven from the worm wheel shaft, the final drive to each roller being through spur gears.

The whole top roller swing assembly is mounted on a vertical vee slide which slides in the main feed works housing 'D'. The chain is automatically tensioned for all roller positions by means of an idler sprocket mounted on the vertical slide, and the whole drive runs in an oil bath. Provision is made for retensioning the chain, the adjustment being provided by a tightener sprocket mounted on an eccentric. By releasing the nut and turning the handle 'E' in the slot, the chain can be tightened, and finally by locking the nut the new position can be maintained.

The spiral gear box mounted at the top of the housing provides the drive for raising and lowering the feed roller slide by turning the handwheel 'F'. This allows the top roller assembly to be adjusted for various thicknesses of timber. The swings have independent adjustment by turning the handwheels 'G'. This independent adjustment is provided by compression springs and allows for a variation in timber thickness up to a maximum of $\frac{1}{2}$" without altering the main roller setting.

The "feeding-in" table and feed works housing are $\frac{5}{16}$" below the level of the main machine table. The bottom feed rollers are driven by spur gears from the worm shaft, the gears running in oil. Rollers are mounted in separate trunnions and coupled together by link motion. By rotating the handwheel, Fig. 10, the rollers can be adjusted $\frac{1}{16}$" above this level to $\frac{1}{4}$" below. This adjustment can be carried out when the machine is running. The first rollers top and bottom are serrated and the following two are smooth. Pressure lubrication is provided to all feed works bearings and the system is fully described on page 21.

To adjust the tension on the feed drive vee ropes, the nuts on the tensioning screw, Fig. 7, should be slackened off, readjusted and locked up in the new position. Should any replacement vee rope belts be required a complete set of four No. 51A ropes should be fitted, otherwise the pull will not be equal on each rope.

A timber guard is fitted at 'H' which can be adjusted to any desired thickness of timber. A scale is fitted on the stationary feed works housing, with a pointer mounted on the top roller cover to give direct reading for the roller setting. A cavity under the feed works housing, terminating in a chute, discharges chips and dust which would otherwise clog the feed rollers.

The frequency changer drive is adjusted in a similar manner to the feed motor, the tensioning screw is shown at 'J', Fig. 2. A complete set of four No. 46B vee ropes should be fitted as replacements.

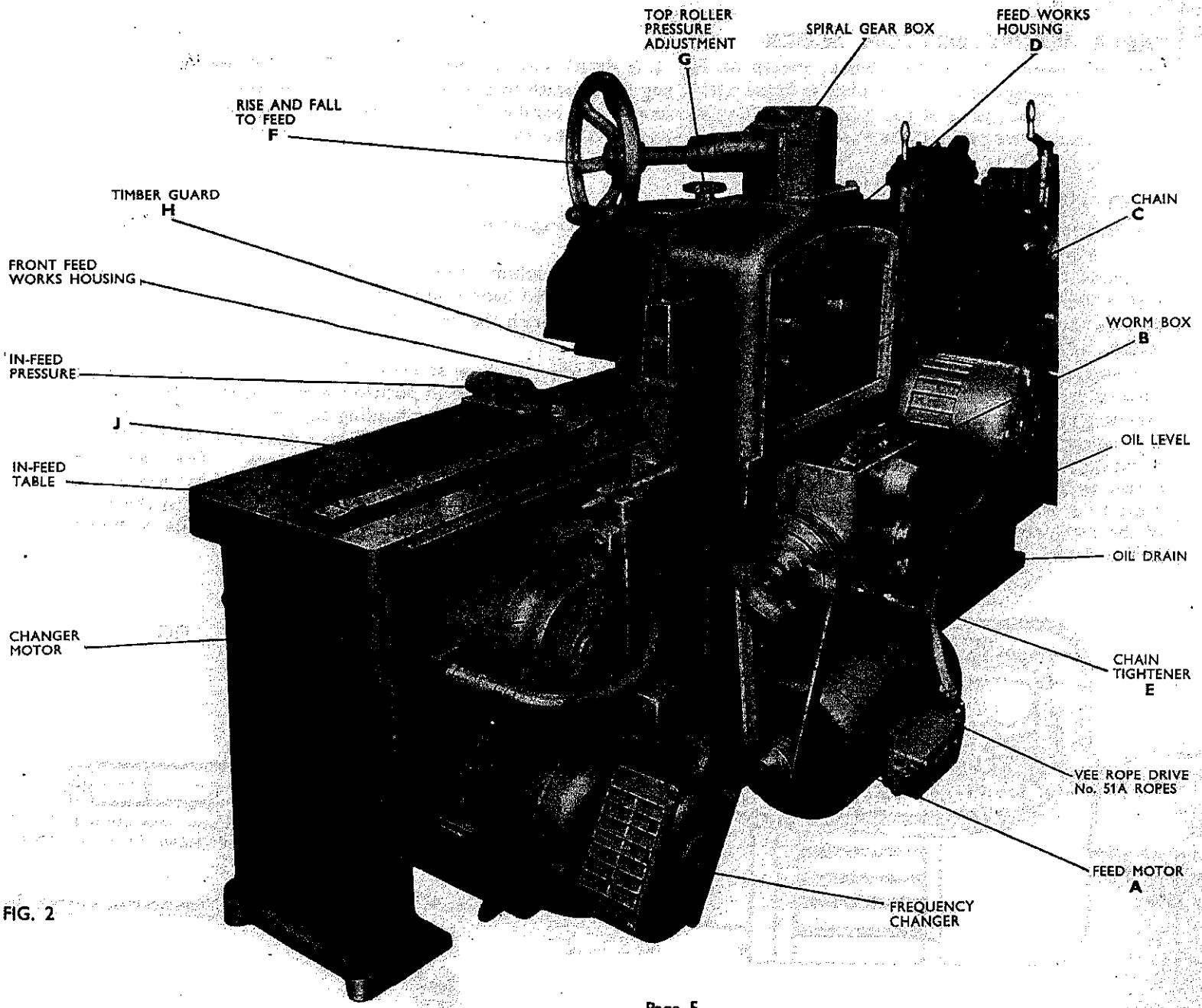


FIG. 2

TABLE BEFORE BOTTOM BLOCK

The table before the bottom block, shown on Fig. 4, is fitted with a renewable and hardened bed plate, firmly clamped by wedge action. The plate is fitted with a peg underneath to prevent any movement towards the cutters. The vertical movement of the table is obtained by turning the handle 'A' which operates an eccentric shaft. The nut 'B' clamps the table in the vertical position. The table can be adjusted between $\frac{1}{16}$" above the main table level down to $\frac{1}{4}$" below.

FIRST BOTTOM BLOCK

The first bottom cutter spindle is mounted on a vertical slide, the spindle barrel being locked in a cylindrical housing on the slide by means of a split grip and nut 'C', Fig. 4.

The slide unit complete fits on the square ways of the vertical column and is raised or lowered on this column with a square ended elevating screw by means of the loose cranked handle provided.

To lock the spindle slide in its vertical position a stud passes through the vertical column and locks the face of the column to the spindle slide with the nut 'E', Fig. 4.

The hinged door 'F' in front of the cutterblock can be swung open to allow access to the cutterblock for changing cutters, etc. The cutterblocks are mounted direct on the spindle and held in position with a taper centring collar against a taper shank. The end of the cutter spindle has two flats provided for holding the spindle stationary with a $\frac{1}{2}$" hexagon spanner while locking up the nut. Cross adjustment to the spindle is by means of a ratchet lever. A maximum distance of $\frac{3}{8}$" can be obtained between the fence and the edge of the cutterblock. The maximum cutter track on this head is $6\frac{1}{2}$" diameter, the minimum $5\frac{1}{2}$" diameter, with a maximum distance of $3\frac{3}{8}$" below the table level to the centre line of the spindle. Chips are exhausted through a chute in the main frame to the back of the machine. This should be connected to an exhaust system. A section through the cutter spindle is shown at Fig. 3 and should be studied in conjunction with the lubrication instructions on page 21.

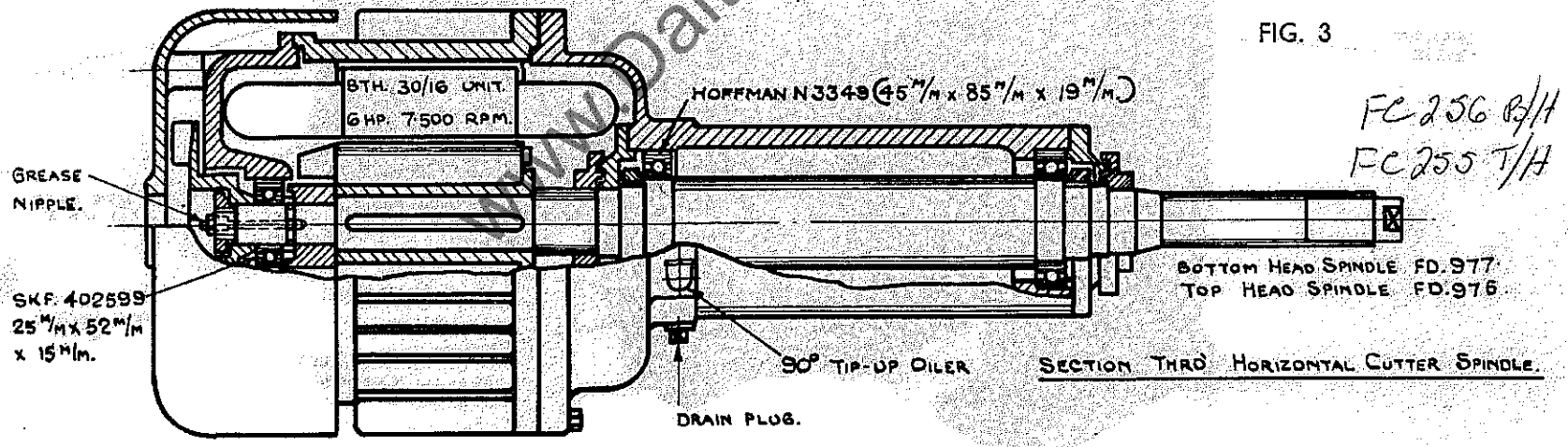


FIG. 3

SECTION THRO HORIZONTAL CUTTER SPINDLE.

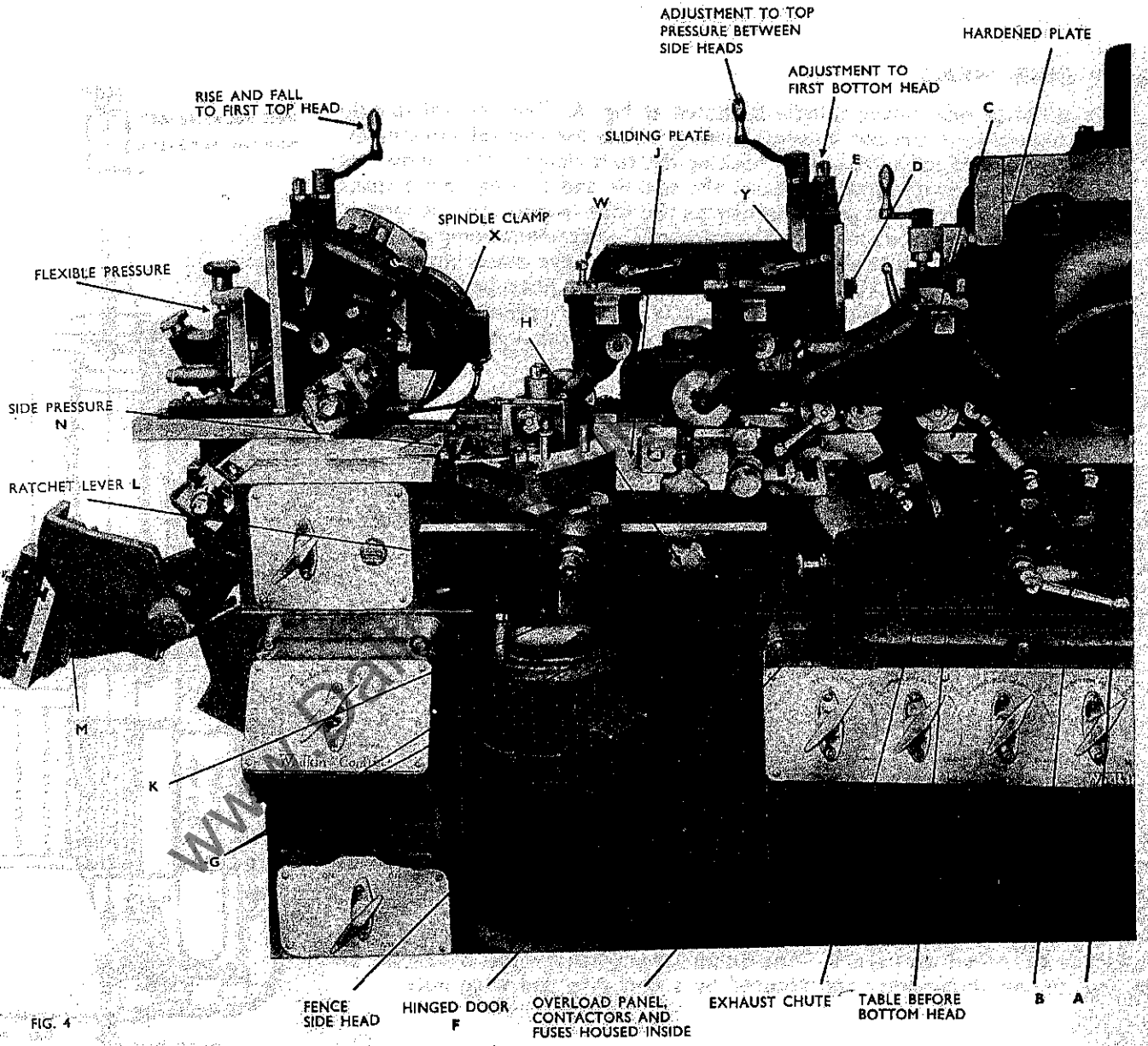


FIG. 4

FENCE SIDE HEAD

The vertical fence side cutter spindle is shown at Fig. 4. The vertical spindle barrel is clamped in a circular housing forming a slide for vertical adjustment. The barrel is clamped with the nut 'G' locking the split clamp. The handwheel 'H' operates the cross traverse motion to the spindle and a bridge piece spans the slide underneath ; the hexagon nut clamps the slide in position. A ratchet lever provides vertical adjustment to the spindle, $\frac{3}{8}$" movement being obtained above or below the table level to the bottom edge of the cutterblock. To maintain a flush table level a sliding plate 'J' is fitted, the plate being cut away to give the minimum clearance between the plate and cutter track. Two hexagon nuts underneath the slide lock the plate in position, the slide being slotted to allow for the movement.

The maximum cutter track on this head is 8" diameter with a minimum of 5" diameter. Two pegs are fitted to the table for rapid positioning of the

A renewable and hardened bed plate, clamped by wedge action, is fitted between the first bottom head and the fence side head, adjustment being allowed in the plate length to accommodate varying cutter tracks on the first bottom head.
The distance between the first bottom head and the fence side head is 13".
A section through the vertical cutter spindle is shown at Fig. 5, this drawing should be studied in conjunction with the lubrication instruction on page 21.

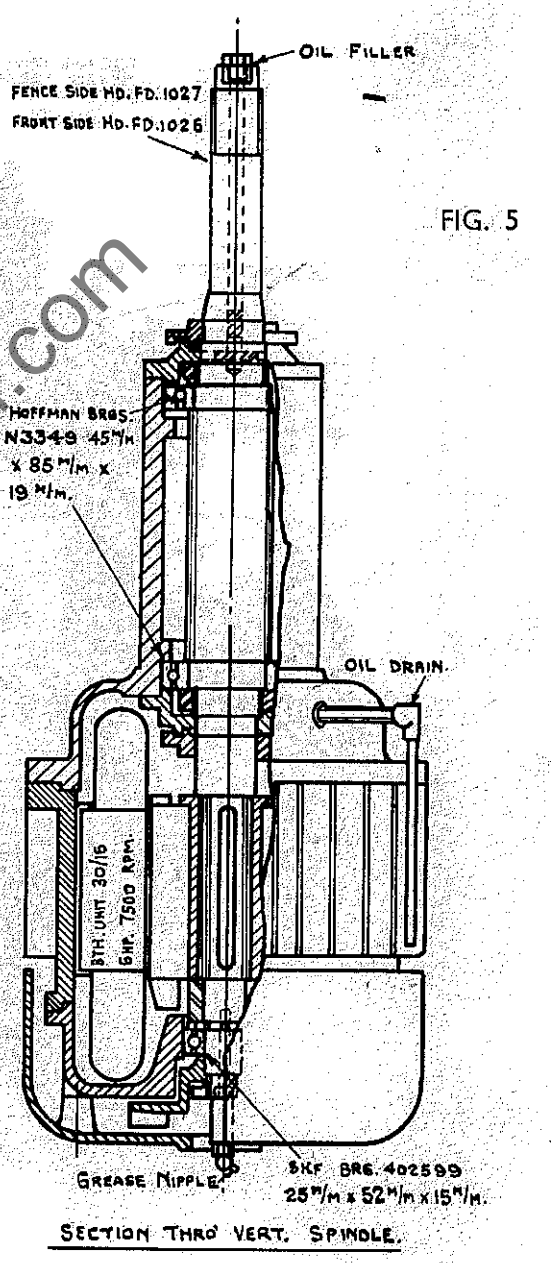


FIG. 5

SECTION THRO' VERT. SPINDLE.

FRONT SIDE HEAD

The vertical cutter spindle unit at the front side head is mounted and adjusted in a similar manner to the fence side head. Cross adjustment is provided by the handle 'K', Fig. 4. The plate, for maintaining the maximum table surface, slides and is locked in exactly the same manner as on the fence side head. The same method of cutterblock mounting is used on the vertical spindles as on the horizontal spindles. A maximum vertical adjustment of $\frac{3}{4}$", $\frac{3}{8}$" above or below the table level, is obtained with the ratchet lever 'L', Fig. 4. The side heads are staggered 9". The front side head is fitted with a swing away chip-breaker as described on page 9. The aluminium exhaust hood is located on two pegs in the chipbreaker and secured by a split grip and wing nuts

FRONT SIDE HEAD CHIPBREAKER

A diagram of the front side head chipbreaker is shown at Fig. 6. The swinging arm 'A' is pivoted at point 'B', the pivot being fastened to the side head slide and so moving with the side head adjustment. Two square slideways on the swinging arm form the bearing surface for the shoe which slides in a horizontal direction along these ways. The stud 'C' and nut locks the shoe in position and the whole unit is secured with the spring and stud attached to the front pressure after the bottom block. The spring provides the tension when the chipbreaker kicks back under the load. To release the spring it is only necessary to slacken the fluted handwheel 'D' and lift the long stud up, the whole chipbreaker arm can then be swung clear to obtain access to the cutterblock.

FIG. 6

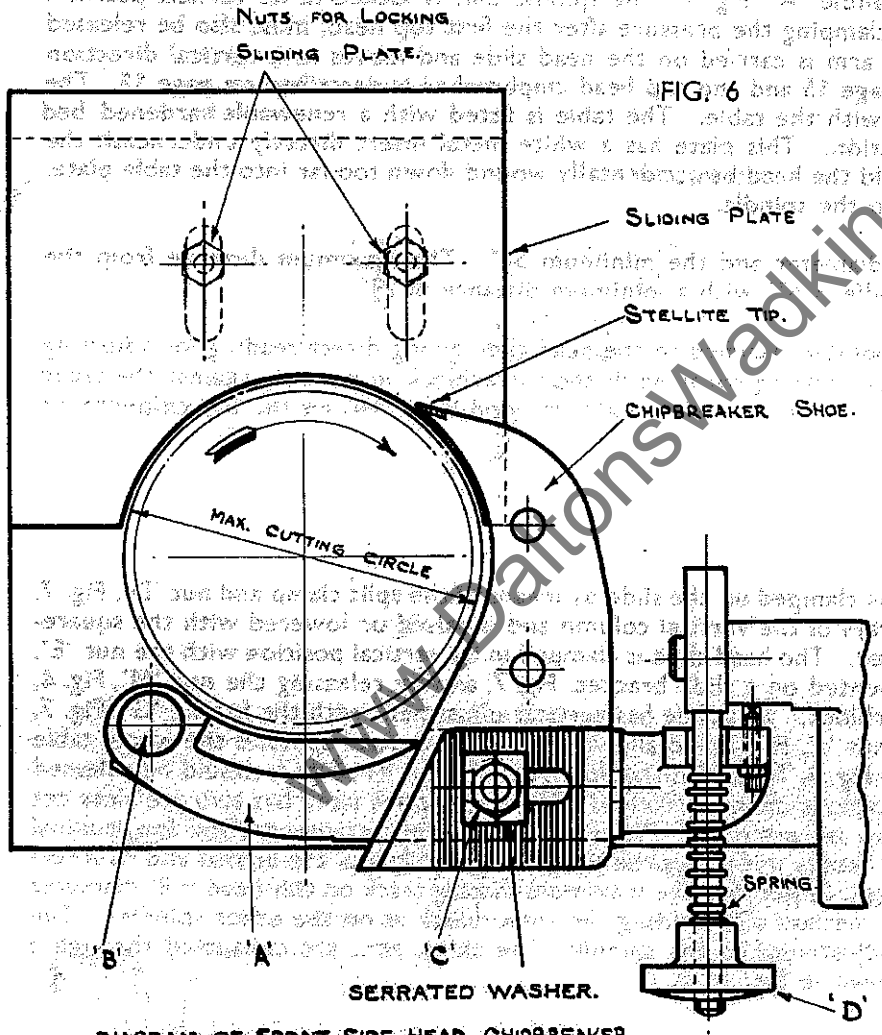


DIAGRAM OF FRONT SIDE HEAD CHIPBREAKER.

Chipbreaker shoe is serrated and locking bolt "C" is fitted with a serrated washer; prevents the chipbreaker sliding into the cutters.

The hinged stud has been designed so that it is impossible to throw the adjusting handwheel over into the fence side head.

FIRST TOP HEAD

The first top head cutter spindle is mounted on a square slide, the spindle barrel fitting in a cylindrical housing locked in position by the split grip and nut 'X', Fig. 4.

The slide unit complete fits on the square ways of the vertical column, and is raised or lowered with the square ended elevating screw fitted with removable handle 'A', Fig. 7. The spindle unit is locked in its vertical position with the nut 'B', Fig. 7, but the nut 'C', Fig. 7, clamping the pressure after the first top head, must also be released before the head can be moved. This pressure arm is carried on the head slide and moves in a vertical direction with the head. The pressure is described on page 15 and the top head chipbreaker is described on page 12. The column for the top head is made in one piece with the table. The table is fitted with a renewable hardened bed plate firmly gripped in position with wedge action. This plate has a white metal insert directly underneath the cutter track to avoid damage to the cutter should the head be accidentally wound down too far into the table plate. A ratchet lever provides $\frac{3}{4}$" cross adjustment to the spindle.

The maximum cutter track on this head is 8" diameter and the minimum $5\frac{1}{2}$". The maximum distance from the table level to the centre line of the cutter spindle is $6\frac{7}{8}$" with a minimum distance of $2\frac{3}{4}$".

A scale is fitted on the vertical column with a pointer attached to the head slide giving direct reading for adjusting the cutter head. As on all other spindles a taper centring collar holds the cutterblock in position against the taper shank, with a nut clamping the block in position. The aluminium exhaust hood is carried on the top chipbreaker arm held by two pegs.

SECOND BOTTOM HEAD

The spindle unit for the second bottom head is clamped on the slide by means of the split clamp and nut 'D', Fig. 7. This slide unit complete slides on the square ways of the vertical column and is raised or lowered with the square-ended screw 'F', Fig. 7, using the handle provided. The head slide is clamped in its vertical position with the nut 'E'. The table after the second bottom head is mounted on a slide bracket, Fig. 7, and by releasing the nut 'M', Fig. 4, can be moved towards or away from the cutterblock. This slide has vertical adjustment with the handle 'G', Fig. 7, and is locked in its vertical position with the nut 'J', Fig. 7. To allow access to the cutter spindles the whole table unit swings away from the machine as shown in Fig. 4. To do this the fluted handwheel 'H', Fig. 7, should be released and the eyebolt swung out of position. The table is counterbalanced. The table plate itself has two tee slots cut in the width and two short independent fences are provided. These fences slide in a transverse and longitudinal direction, the tee bolts 'K', Fig. 7, locking the fences in the desired position. Both fences are drilled and countersunk to suit wood screws to take wood packings if required. The maximum cutting track on this head is 8" diameter and the minimum $5\frac{1}{2}$" diameter with the same method of mounting the cutterblock as on the other spindles. The ratchet lever shown at Fig. 7 gives $\frac{3}{4}$" cross adjustment to the spindle. The chips, etc., are exhausted through a chute fitted to the end of the machine as shown in Fig. 7.

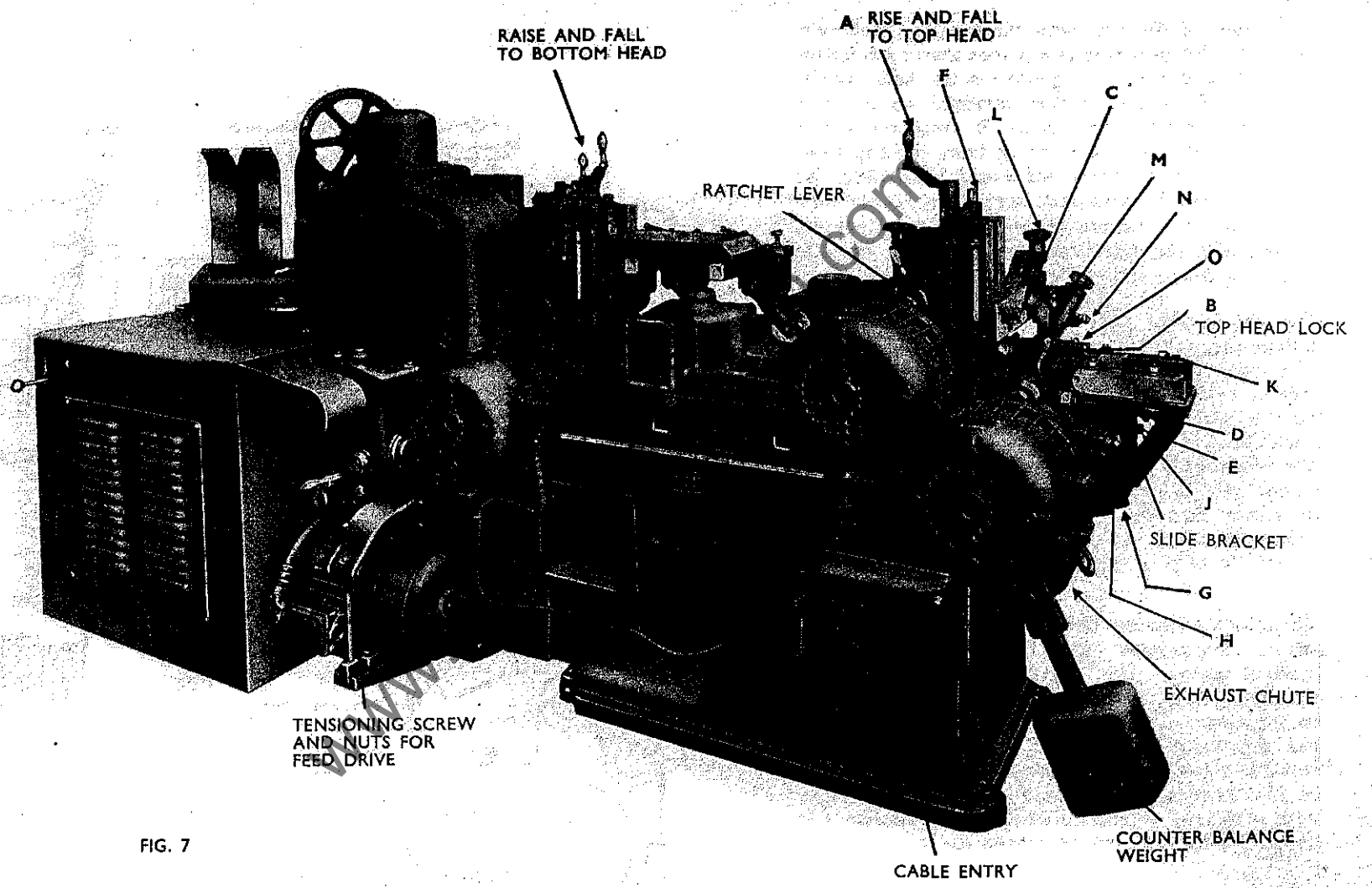


FIG. 7

TOP HEAD CHIPBREAKER

A diagram of the top head chipbreaker is shown at Fig. 8. The swinging arm pivots about a fulcrum point 'A' and the arm is guided in its radial movement by the guide bracket attached to the top head unit, and the keep plate 'B' fastened to the swinging arm. A stud pivoting from the top head unit fitted with a spring and fluted handwheel fits in a slot on the arm and keeps the whole unit down, while a square head screw and locknut tapped into the top head unit prevents the arm dropping down into the cutter.

The chipbreaker unit "C" is fitted with two independent shoes, both shoes pivoting at "D." The unit slides along a slot in the arm, and is locked in position with serrated washer and nut "E" at the back of the arm.
Each shoe is fitted with a spring and these springs are adjusted with the locknuts 'F'. A square head screw and locknut is provided above the spring adjusting nuts at 'G', to limit the amount of movement back of each shoe. In operation an initial lift of $\frac{1}{8}$" is obtained on each shoe.

Variations in excess of this are controlled by the whole chipbreaker unit swinging against the control spring. The whole chipbreaker unit can be swung away from the cutterblock for access to the cutters. A spring loaded plunger fitted to the top head unit can be pushed forward and turned to enable the peg to move from the groove on the boss to the face and so lock the plunger with sufficient projection extending from the unit to enable the arm to be rested on it.

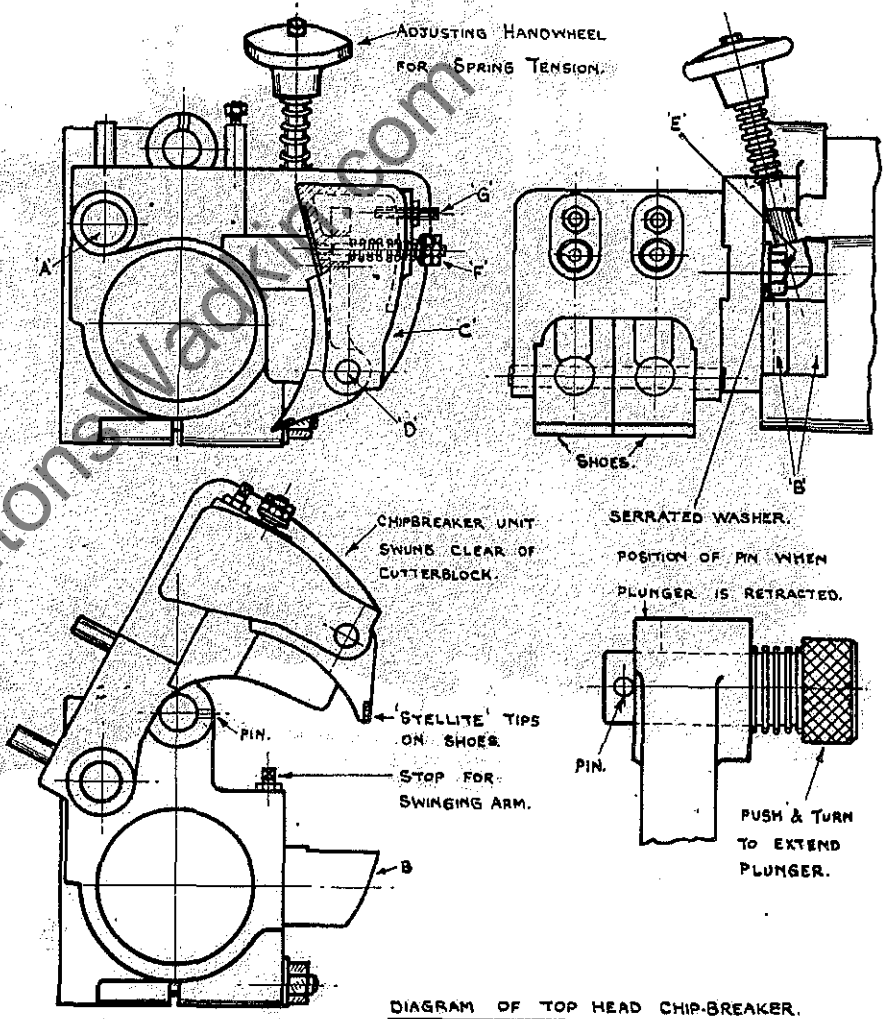


FIG. 8

DIAGRAM OF TOP HEAD CHIP-BREAKER.

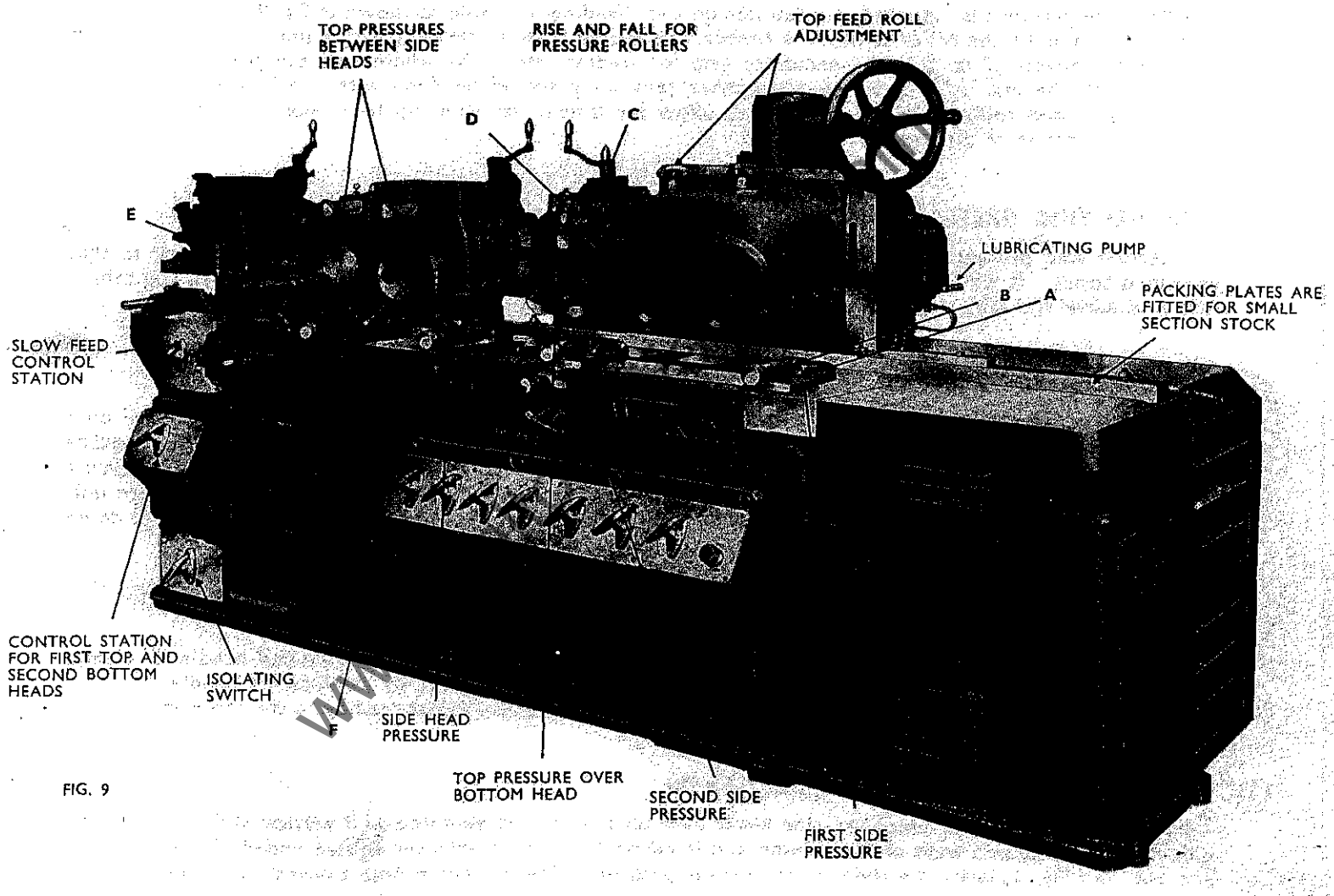


FIG. 9

PRESSURES

(1) FIRST SIDE PRESSURE ON "FEEDING-IN" TABLE

The first side pressure is mounted in a tee slot on the "feeding-in" table as shown at Fig. 9. The whole unit slides forward until the roller strikes the timber, and should then be moved forward until the roller swings back approximately $\frac{1}{4}$" to give the necessary grip for feeding, etc. The whole unit can then be locked in position with the nut 'A', Fig. 9, and any further tensioning should be done with the knurled handle 'B'. The spring loaded roller is flexible enough to allow for timber variation up to a maximum of $\frac{3}{4}$" without altering the setting of the pressure unit.

(2) SECOND SIDE PRESSURE BEFORE BOTTOM HEAD

The second side pressure slides in the tee slot as shown in Fig. 9 and all adjustments are similar to that described above. It will be noted that this roller is thinner than the others and does not touch the table ; this is to allow the table before the bottom block to be raised to its top position.

(3) TOP PRESSURE OVER FIRST BOTTOM HEAD

The double roller pressure over the bottom head is shown at Fig. 9. It is a flexible pressure mounted on a square bar to enable the pressure unit to be moved in or out to suit various widths of timber. The square bar is secured to a bracket mounted on the top feed roller cover, so that it is automatically set to the correct timber thickness with the adjustment to the feed rollers. The two ball handle 'C' clampsthe pressure unit in position on the square bar and by rotating the handwheel 'D' the pressure rollers can be moved up or down to give additional tension.

(4) SIDE HEAD PRESSURE (AFTER FIRST BOTTOM HEAD)

The roller pressure shown in Fig. 9 is slotted for cross adjustment and the small two-ball handle 'E' clamps the pressure in position. Tension to the spring and roller arm is provided by the knurled handle 'F'. This pressure moves automatically with the head and a scale is fitted to give direct reading to the cross adjustment.

(5) TOP PRESSURES BETWEEN SIDE HEADS

The two pressure units between the side heads slide on square bars mounted on a vertical slide, Fig. 4. This slide fits on the square ways of the column and is raised or lowered with the square ended elevating screw. The nut 'D', Fig. 4, locks the slide in its vertical position. The pressures slide towards or away from the

front of the machine and are locked in position with the handle 'Y', Fig. 4. $\frac{3}{4}$" adjustment by spring tension to the rollers can be obtained and the springs can be tensioned by turning the hexagon head screw 'W', Fig. 4, to the correct tension and relocking the nut. The rollers are mounted in independent swings and held in position with grub screws. The rollers can be removed and timber finger pieces can be placed in the same arm for use on narrow stock.

(6) FOURTH SIDE PRESSURE

The fourth side pressure is clearly shown at 'N', Fig. 4, and moves with the front side head adjustment. The pressure unit is slotted and independent adjustment can be obtained by releasing the hexagon nut. The front face of the pressure unit is drilled for two wood screws to fasten hardwood packing pieces to form the pressure face.

(7) TOP FLEXIBLE PRESSURE AFTER FIRST TOP HEAD

The top pressure is carried from the arm attached to the top head as shown at Fig. 7. Horizontal adjustment is obtained by releasing the locknut 'C', Fig. 7. Vertical adjustment is obtained by rotating the fluted hand-wheel 'L', Fig. 7, the vertical pressure link being slotted to give this movement. The nut 'M', Fig. 7, clamps the link in position. The shoe is held in position at 'N', Fig. 7, by a stud and nut. The pressure shoe can be canted to accommodate bevelled stock. A loose steel plate is fitted underneath the shoe and a hardwood packing piece is attached to this plate, the plate then being fastened underneath the shoe with studs and nuts 'O', Fig. 7.

(8) SIDE PRESSURE FOR SECOND TOP HEAD

On the FD.3 and 4 machines with two top heads, two side pressures are fitted to the "feeding-out" table. These pressures consist of a bracket fastened to the table with a pressure plate and stem, sliding in the bracket. The plates are drilled to enable wooden packing pieces to be fitted. The stems are locked in position with the two ball handle.

(9) SEE PAGE 36 FOR SPECIAL PRESSURES WHICH CAN BE SUPPLIED FOR SMALL STOCK

FENCES

(1) FENCE BEFORE FEED ROLLERS

The fence on the "feeding-in" table before the feed rollers is attached by a plate to the fence over the feed rollers and first bottom block, and is adjusted with it.

(2) FENCE OVER FEED ROLLS AND FIRST BOTTOM BLOCK

This fence is fitted with two links and can be moved in or out $\frac{5}{16}$". The nuts at 'A', Fig. 10, should be slackened and the whole fence moved into the desired position and the nuts relocked. The fence on the "feeding-in" table being attached to this one moves with it and a further locking nut is provided. The link mechanism ensures that the adjustable fence is parallel to the main fence.

(3) FENCE BEFORE FENCE SIDE HEAD

This fence is fitted with a sliding nose-piece to support the timber as close to the cutter as possible. This shoe, as shown on Fig. 11, is slotted to allow movement towards or away from the cutter and is clamped with the hexagon head-screw 'A', Fig. 11.
Nose piece is fitted with serrated washer to prevent nose sliding into cutters.

(4) FENCE AFTER NEAR SIDE HEAD

This fence slides towards the fence side head to give the maximum fence bearing surface when cutting with small diameter cutter tracks.

To allow for this movement the clamping bracket 'B', Fig. 11, is slotted and the two lock nuts 'C', Fig. 11, are used to lock this fence in position. The fence is tongued and slides in a groove cut in the clamping bracket, thus maintaining alignment.

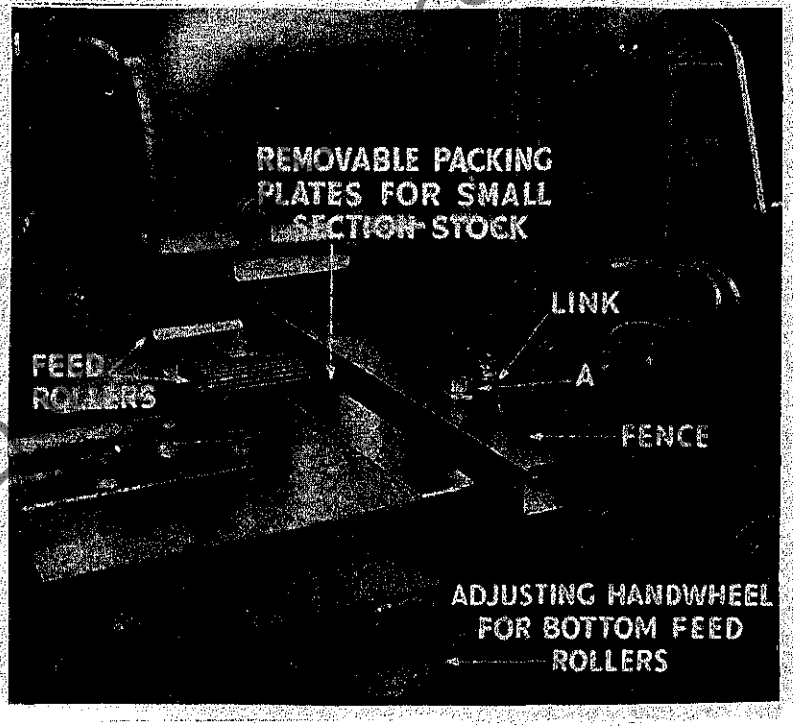


FIG. 10

(5) FENCE UNDER FIRST TOP HEAD

This fence is dowelled in position as it supports the timber during the finishing cut. It is cut away under the top head to allow the head to be brought down for the smaller cutter tracks.

FIG. 11

ADDITIONAL SPECIAL EQUIPMENT

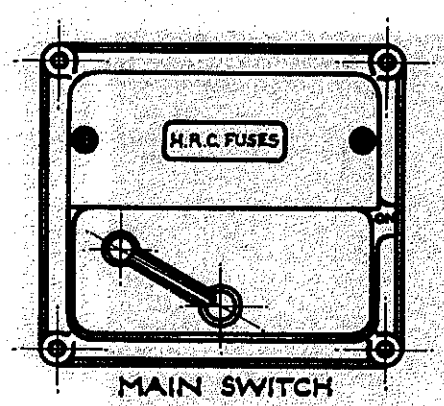
FEED ROLLERS

In place of the normal top rollers, fluted or plain, rubber covered rollers can be supplied to special order.

PRESSURES BETWEEN SIDE HEADS

Narrow pressure rollers are for small stock. These rollers are complete with arm brackets and the brackets can be fitted into existing sockets on the sliding pressure brackets.

OPERATING INSTRUCTIONS FOR ELECTRIC CONTROLS



MAIN SWITCH

Fig. 12

The main isolating switch is situated at the "feeding-out" end of the main frame near the floor, and is engraved as shown at Fig. 12. When the handle is in the "OFF" position, the electrical gear on the machine is completely isolated, so before any cutter heads, etc., can be started the switch must be turned to the "ON" position. Note, neither the feed or the headstocks can be started unless all the switches (except the mains switch) are in the "OFF" position, and the master stop buttons are free.

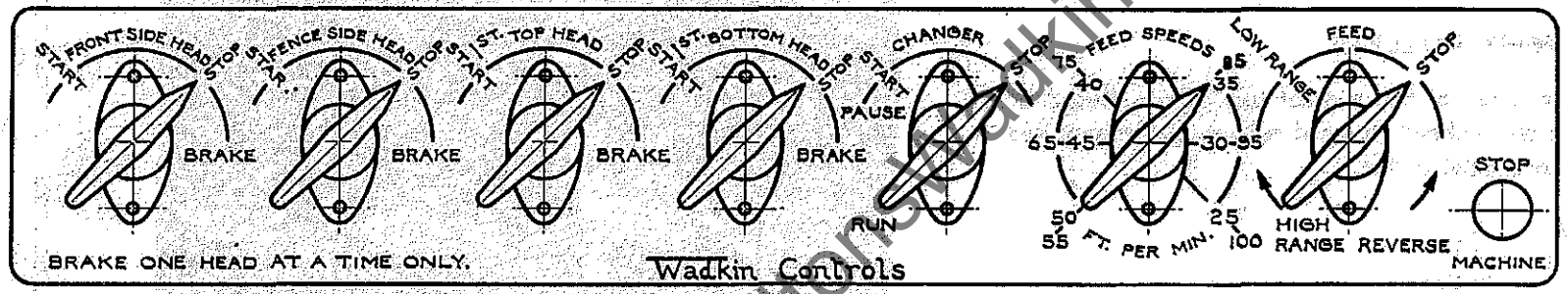


Fig. 13

MAIN CONTROL STATION

The Control Station at the " feeding in " end of the machine is shown in Fig. 13; the feed control switch is the first switch on the right hand side of the panel. By turning the switch handle from " Stop " to " Low Range " the feed rollers run at the speed selected from the inner markings on the Feed Selector Switch. Then by turning the feed control switch to the " High Range " position, the rollers rotate at the speed selected from the outer markings on the Feed Selector Switch. Should it be required to reverse the feed rollers, the feed control switch should be turned to the " Reverse " position when the feed rollers will rotate in the opposite direction.

FEED SELECTOR SWITCH

The Feed Selector Switch is the second switch from the right hand end of the panel as shown in Fig. 13. The dual feed speeds range from 25 to 50 or 55 to 100 feet per minute and the method of selecting the range is described above. The switch handle should be turned until the pointer registers the desired feed speed. The feed can be altered when the machine is running, but care must be taken to ensure that the pointer accurately registers on the speed selected.

FREQUENCY CHANGER SWITCH

The Frequency Changer Switch is the third switch from the right hand end of the panel as shown in Fig. 13. This switch controls the frequency changer current to the cutter heads and must be started before any cutter heads can be run. The handle is turned from the " OFF " position over to " START," held there for a few seconds to enable the changer to build up speed and then moved over to the " RUN " position.

NOTE.—The changer switch will not operate until the main switch is " ON," the stop buttons unlocked and all the other controls in the " OFF " position.

CUTTER HEAD SWITCHES

The remaining switches on the main panel control the cutter heads to the 1st Bottom, 1st Top, Fence side and Front side heads respectively. The heads are started by turning the switch handle from " Stop " to " Start." To brake any head, turn the switch to the " Brake " position, hold it there until the spindle stops, then release the handle when it will automatically return to the " Stop " position. It should be noted that only ONE spindle should be braked at a time. On the extreme right hand end of the panel is fitted a " Master Stop " button which when operated stops the machine. This button is fitted with a lock and can be pushed in and half turned to lock the button in the " OFF " position thus rendering all the controls inoperative. It should be employed to prevent accidental starting when leaving the machine or when attending to the cutterblocks.

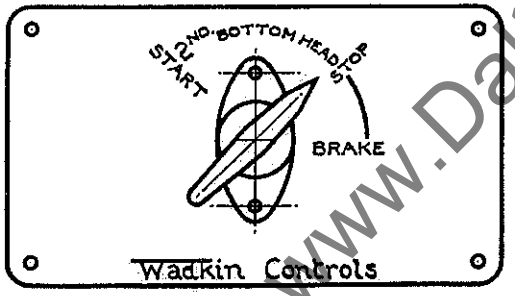


Fig. 14

CONTROL STATION FOR 5 HEAD MACHINES

The control panel shown in Fig. 14 is used when only 5 heads are fitted. The method of operation is identical to the other cutter head switches. This panel is situated at the " feeding out " end of the machine.

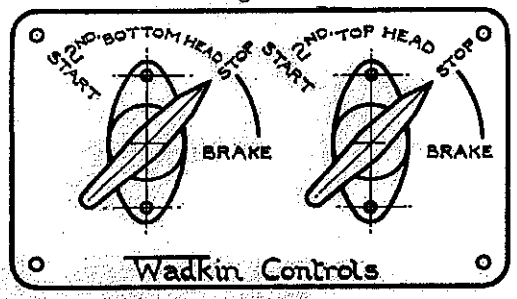
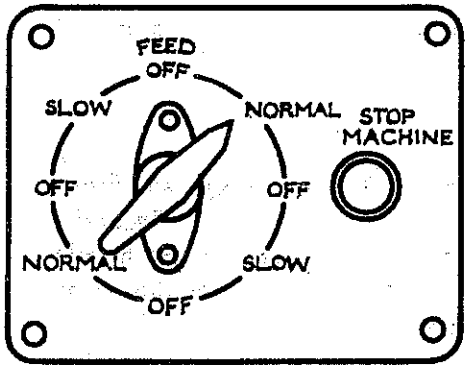


Fig. 15

CONTROL STATION FOR 6 HEAD MACHINES

The control panel shown in Fig. 15 is used when 6 heads are fitted. The method of operation is again identical to the other cutter head switches. This panel is situated at the " feeding out " end of the machine.

INSTRUCTIONS FOR ELECTRIC CONTROLS (continued)



FEED CONTROL STATION
"FEEDING-OUT" END. FIG. 16

FEED CONTROL AT "FEEDING-OUT" END ON MACHINES

The feed control station is built into the top head stand as shown in Fig. 9, the control panel being engraved as shown in Fig. 16. The switch controls the feed rollers by turning the handle. In the "SLOW" position the slowest feed is selected and by turning the handle to "NORMAL" the feed rollers run at the speed selected on the selector switch, this is useful when setting up. An additional master stop button is provided on the panel, Fig. 16.

LUBRICATION INSTRUCTIONS

FEED WORKS

The feed rollers and feed works bearings are lubricated by a hand pump situated on the vertical feed works housing, Fig. 10. Pipes are taken from this pump to the top roller swings and swing bearings, wormwheel shaft bearings and idler sprocket bearings. Flexible pipes are taken to the front and rear bottom feed roller trunnions. By giving the pump handle six depressions daily, each bearing automatically receives its correct amount of oil. The top roller swing hinge pins are fitted with oil cups and every three months the top feed roll front cover should be removed and these oil cups filled with Wadkin grade 4 oil. The chain drive picks up oil from the sump in the feed works housing and the sump should be filled to the oil level weekly, using Wadkin grade L2 oil. The filler, oil level and drain plug are shown at Fig. 17. The worm gear runs in an oil bath, and the worm box oil level should be "topped up" weekly to the oil level shown at Fig. 17, using Wadkin grade L2 oil. The bottom feed roller gears are oil lubricated using Wadkin grade L4 oil at point 'D', Fig. 17. The spiral gear box on the feed works housing for raising and lowering the top feed rolls is fitted with a 90 degree tip up oiler and the oil level should be checked weekly and "topped up" if necessary to the top of the oiler, using Wadkin grade L4 oil. The tip up oiler on the handwheel shaft boss requires three to four drops of Wadkin grade L4 oil weekly.

IMPORTANT

CUTTER SPINDLES

The horizontal cutter spindles must be lubricated daily. Fill to the top of oil cup shown in Fig. 3 with Wadkin grade L1 oil and give one depression of the grease gun weekly to the nipple at the motor end of the spindle, using Wadkin grade L.6. grease. A drain plug is fitted under the oil cup to drain away surplus oil. The vertical cutter spindles shown at Fig. 5 should be lubricated by removing the plug marked "OIL" at the top of the spindle and filled daily with Wadkin grade L1 oil. A pipe is fitted to the vertical heads to drain away surplus oil. Give one depression of the grease gun weekly, using Wadkin grease grade L.6. to the nipple at the motor end of the cutter spindle.

LUBRICATION CHART

POINTS "A" Give 3 to 6 charges of grease gun weekly using Wadkin grease, Grade L.6.
POINTS "B" Oil weekly, 3 to 4 drops Wadkin oil, Grade L.4.
POINTS "C" Check oil level weekly and fill to oil level using Wadkin oil, Grade L.2.
POINTS "D" Oil every 3 months using Wadkin oil, Grade L.4.

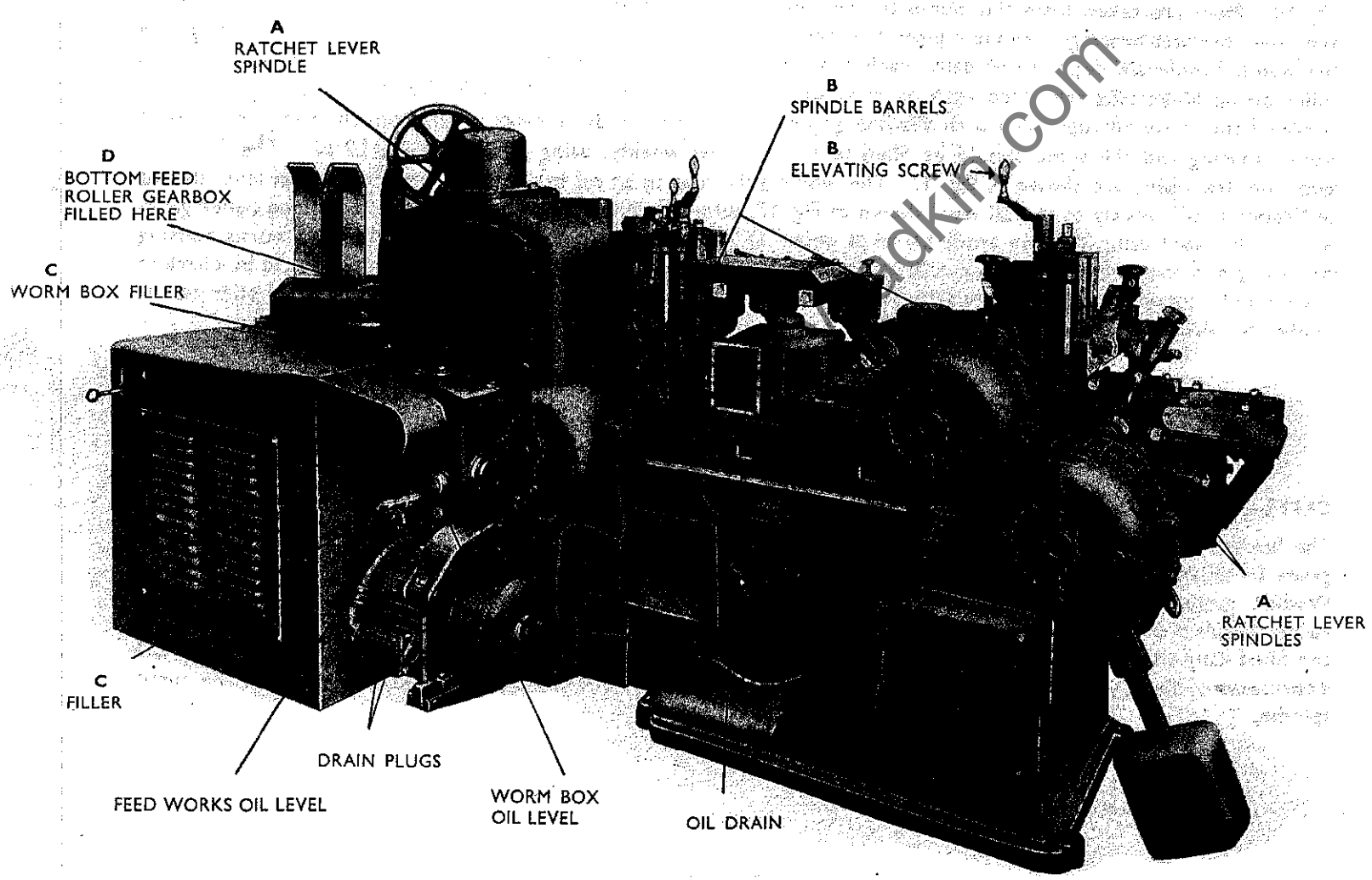


FIG. 17

LUBRICATION CHART

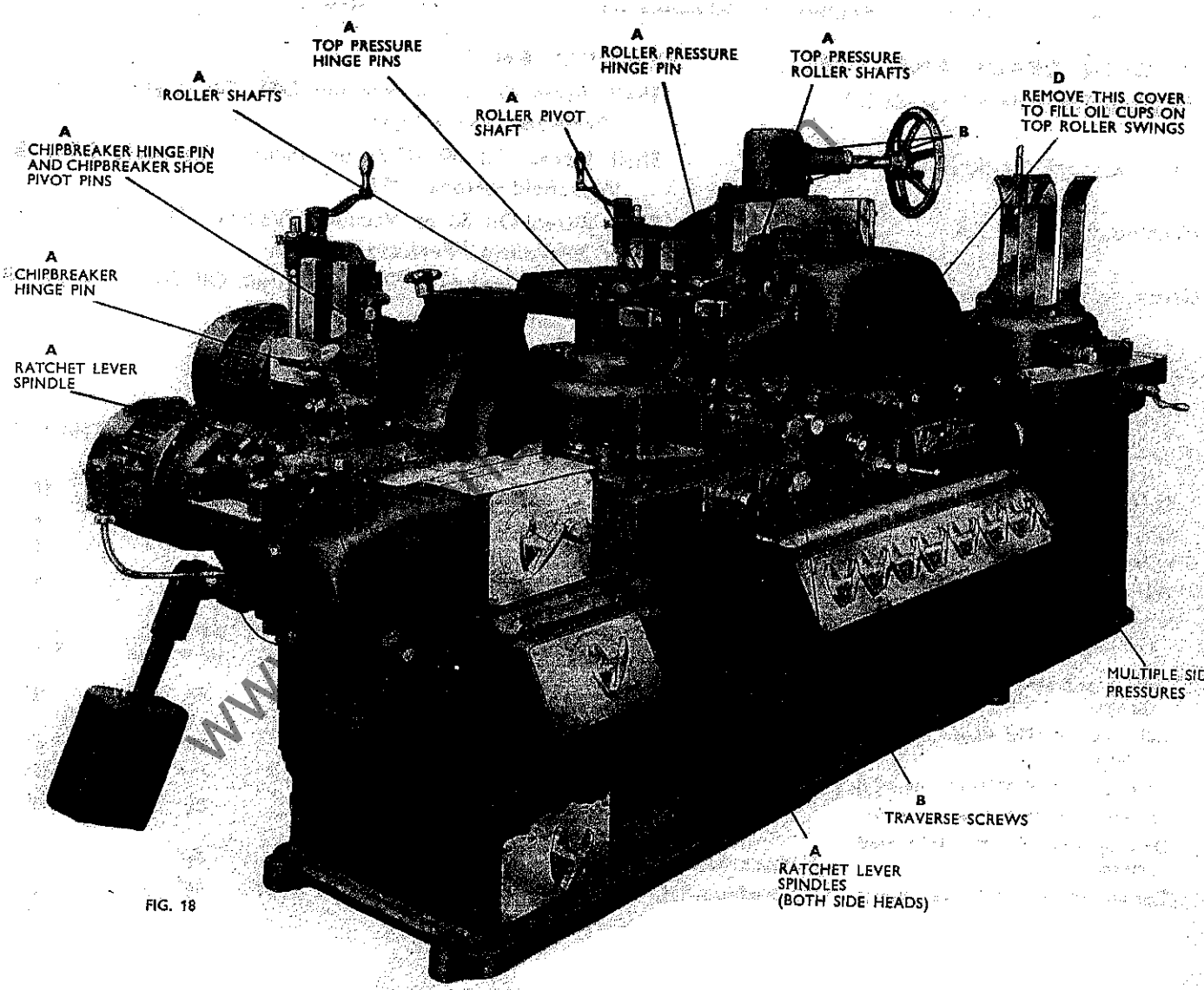


FIG. 18

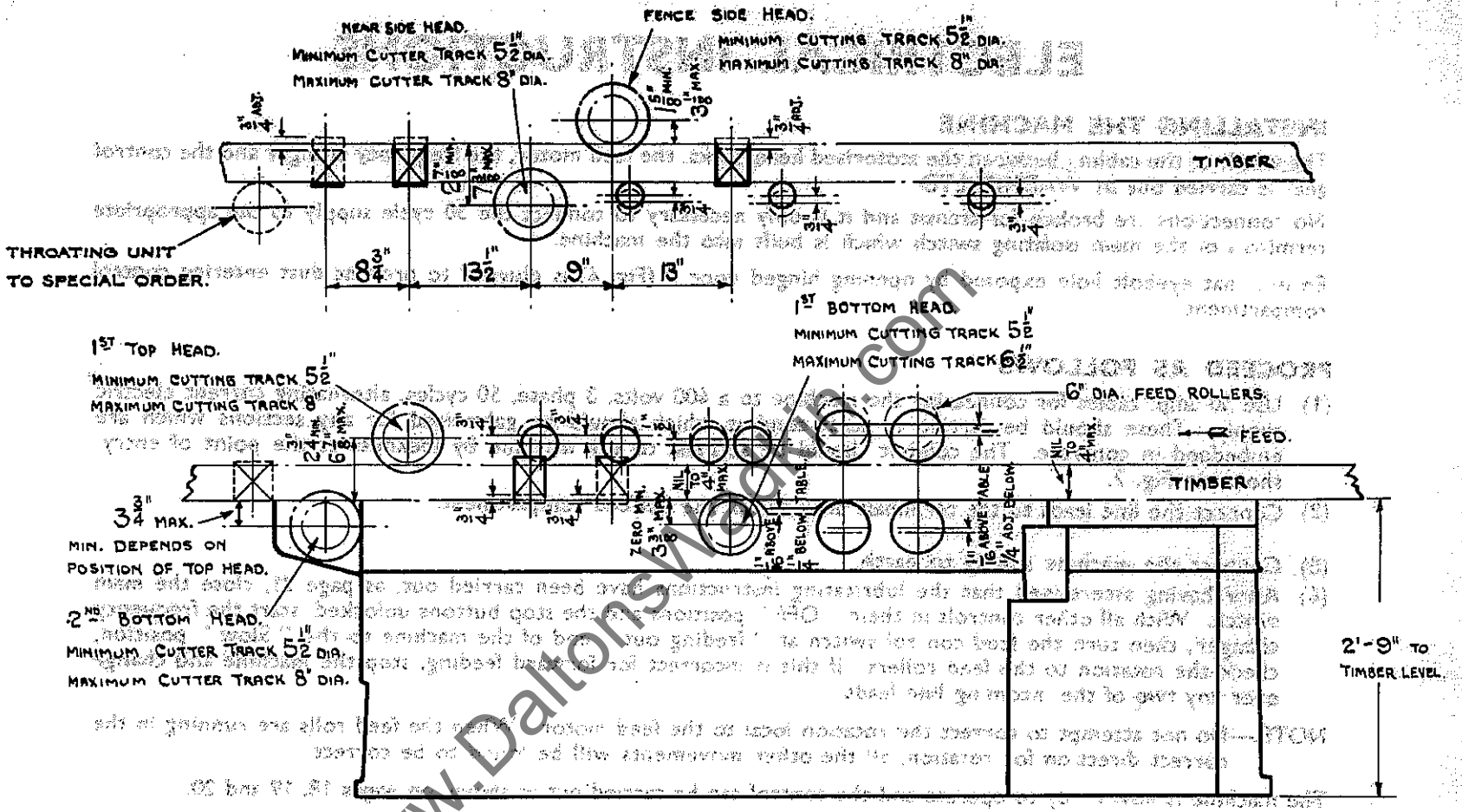
LUBRICATION (continued)

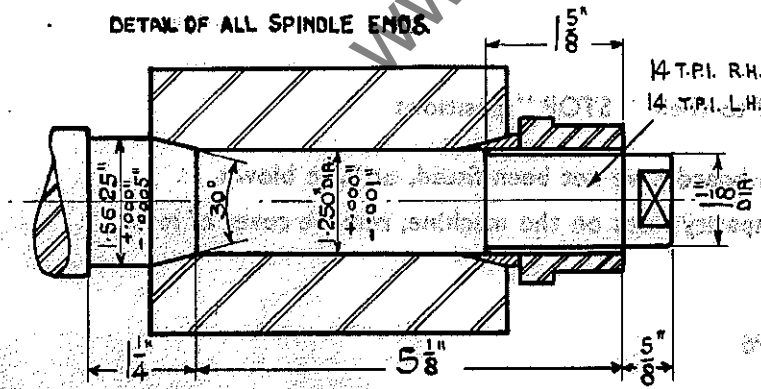
As will be seen from the lubrication instructions Wadkin oils and greases are recommended, but if it is desired to use lubricants other than Wadkin the following equivalents are listed below :

WADKIN GRADE AND TYPE	EQUIVALENTS
High-speed spindle oil, Grade L.1.	Shell Vitrea Oil 27 or Vacuum DTE Oil (Light) or Wakefield "Perfecto" Extra Light.
Heavy gear oil, Grade L.2.	Shell Vitrea Oil 69 (C.2) or Vacuum Gargoyle DTE, BB or Wakefield "Alpha" 017.
Machine oil, Grade L.4.	Shell Vitrea Oil 33 or Vacuum "Vactra" Oil (Medium Heavy) or Wakefield "Perfecto" Heavy.
Grease L.6.	Shell Nevita Grease 3 (VW) or Vacuum Oil Co., Gargoyle BRB 3.

BALL BEARING LIST

POSITION ON MACHINE	MAKERS' No.	QUANTITY	BORE (DIA.)	OUTSIDE DIA.	THICKNESS
Raising screw for top feed rollers..	SKF.010 thrust brg.	1	1¼"	2 3/32"	23/32"
Worm shaft feed works	SKF.RLS.10	1	1½"	2¾"	11/16"
Worm shaft feed works	SKF.RLS.14	1	1¾"	3⅜"	13/16"
Worm shaft feed works	SKF.CRL.14, roller brg.	1	1¾"	3⅜"	13/16"
Per horizontal or vertical cutter spindle	SKF.402599, ball brg.	1	25 mm.	52 mm.	15 mm.
	Hoffman, N.3349, ball brg.	2	45 mm.	85 mm.	19 mm.
Driving end of MZ.4826 frequency changer	Hoffman, MS.13V, ball brg.	1	1½"	3¾ "	15/16"
Tail end of MZ.4826 frequency changer	Hoffman, MS.12½V, ball brg.	1	1⅜"	3½"	⅞"
Driving end of K.4126 driving motor	Hoffman, RMS.12½, roller brg.	1	1⅜"	3½"	⅞"
Tail end of K.4126 driving motor..	Hoffman, MS.12, ball brg.	1	1¼"	3⅛"	⅞"
Driving end of CM.T.3519 feed motor	Hoffman, M.S.11, roller brg.	1	1¼"	3⅛"	⅞"
Tail end of CM.T.3519 feed motor	Hoffman, MS.8, ball brg.	1	1¼"	3⅛"	⅞"





CAPACITY DIAGRAM FOR 4"×4" MOULDER TYPE F.D.

ELECTRICAL INSTRUCTIONS

INSTALLING THE MACHINE

The whole of the cabling between the motorised headstocks, the feed motor, the frequency changer and the control gear is carried out by WADKIN LTD.

No connections are broken for transit and it is only necessary to connect the 50 cycle supply to the appropriate terminals of the main isolating switch which is built into the machine.

Ensure that eyebolt hole exposed by opening hinged door F (Fig. 4) is plugged to prevent dust entering control compartment.

PROCEED AS FOLLOWS

(1) Use 50 amp. cables for connecting the machine to a 400 volts, 3 phase, 50 cycles, alternating current electric supply. These should be carried in steel conduit which should be galvanised for any sections which are embedded in concrete. The conduit should be secured to the machine by locknuts at the point of entry, shown in Fig. 7.

(2) Connect the line leads to the terminals provided in the outfeed compartment.

(3) Connect the machine solidly to earth.

(4) After having ascertained that the lubricating instructions have been carried out, as page 21, close the main switch. With all other controls in their "OFF" positions and the stop buttons unlocked, start the frequency changer, then turn the feed control switch at 'feeding out' end of the machine to the "Slow" position, check the rotation to the feed rollers. If this is incorrect for forward feeding, stop the machine and change over any two of the incoming line leads.

NOTE.—Do not attempt to correct the rotation local to the feed motor. When the feed rolls are running in the correct direction for rotation, all the other movements will be found to be correct.

The machine is now ready to operate and the control can be carried out as shown on pages 18, 19 and 20.

FAILURE TO START

(1) The supply is not available at the machine.
(2) Main switch has not been closed.
(3) The headstock and feed controls have not been moved to their "STOP" positions.
(4) The stop buttons have been left locked off.
(5) The fuses either at the machine or at your distribution board have not been fitted, or have blown.

NOTE.—To obtain access to the 50 amp. high rupturing capacity fuses on the machine, remove cover of main switch (Fig. 12).

FAILURE TO START (continued)

(6) Imperfect connection causing faulty contact.

If items 1 to 5 are in order, the main contactor (Page 30 and 31) should close when the frequency changer starter is moved to the "START" position. If it fails to do this, the contactor operating coil circuit should be carefully checked through (as Page 30 and 31) until the break in the circuit is located. The overload relay and retaining contact should be especially examined. If the contactor should close when the star delta starter is moved to the "START" position but falls open when it is moved to the "RUN" position, then the portion of the circuit between the retaining contact to the master stop button should be examined.

FAILURE OF HEAD MOTORS TO GAIN FULL SPEED

(1) Interchange any two leads, A3, B3 and C3 at frequency changer terminal block (Page 30 and 31).

(2) Ensure that frequency changer drive is not slipping due to slack vee ropes.

FEED MOTOR SPEED ERRATIC

If it has been disconnected for any reason, check carefully that the correct connections have been remade.

If it has not been disconnected, check that the speed selector switch is operating correctly and that the connections are being made for each position of the feed selector switch, as shown in the table on Page 32. Check for an earth on the machine wiring.

Ensure that the brushgear is secure and correctly set. Incorrect setting will cause loss of torque, high secondary currents (D, DD, E, EE), and very low feed speeds.

ACCESS TO CONTROL GEAR

Access to the main controllers is obtained by removing the hexagon bolts along the top of each cover opposite to the hinge, and swinging the cover open. In the main compartment is also housed the main contactor, control circuit fuses,

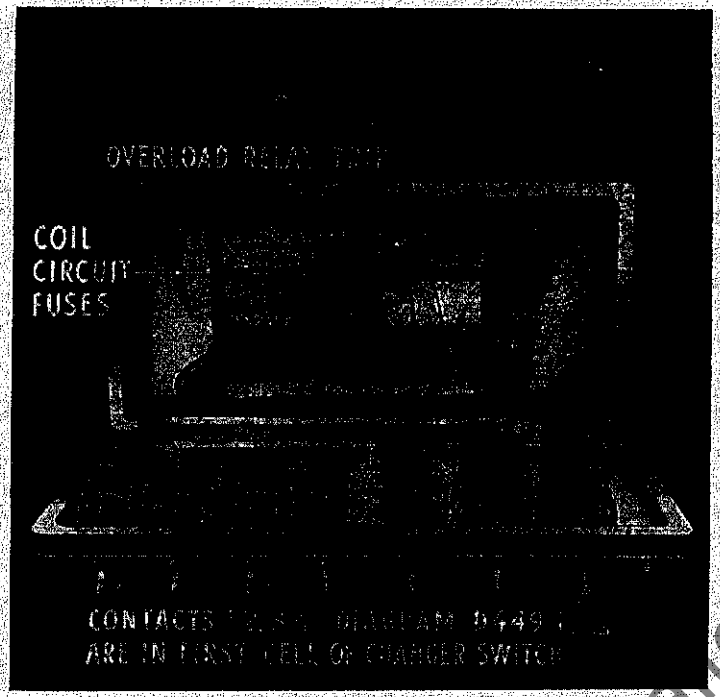


Fig. 21

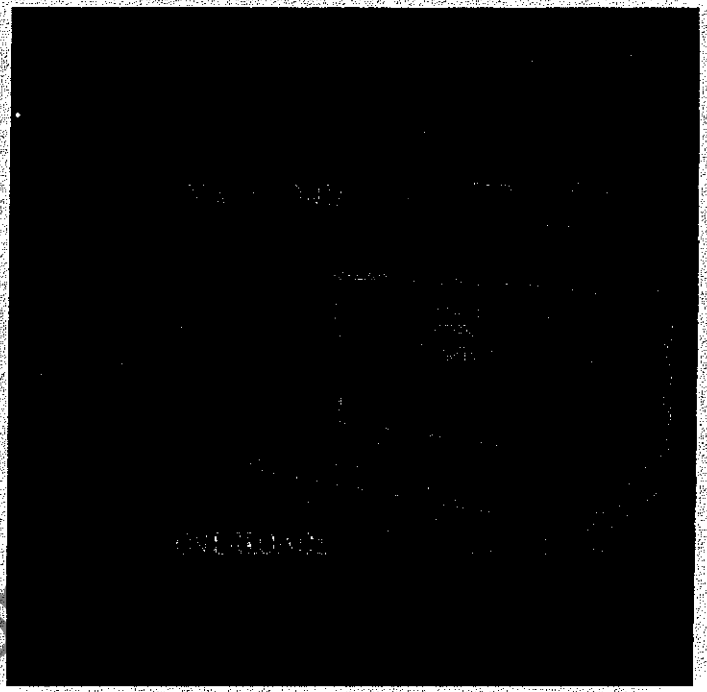


Fig. 22

ACCESS TO CONTROL GEAR (continued)

Overloads and Metal Rectifier used for D.C. injection braking.

The main switch is housed in the cavity on the "feeding out" end of the machine, but access is best obtained obtained by removing the plate containing the switch.

Access to the controller contacts is obtained by removing the spring clip on the base of each controller and withdrawing the various switch sections to expose the contacts.

Great care must, of course, be taken to replace the contacts and shims in the correct position. (Developed diagram of the switches appear on pages 32 and 33.)

GENERAL ELECTRICAL MAINTENANCE

There is no particular maintenance required in connection with the electrical gear on the machine and unless it is failing to operate satisfactorily it is best to leave the covers tightly closed and not interfere with the control gear. If contacts are actually failing to make contact due to wear and tear, they can be changed but they should not be changed because they look burnt, and they should never be filed.

The machine should be occasionally blown down with the Wadkin electric blower and we recommend displaying in the Maintenance Department our Electrical Maintenance Instruction Card No. 356, which will be supplied gratis on request.

If control compartment doors or covers are opened, ensure that when closing, all screws are replaced and tightened to prevent dust from entering.

ELECTRICAL SPARES

BALL AND ROLLER BEARINGS (see page 24)

BRUSHES

Frequency changer MZ.4826	Part No. SK.78/396
Feed motor CMT.3519 (8 off)	Part No. SK.26/161

CONTACTS AND SPRINGS FOR ROTARY SWITCHES (EXCEPT CHANGER SWITCH).

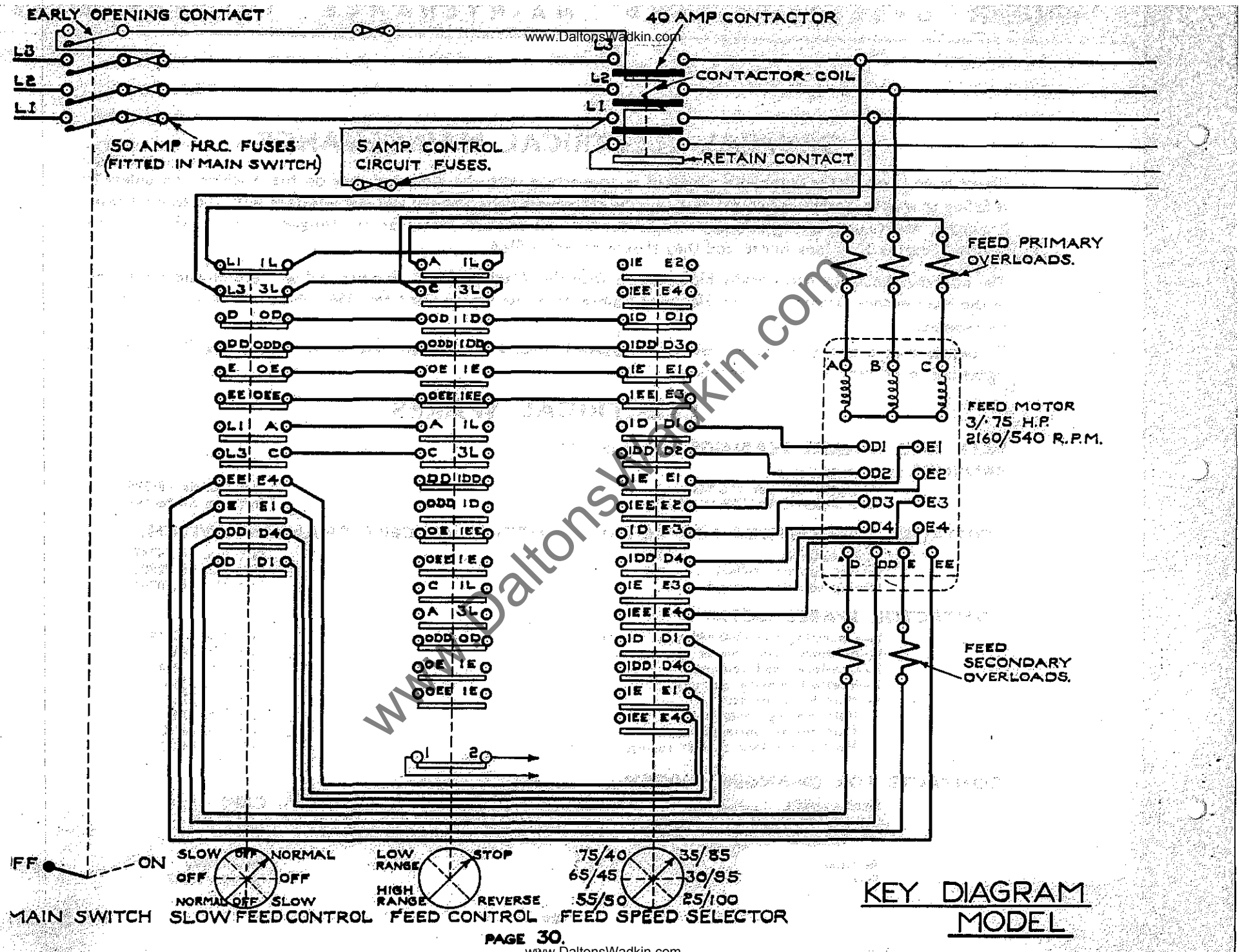
Fixed contacts	Part No. SK.24747
Moving contact (roller)	Part No. SK.22205
Moving contact (springs)	Part No. SK.20764

CONTACTOR SPARES (SC2N)

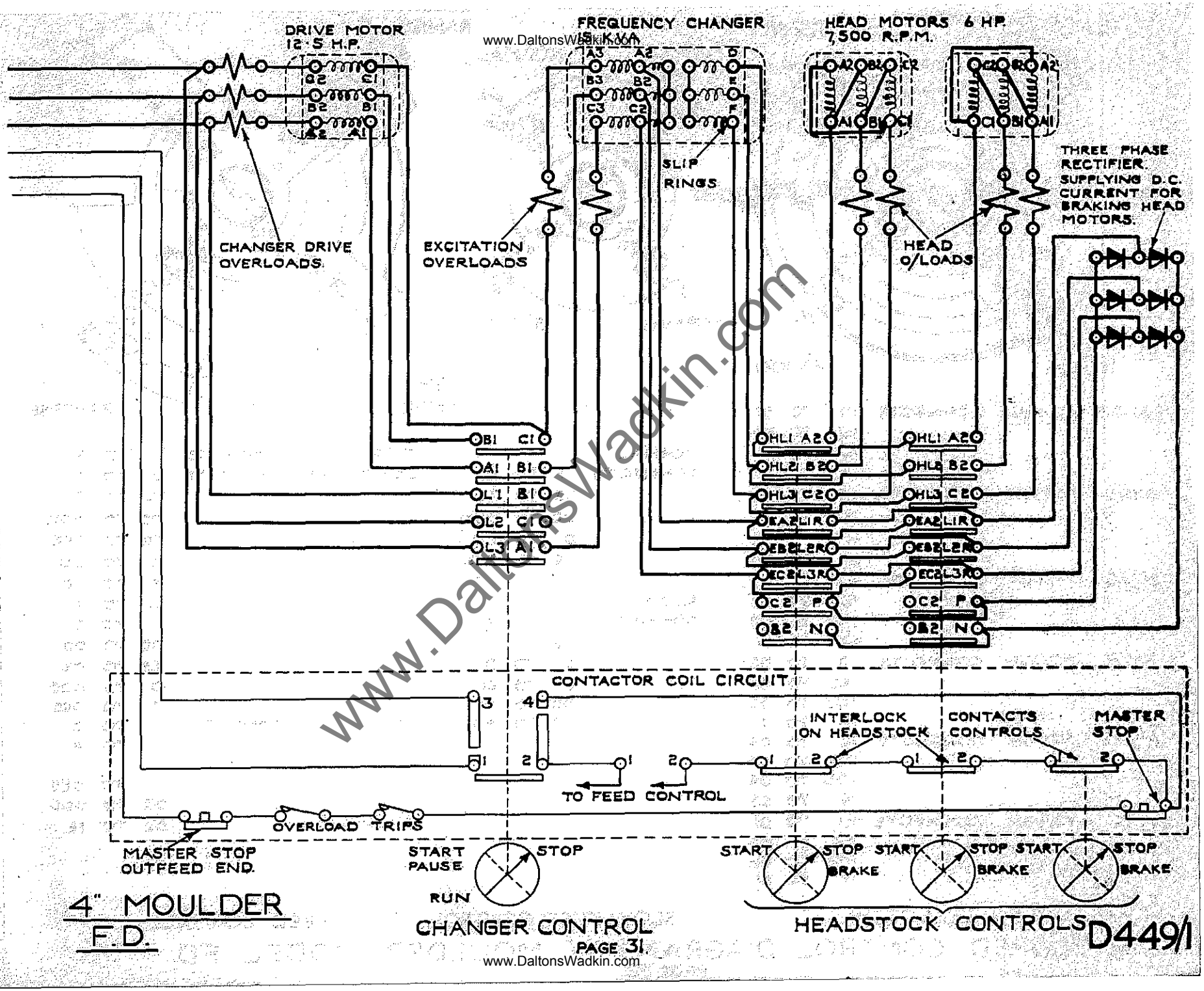
1—Operating coil (340-440 volts, 50 cycles)	Part No. A.5118
1—Interlock fixed contact	Part No. 583J
3—Interlock fixed contacts	Part No. Z.263
2—Interlock moving contacts	Part No. 535V
6—Main fixed contacts	Part No. 575J
3—Main moving contacts	Part No. 574J
3—Main contact springs	Part No. 361K
2—Moving interlock contact springs	Part No. 042Q

CONTACTS FOR CHANGER SWITCH.

Fixed contacts	C.3340
Moving contacts	3335
Moving contact spring	2979
Rectifier	PB-84-3-1W
Fuses	List No. 15947



KEY DIAGRAM MODEL

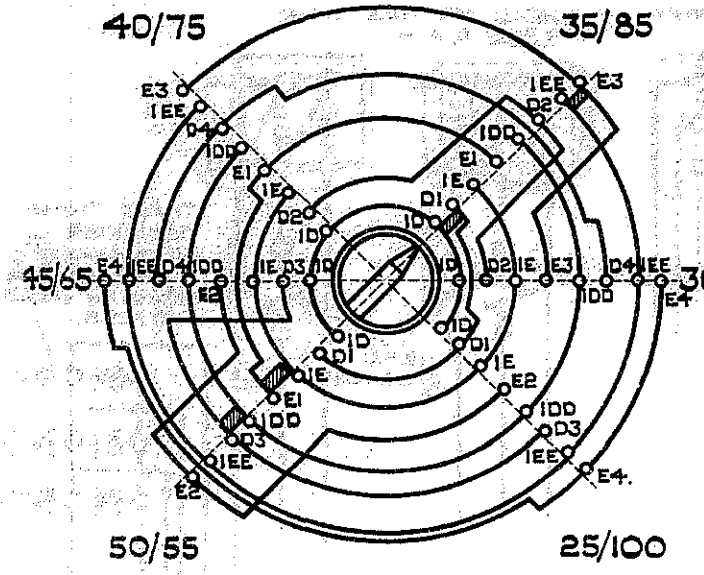


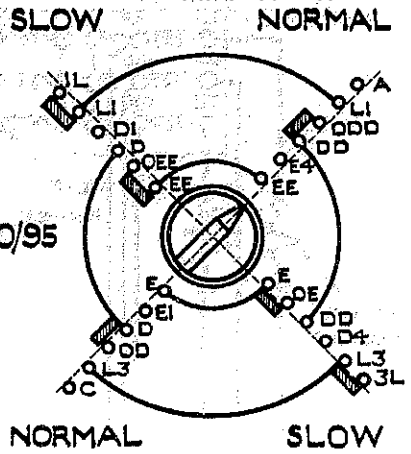
4" MOULDER F.D.

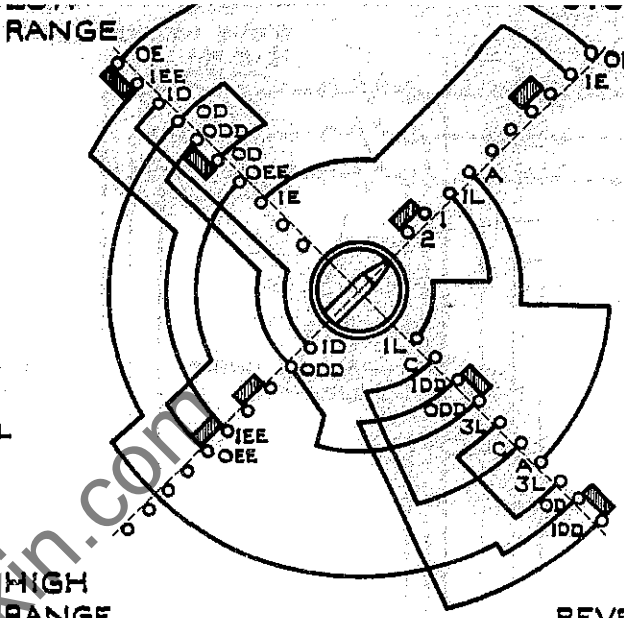
CHANGER CONTROL

HEADSTOCK CONTROLS

D449/1







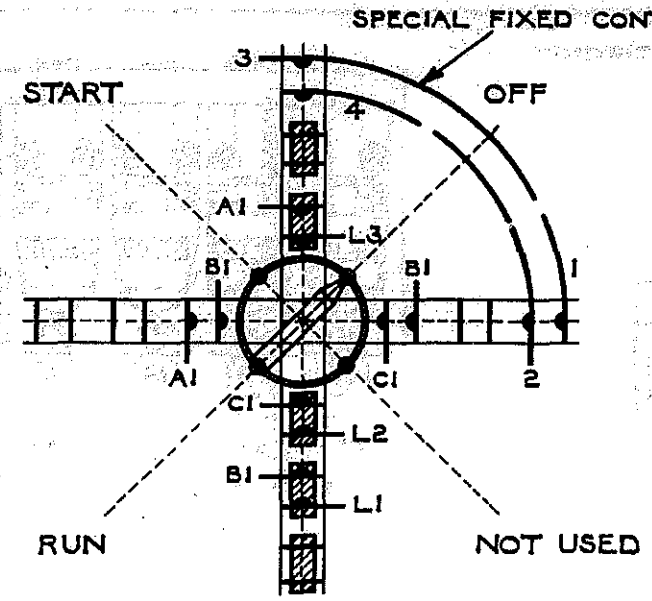
25/100	FT/MIN	CONNECTS	ID	TO	DI
			IEE	TO	E4
			IDD	TO	D4
			IE	TO	EI
30/95	FT/MIN	CONNECTS	ID	TO	D2
			IEE	TO	E4
			IDD	TO	D4
			IE	TO	E2
35/85	FT/MIN	CONNECTS	ID	TO	DI
			IEE	TO	E3
			IDD	TO	D3
			IE	TO	EI
40/75	FT/MIN	CONNECTS	ID	TO	D2
			IEE	TO	E3
			IDD	TO	D3
			IE	TO	E2
45/65	FT/MIN	CONNECTS	ID	TO	D3
			IEE	TO	E4
			IDD	TO	D4
			IE	TO	E3
50/55	FT/MIN	CONNECTS	ID	TO	DI
			IEE	TO	E2
			IDD	TO	D2
			IE	TO	EI

'NORMAL'			
CONNECTS	LI	TO	IL
	L3	TO	3L
	DD	TO	ODD
	D	TO	OD
	EE	TO	OEE
	E	TO	OE
'SLOW'			
CONNECTS	LI	TO	A
	L3	TO	C
	D	TO	DI
	E	TO	EI
	DD	TO	D4
	EE	TO	E4

'STOP'	CONNECTS	1	TO 2
'LOW RANGE'	CONNECTS	IL	TO A
		3L	TO C
		IDD	TO ODD
		IEE	TO OEE
		ID	TO OD
		IE	TO OE
'HIGH RANGE'	CONNECTS	IL	TO A
		3L	TO C
		IDD	TO OD
		IEE	TO OE
		ID	TO ODD
		IE	TO OEE
'REVERSE'	CONNECTS	IL	TO C
		3L	TO A
		IE	TO OEE
		OD	TO ODD
		OE	TO IE

FEED SPEED SELECTOR. SLOW FEED CONTROL. FEED CONTROL.

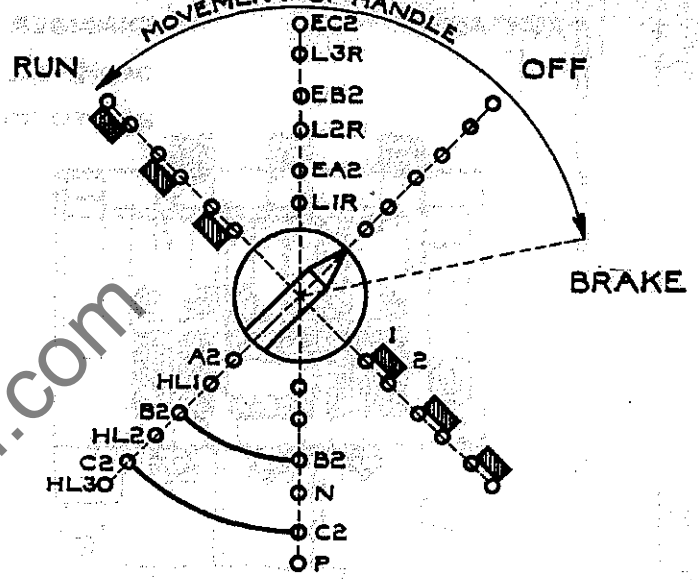
DEVELOPED CONTROL DIAGRAMS 4" MOULDER MODEL FD.



FIXED CONTACT —●—
MOVING CONTACT ▨

OFF	CONNECTS	L1	TO	B1
		L2	TO	C1
		L3	TO	A1
START	CONNECTS	1	TO	2
		B1	TO	C1
		B1	TO	A1
RUN	CONNECTS	3	TO	4
		L1	TO	B1
		L2	TO	C1
		L3	TO	A1

FREQUENCY CHANGER CONTROL.



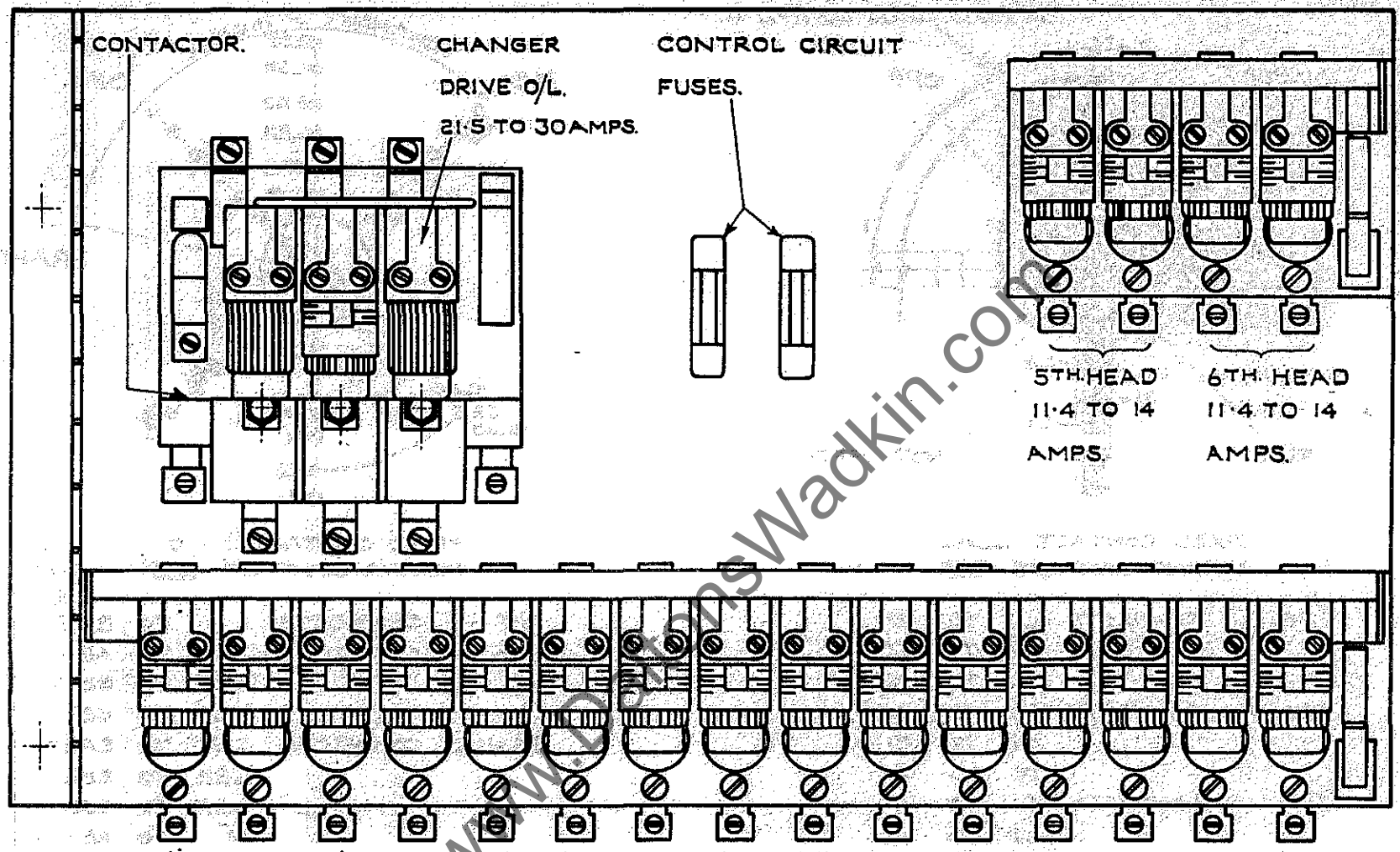
FIXED CONTACT ○
MOVING CONTACT ▨

OFF	CONNECTS	1	TO	2
RUN	CONNECTS	HL1	TO	A2
		HL2	TO	B2
		HL3	TO	C2
BRAKE	CONNECTS	L1R	TO	EA2
		L2R	TO	EB2
		L3R	TO	EC2
		N	TO	B2
		P	TO	C2

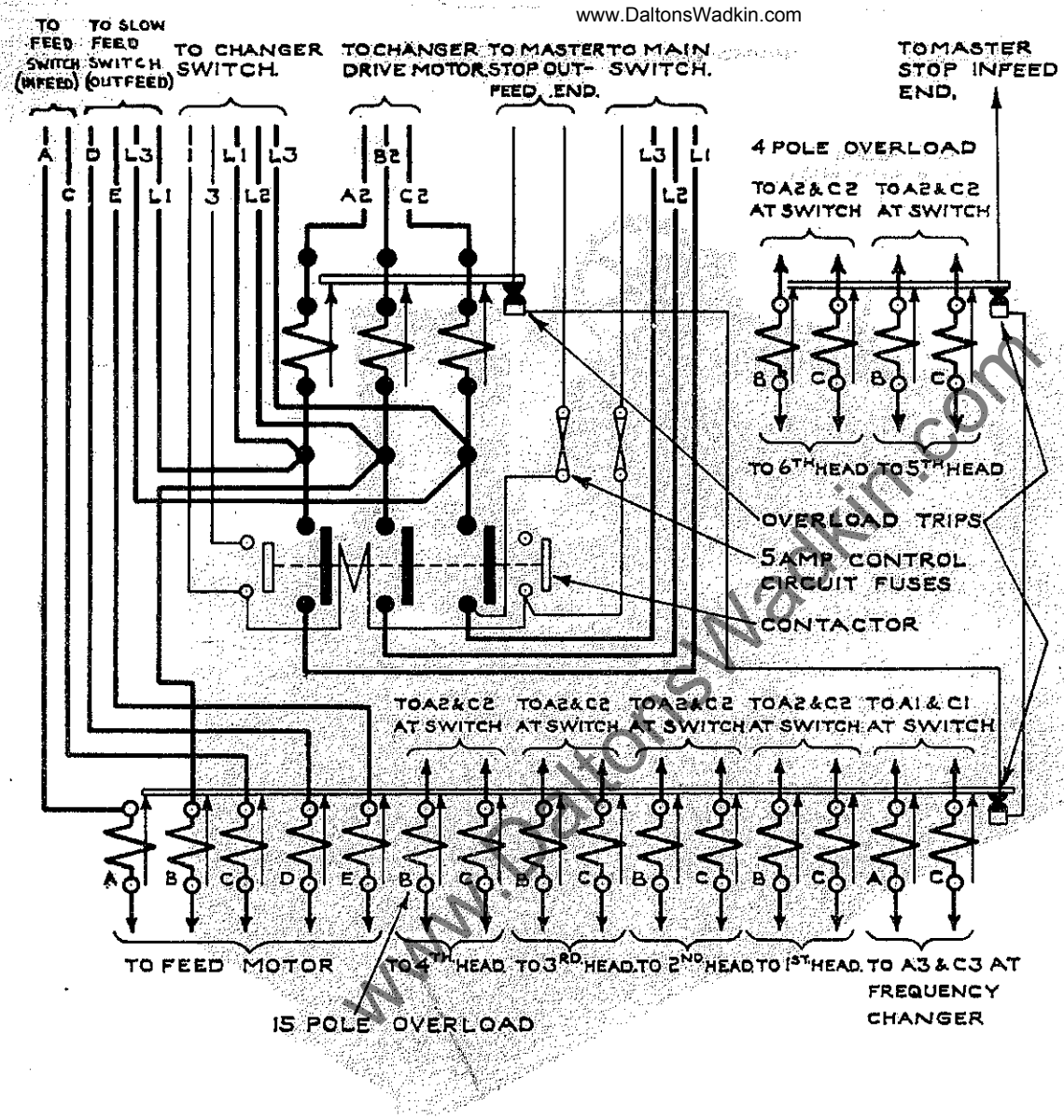
HEAD MOTOR CONTROL.

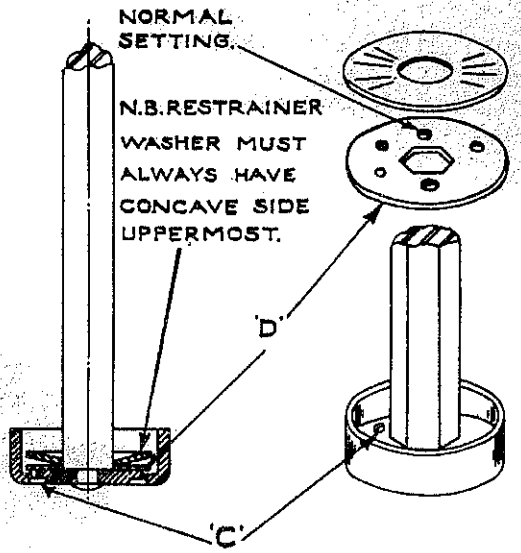
DEVELOPED CONTROL DIAGRAMS 4" MOULDER MODEL F.D.

USE IN CONJUNCTION WITH SCHEMATIC DIAGRAM. PAGES 30 AND 31.



LAYOUT OF CONTACTOR PANEL 4"FD.



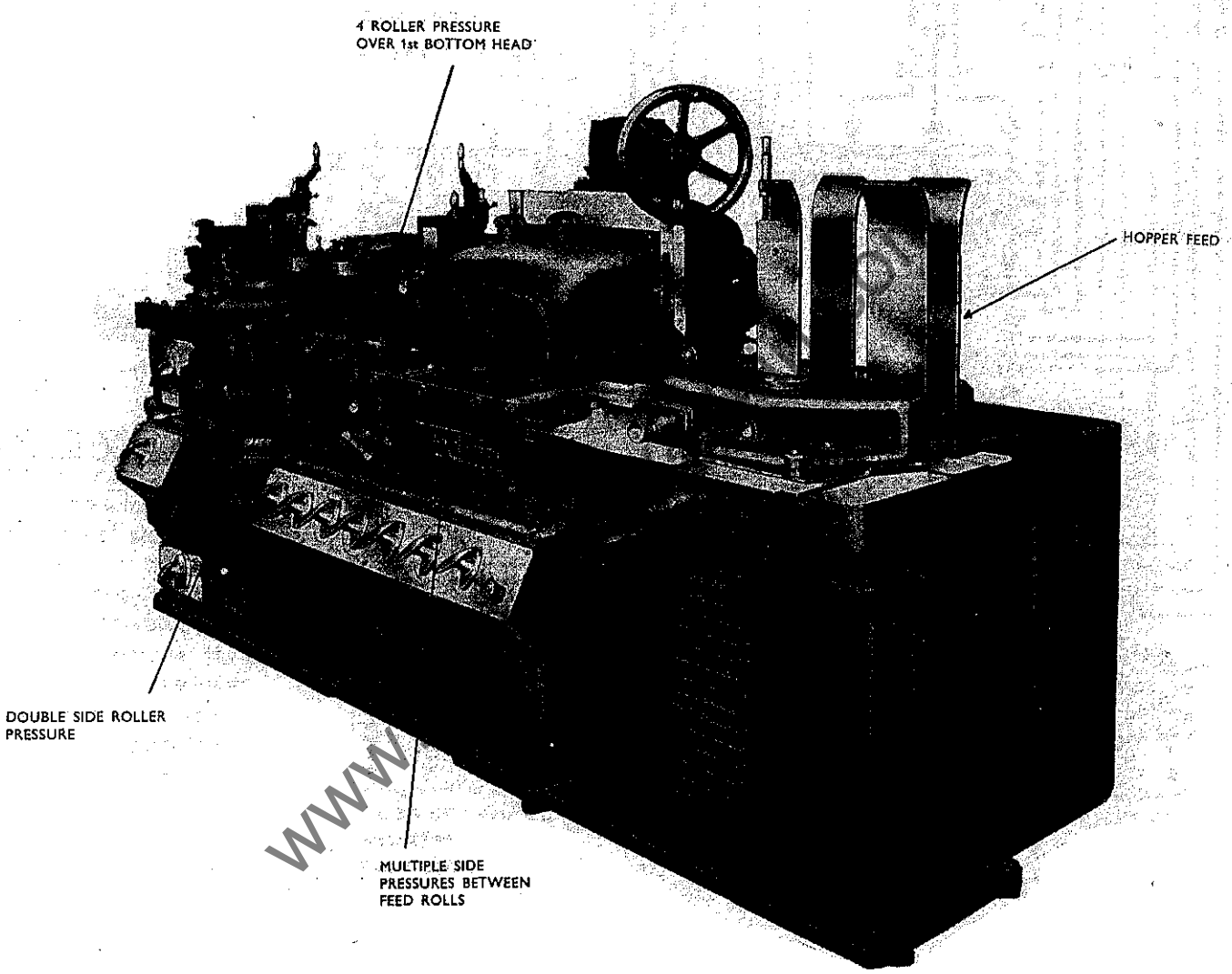


OVERLOAD RELAY.

SEE THAT THE OVERLOAD TIME LAG DASHPOTS ARE QUITE CLEAN & THEN FILL TO WITHIN 1/2 OF TOP WITH SPECIAL OIL SUPPLIED WITH STARTER. TO OBTAIN CORRECT OVERLOAD PROTECTION. ADJUST THE DASHPOTS SO THAT THEIR TOP EDGES ARE IN LINE WITH THE CALIBRATION MARKS NEAREST TO 1 1/4 TIMES THE FULL LOAD CURRENT OF THE MOTOR. THE VALUES INDICATED ON THE CALIBRATION PLATE REPRESENTS THE MINIMUM CURRENTS AT WHICH THE RELAYS WILL TRIP AT ANY ONE OF THE SETTINGS SHOWN. THE STARTERS ARE DESPATCHED WITH TIME LAGS SET AT THE CENTRE POSITION (SEE SKETCH 'D'), BUT IF THE NATURE OF THE LOAD NECESSITATES A LONGER TIME LAG THE SETTING IS ADJUSTABLE BY ALTERING THE POSITION OF WASHER 'D' RELATIVE TO FIXED HOLE 'C' THE FIVE HOLES IN WASHER 'D' ARE OF VARYING SIZES SO THAT FIVE SETTINGS ARE AVAILABLE.

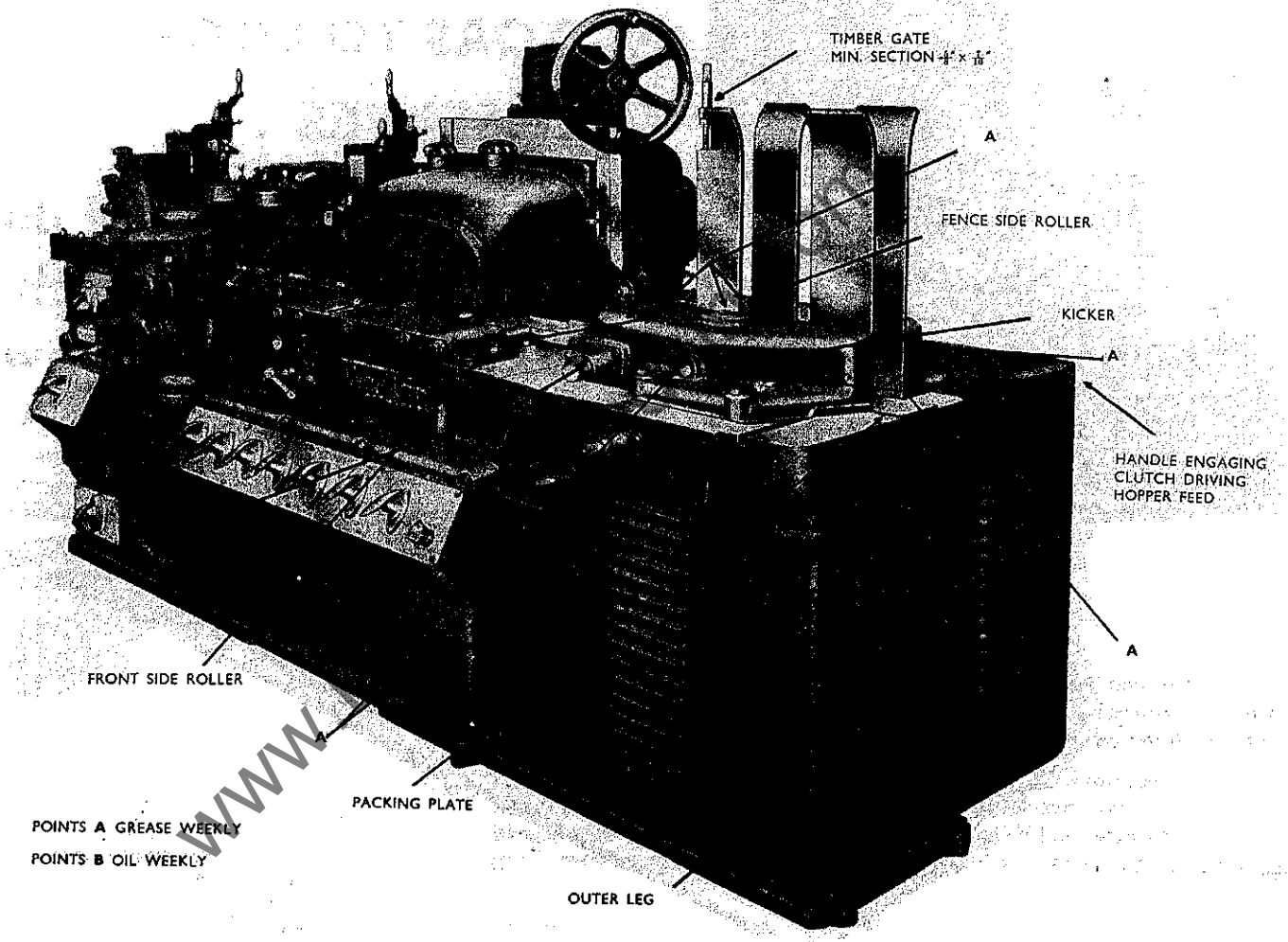
DIAGRAM OF CONNECTIONS AT CONTACTOR PANEL.

HOPPER FEED.



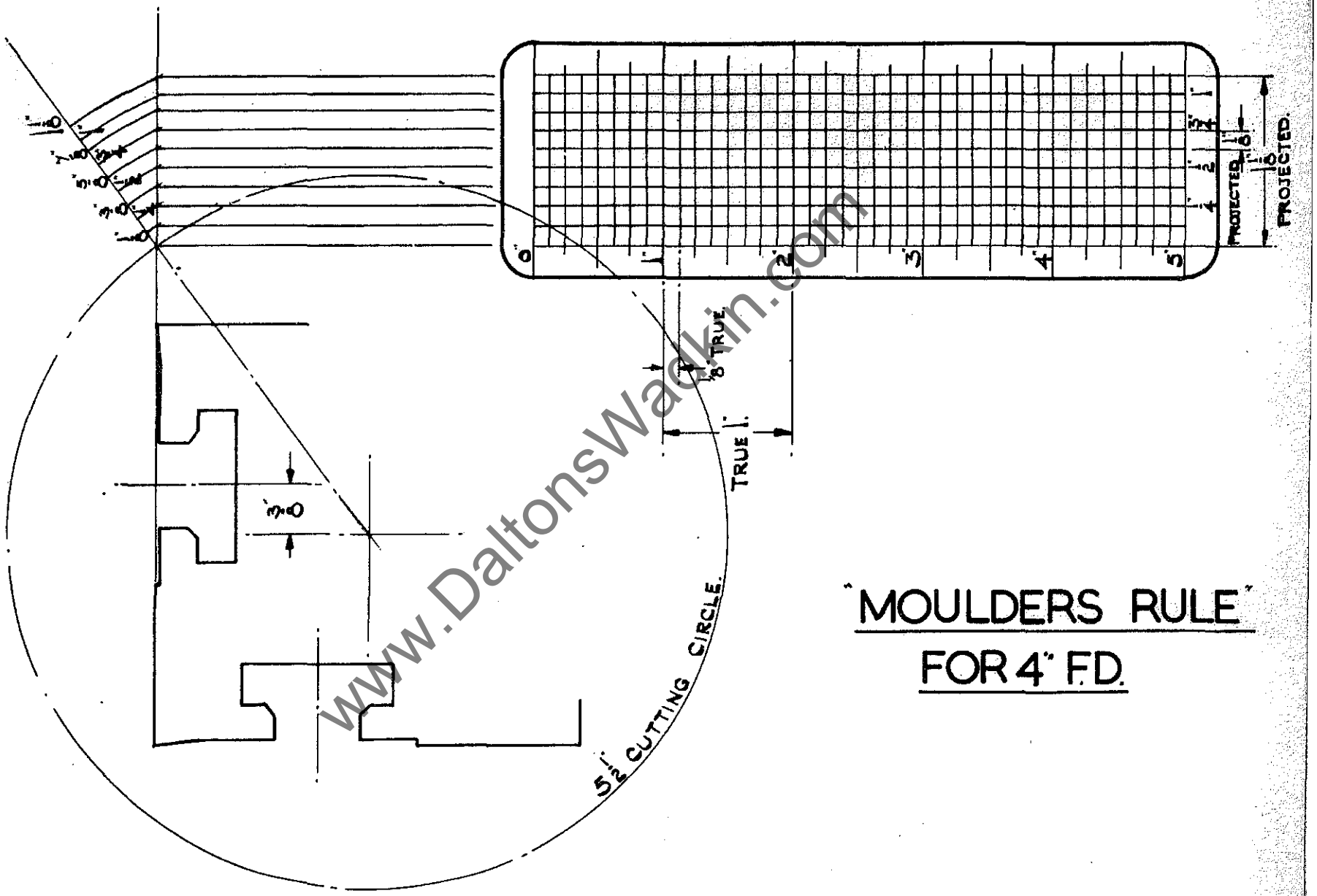
THE ABOVE PRESSURES CAN BE SUPPLIED FOR SMALL SECTION STOCK TO SPECIAL ORDER

HOPPER FEED

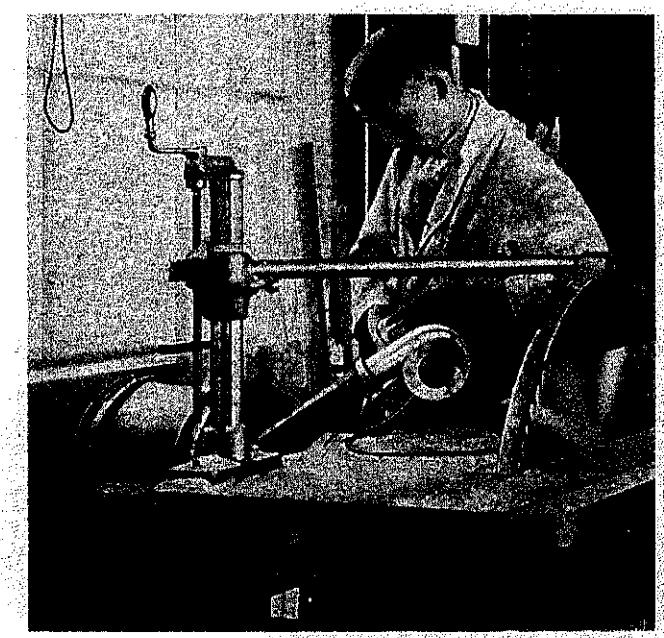


FITTING HOPPER FEED

(1) Remove " infeed " table and fence.
(2) Move outer leg supporting " infeed " table out 4".
(3) Remove cap from worm box and fit driving sprocket on worm wheel shaft extension.
(4) Fit hopper feed table lining up hopper with the adjustable fence, using a new locating plate supplied with the hopper.
(5) Fit new guards to front and rear of " infeed " table.

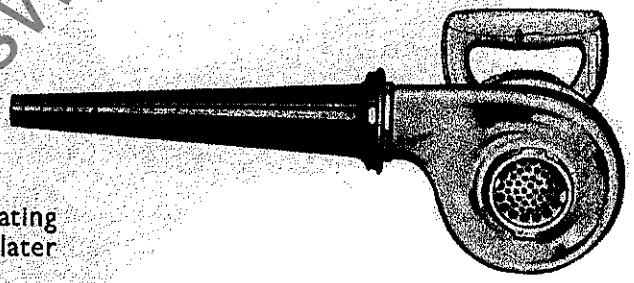


"MOULDERS RULE"
FOR 4" F.D.



DONT LEAVE ELECTRIC MOTORS TO LOOK AFTER THEMSELVES . . .

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



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

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

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

Please state voltage when ordering.

SPECIFICATION

Horse-power of motor	$\frac{1}{3}$rd
Net weight...	7 lbs.
Speed	11,400 r.p.m.
Velocity of air in feet per minute ...	14,800
Fully guaranteed for one year	

Feedworks - General Details (See Drawing FD 1667)

Item A	Pivot Shaft for Swings	FD 1609
	Combined Sprocket and Gear	FD 1665
	Bush for Sprocket and Gear	FD 1608
Item B	Top feedroll Shaft	FD 153
	Bush for Feedrolls Shaft	FD 166
	Gear for Feedroll Shaft	FD 161/A
(Not Shown)	Bottom Feedroll Shaft	FD 154
	Bush for Feedrolls Shaft	FD 168
	Gear for Feedrolls Shaft	FD 162
	Drive Gear for Bottom Rolls	FD 163
Item C	Idler Sprocket	FD 1656
	Shaft for Sprocket	FD 1642
	Bush for Sprocket	FD 1645
Item D	Tightener Sprocket	FD 171
	Shaft for Sprocket	FD 172
	Bush for Sprocket	FD 175
Item E	Drive Chain	K30 09 360
(Not Shown)	Main Drive Sprocket	FD 1657

4" FD BEDPLATES

MODEL FD 1

A	Bedplates before 1st Bottom Head	FD 2470
B	Bedplates after 1st Bottom Head	FD 2471
C	Bedplates for Fever Side Head	FD 2472
D	Bedplate for Front Side Head	FD 2473
E	Bedplate before Top Head	FD 2474
F	Bedplate under Top Head (Permali)	FD 1523
G	Bedplate after Top Head	FD 2478
H	Bedplate after Top Head	FD 2479

MODEL FD 2

A	Bedplate before 1st Bottom Head	FD 2470
B	Bedplate after 1st Bottom Head	FD 2471
C	Bedplate for Fever Side Head	FD 2472
D	Bedplate for Front Side Head	FD 2473
E	Bedplate before Top Head	FD 2478
F	Bedplate under Top Head (Permali)	FD 1522
G	Bedplate after Top Head	FD 2479
H	Bedplate for outfeed table	FC 67A

MODEL FD 3

A	Bedplate before 1st Bottom Head	FD 2470
B	Bedplate after 1st Bottom Head	FD 2471
C	Bedplate for Fever Side Head	FD 2472
D	Bedplate for Front Side Head	FD 2473
E	Bedplate for 1st Top Head	FD 2476
F	Bedplate before 2nd Top Head	FD 2475
G	Bedplate under 2nd Top Head (Permali)	FD 1523
H	Bedplate after 2nd Top Head	FD 2475

4" FD BEDPLATES

MODEL FD 4

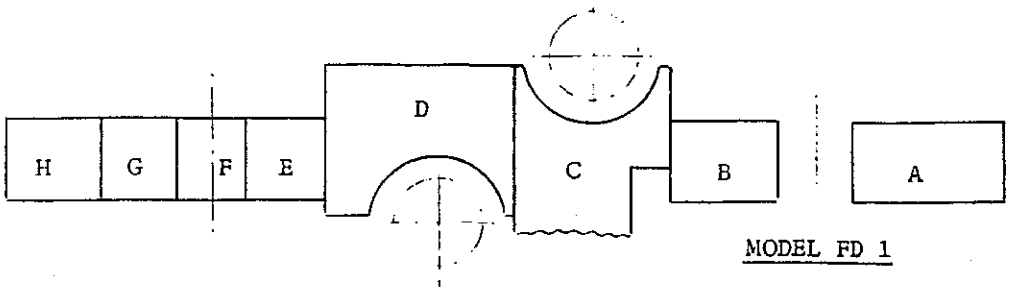
A	Bedplate before 1st Bottom Head	FD 2470
B	Bedplate after 1st Bottom Head	FD 2471
C	Bedplate for Fever Side Head	FD 2472
D	Bedplate for Front Side Head	FD 2473
E	Bedplate before 1st Top Head	FD 2474
F	Bedplate under 1st Top Head (Permali)	FD 1523
G	Bedplate after 1st Top Head	FD 2474
H	Bedplate before 2nd Top Head	FD 2478
I	Bedplate under 2nd Top Head (Permali)	FD 1522
J	Bedplate after 2nd Top Head	FD 2479
K	Bedp ate for outfeed Table	FC 67A

MODEL FD 5

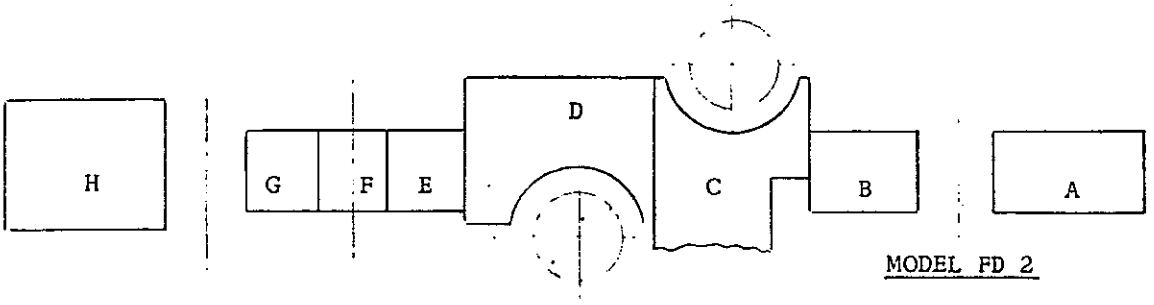
A	Bedplate before 1st Bottom Head	FD 2470
B	Bedplate after 1st Bottom Head	FD 2471
C	Bedplate under 1st Top Head	FD 2476
D	Bedplate for Fever Side Head	FD 2472
E	Bedplate for Front Side Head	FD 2472
F	Bedplate before 2nd Top Head	FD 2478
G	Bedplate under 2nd Top Head (Permali)	FD 1522
H	Bedplate after 2nd Top Head	FD 2479
I	Bedplate after 2nd Top Head	FD 2473

MODEL FD 6

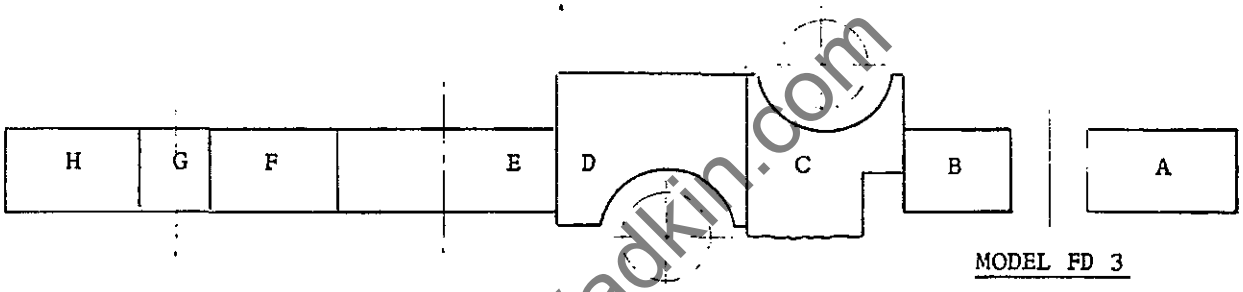
A	Bedplate before 1st Bottom Head	FD 2470
B	Bedplate after 1st Bottom Head	FD 2471
C	Bedplate under 1st Top Head	FD 2476
D	Bedplate for Fever Side Head	FD 2472
E	Bedplate for Front Side Head	FD 2473
F	Bedplate before 2nd Top Head	FD 2478
G	Bedplate under 2nd Top Head (Permali)	FD 2479
H	Bedplate after 2nd Top Head	FD 2479
I	Bedplate for outfeed table	FC 67A



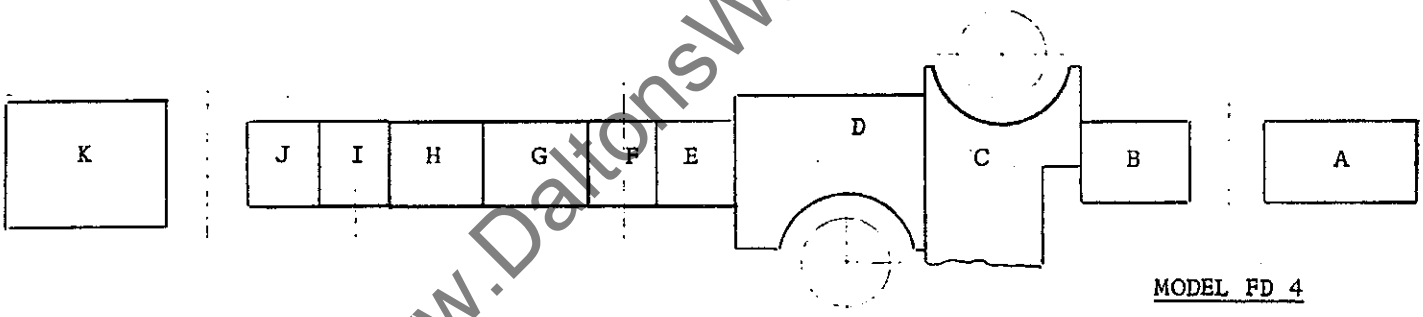
MODEL FD 1



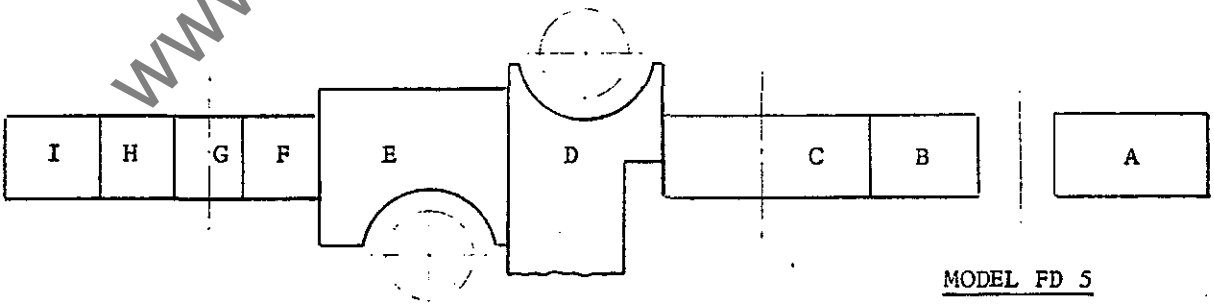
MODEL FD 2



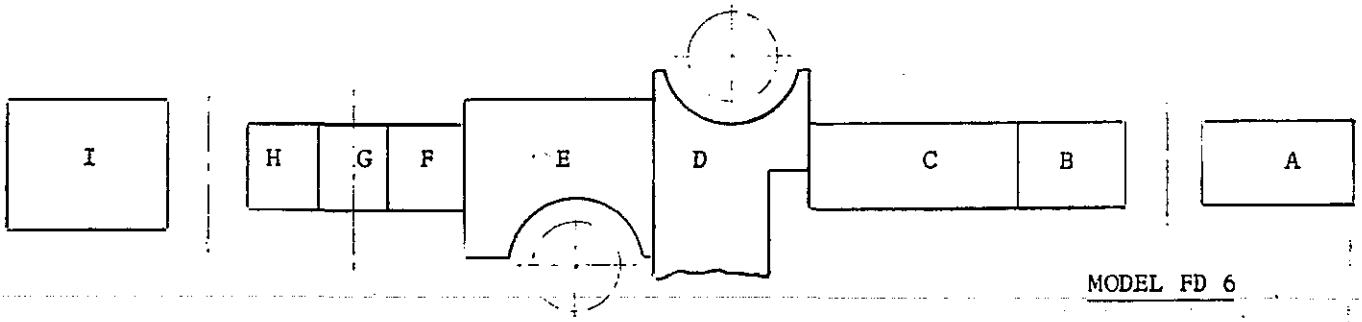
MODEL FD 3



MODEL FD 4

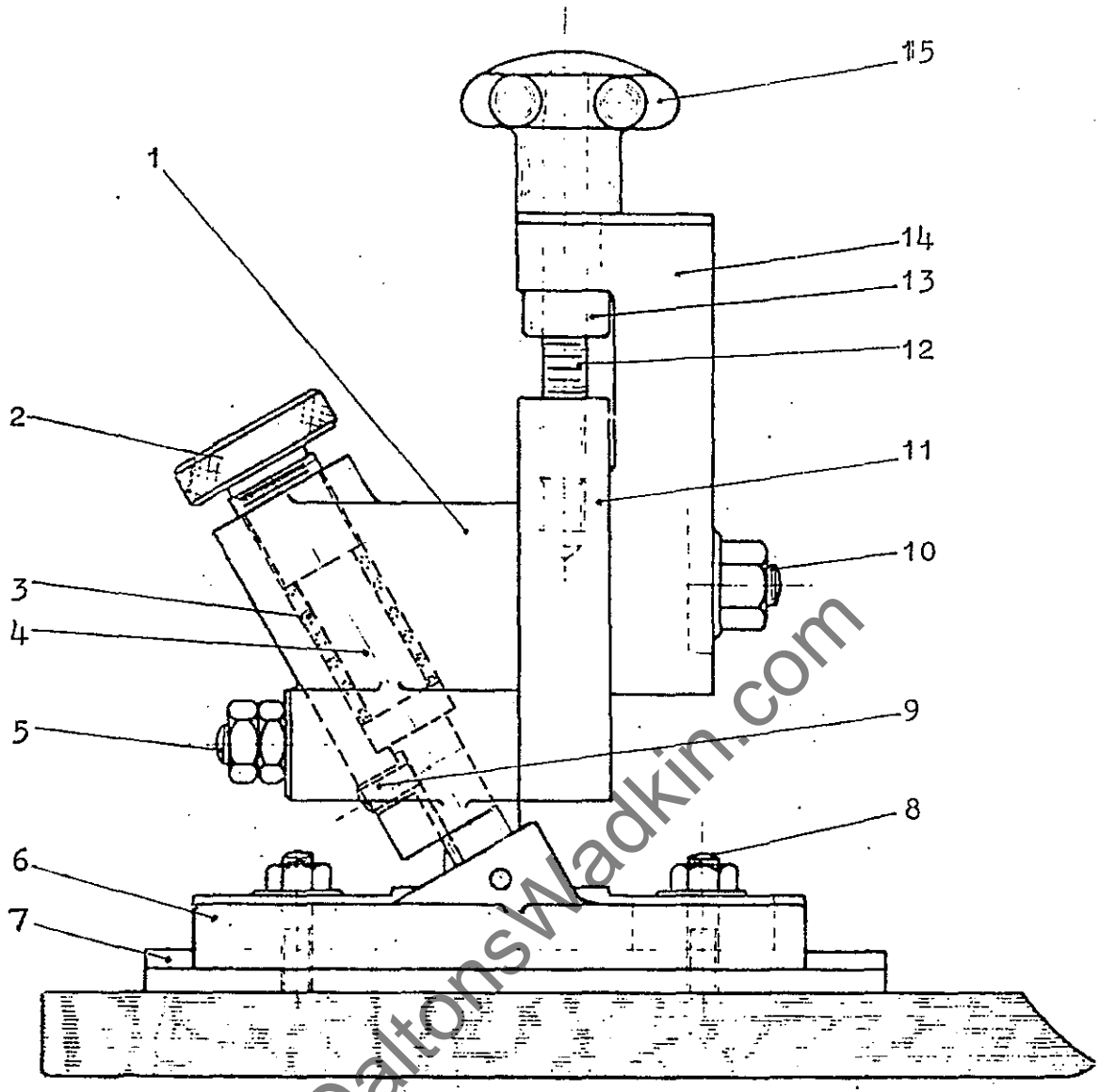


MODEL FD 5



MODEL FD 6

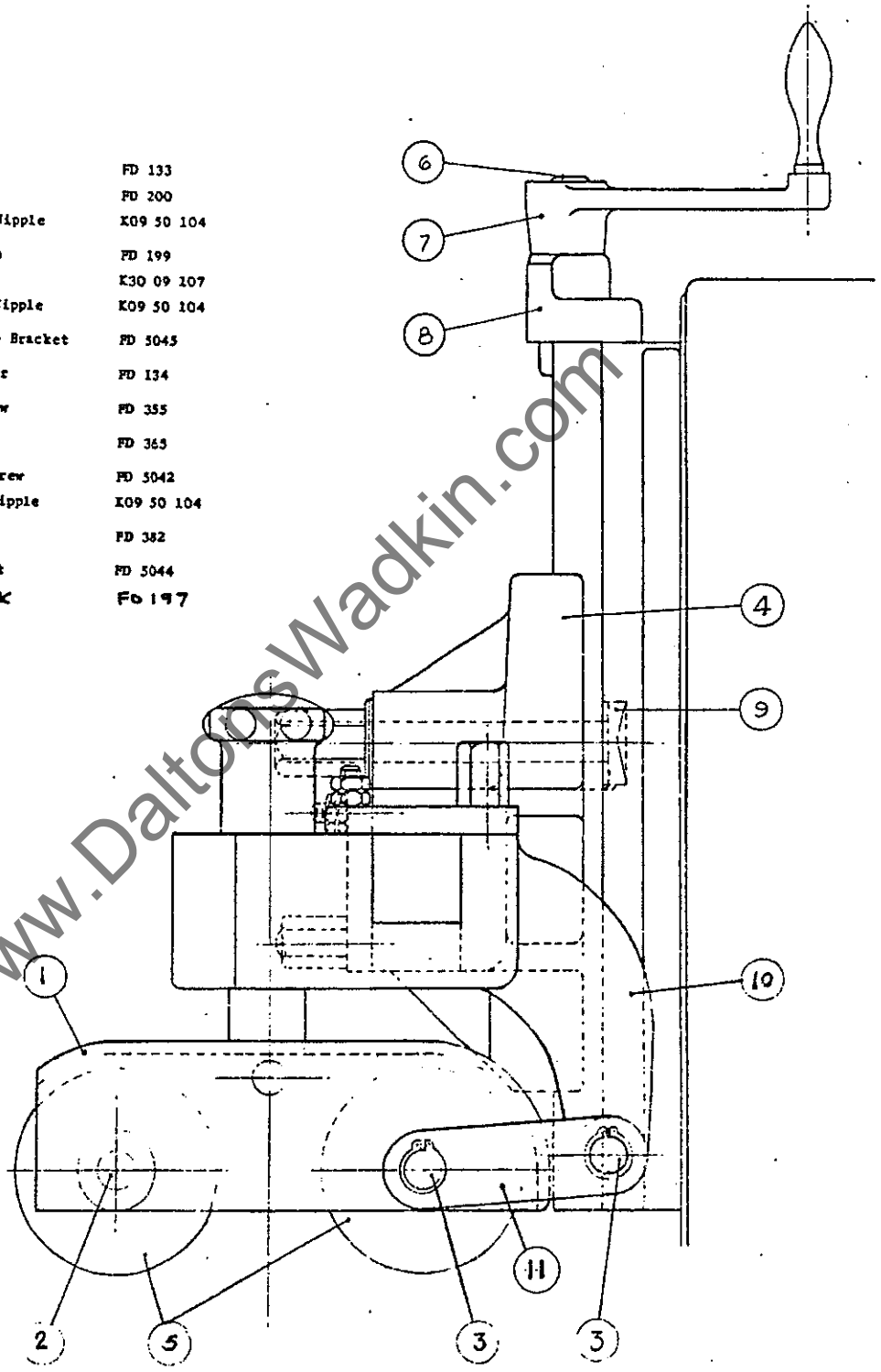
4" FD BEDPLATE CHART



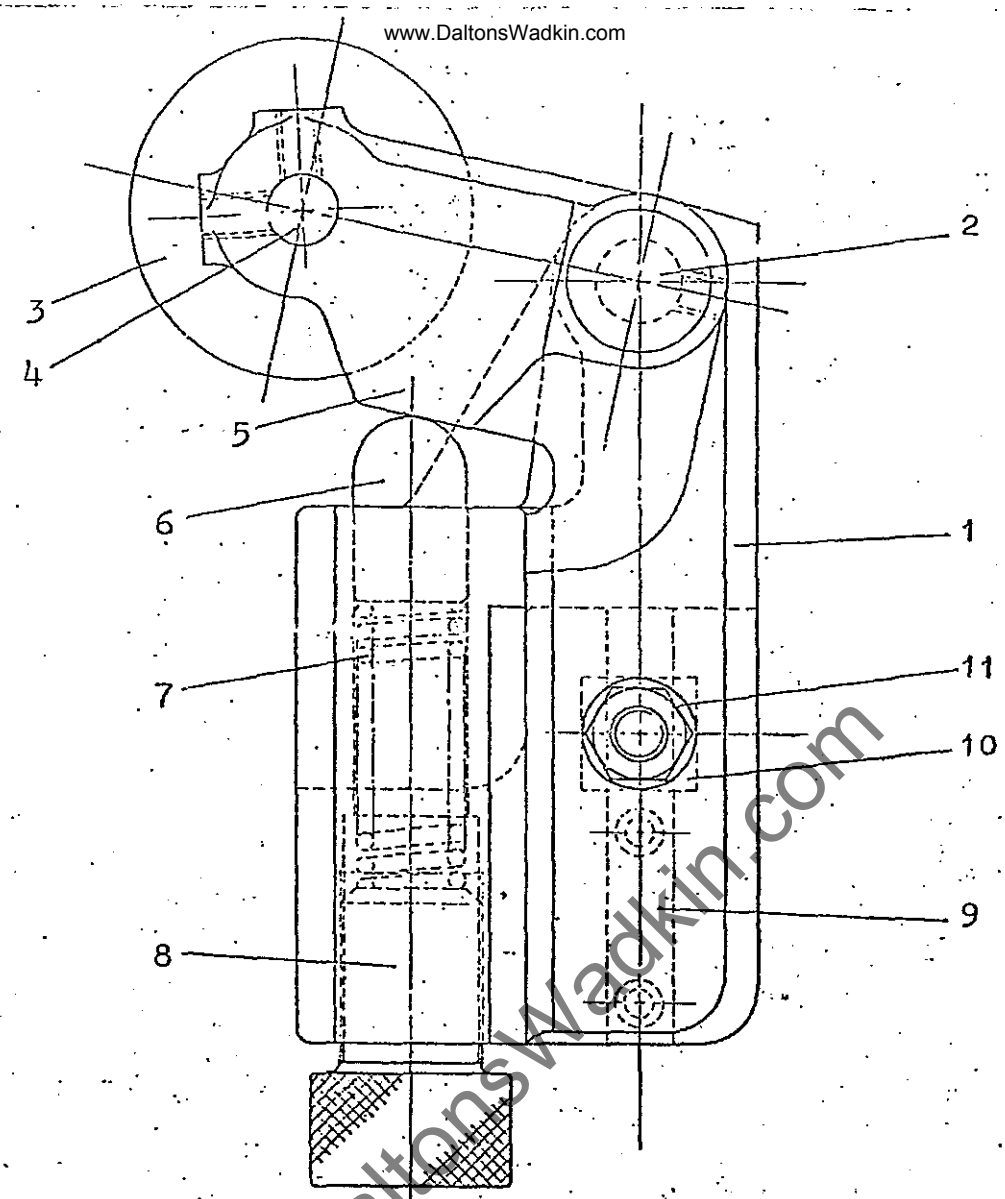
CANTING PRESSURE OVER 2nd BOTTOM HEAD

ITEM No.	DESCRIPTION	PART No.
1	CANTING HOLDER	FD 613
2	HANDWHEEL	FD 665
3	PRESSURE SPRING	WA 438
4	SHAFT for SPRING	FD 661
5	LOCKING STUD	FD 191
6	PRESSURE SHOE	FD 614
7	PLATE for SHOE	FD 664
8	3/8" x 1½" STUDS	K0508454
9	PIN for SHOE	FD 666
10	1/2" x 2¾" STUD	K0508476
11	CANTING PLATE	FD 645
12	ADJUSTING-SCREW	FD 662
13	LOOSE COLLAR	K0520101
14	PRESSURE ARM	FD644
15	STAR HANDWHEEL	K0521443

1.	Roller Cover	FD 133
2.	Roller Pin	FD 200
	⅛ gas Grease Nipple	K09 50 104
3.	Link Hinge Pin	FD 199
	Circlip ¾ ext.	K30 09 107
	⅛ gas Grease Nipple	K09 50 104
4.	Pressure Slide Bracket	FD 5045
5.	Pressure Roller	FD 134
6.	Elevating Screw	FD 355
7.	Crank Handle	FD 365
8.	Bracket for Screw	FD 5042
	⅛ gas Grease Nipple	K09 50 104
9.	Locking Bolt	FD 382
10.	Sliding Bracket	FD 5044
11.	ROLLER LINK	Fo 197



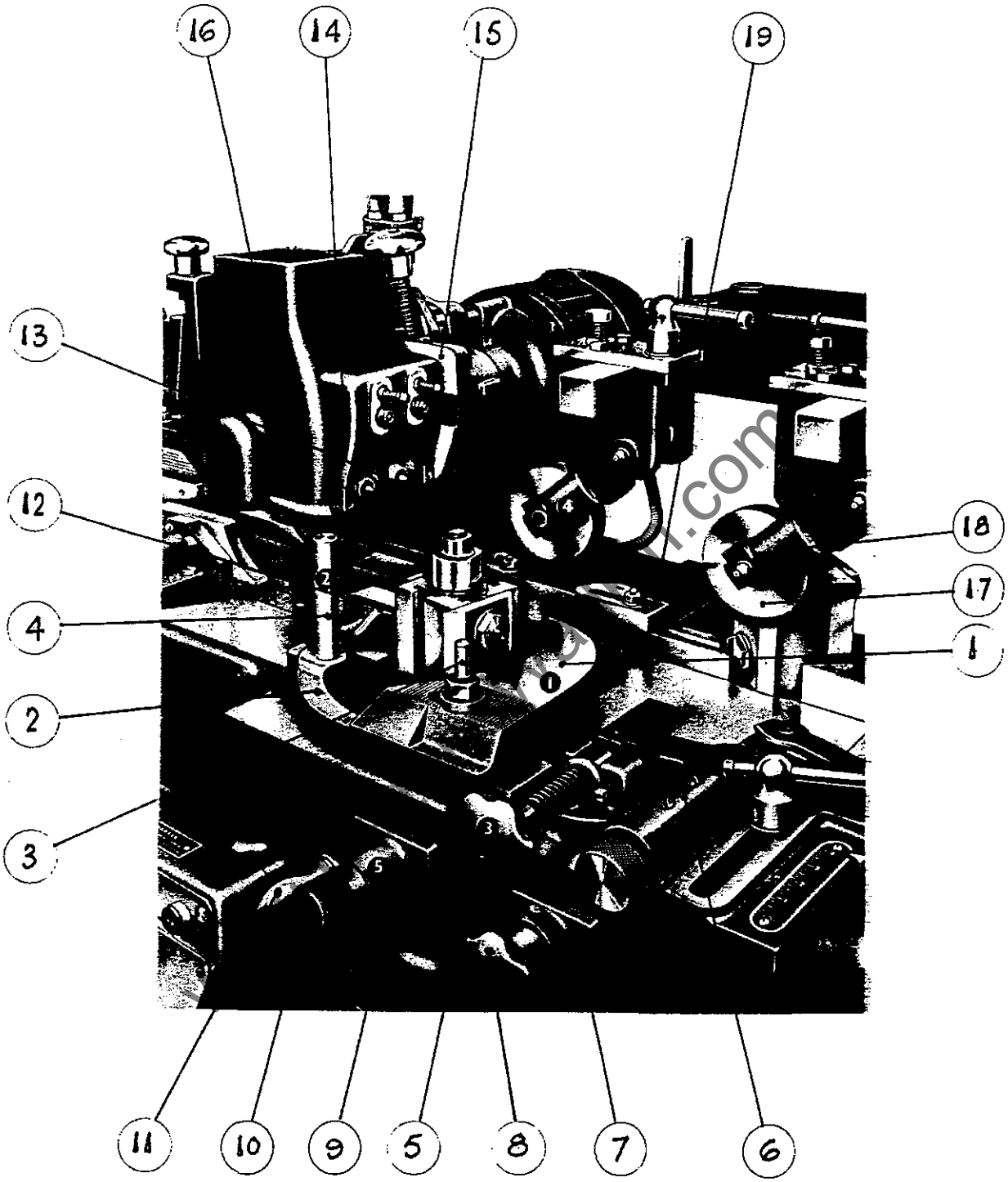
Roller Pressure over 1st Bottom Head



ITEM No.	DESCRIPTION	PART No.
1	SIDE PRESSURE BRACKET	FD 313
2	HINGE PIN	FD 366
3	PRESSURE ROLLER	FD 546
4	ROLLER PIN	FD 543
5	PRESSURE ARM	FD 314/A
6	SPRING PLUNGER	FD 459
7	SPRING	RJ 116
8	ADJUSTING SCREW	FD 458
9	CHECK STRIP	FD 188
10	LOCKING BOLT	FD189
11	½"w NUT AND WASHER	
12	ROLLER BEARING(not shown)	LJ17DD

SIDE PRESSURE ASSEMBLY

BEFORE AND AFTER BOTTOM FEEDROLLERS

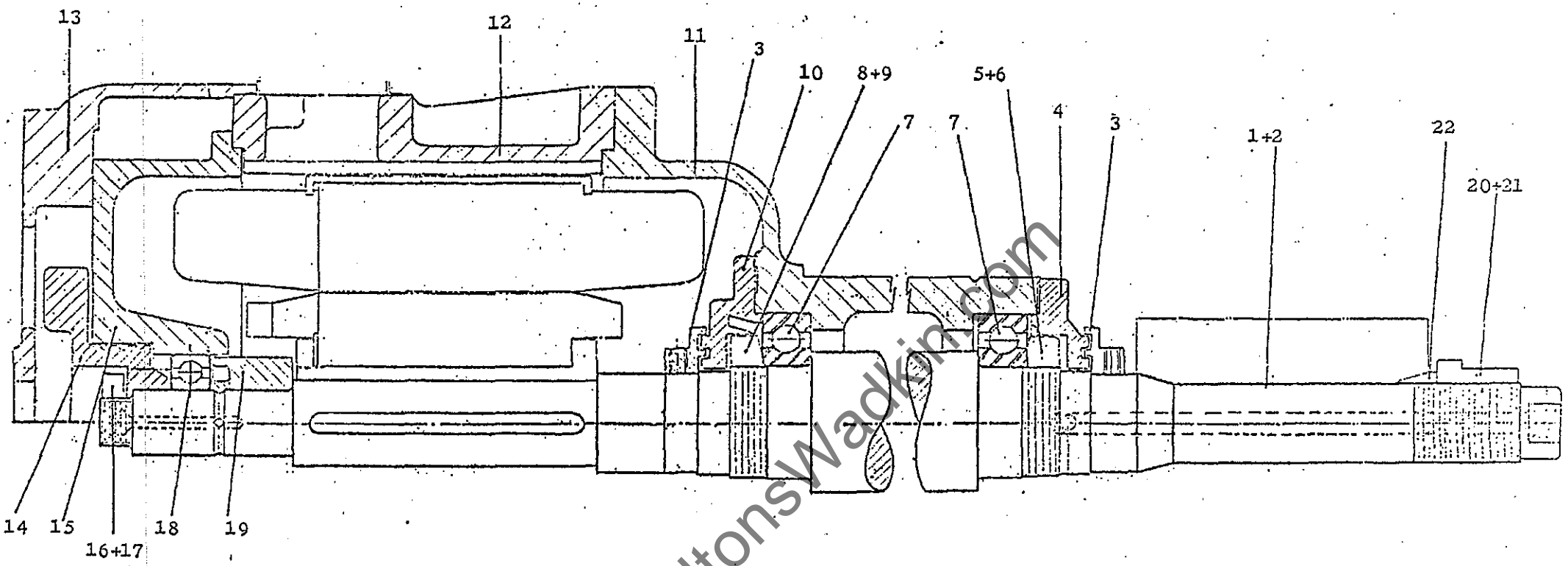


SIDE HEADS AND ASSOCIATED PARTS

4FD PLT 73.

SIDE HEADS AND ASSOCIATED PARTS.

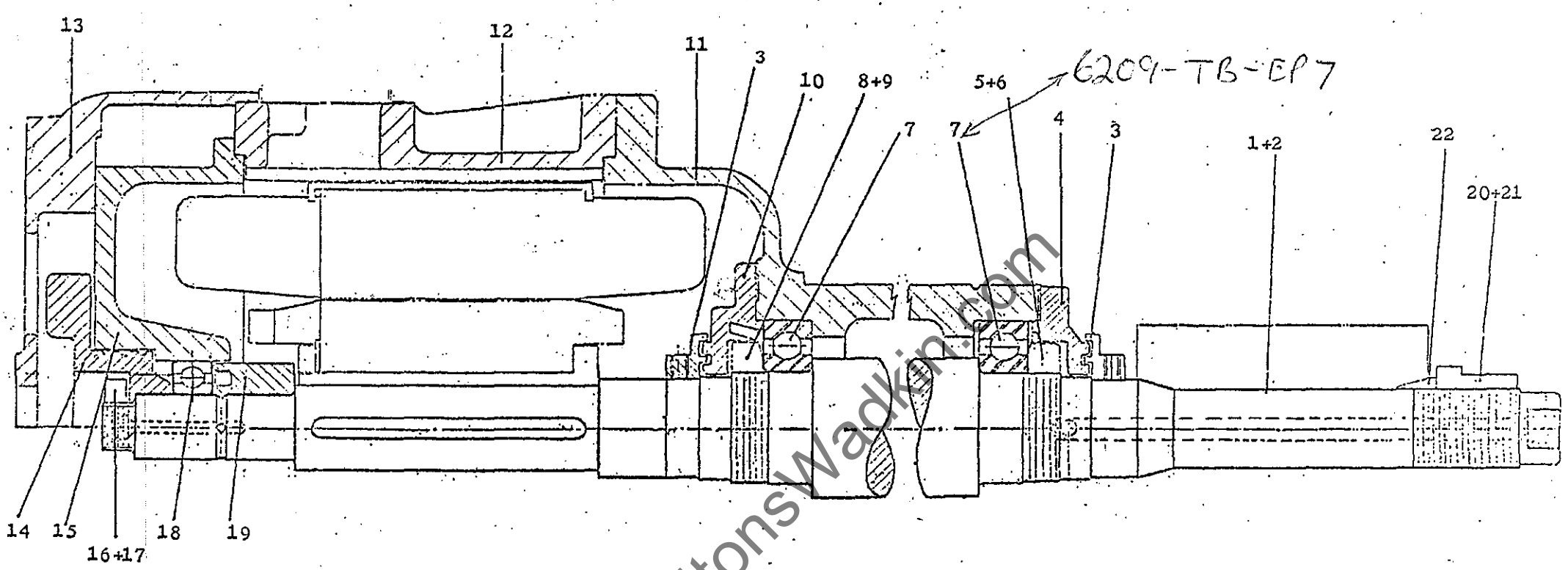
ITEM No.	DESCRIPTION	PART No.	REMARKS.
1	CHIPBREAKER SHOE	FD507	
2	SWINGING ARM	FD422	
3	LOCKING STUD	FD493	
	SERRATED WASHER	FD492	
	⅝" HEX NUT	K.0510108	
4	PIVOT PIN FOR ARM	FD494	
5	STUD FOR TENSION SPRING	FD457	
	TENSION SPRING	RJ116	
	STAR HANDWHEEL	K.0521442	
6	SIDE PRESSURE BRACKET	FD410/A	
	PRESSURE ROLLER	FD547	side pressure
	PRESSURE ARM	FD411/A	before side
	ROLLER BEARING LJ17/DD	K.0601197	head
	ROLLER PIN	FD544	
7	SCREW BRACKET FOR FENCE S. HEAD	FD406	
	ADJUSTING SCREW FOR F.S.H.	FD467	
8	STAR HANDWHEEL	K.0521446	
	ADJUSTING NUT FOR SCREW (F.S.H.)	FD415	
9	SCREW BRACKET FOR NEAR SIDE HEAD	FD407	
10	ADJUSTING SCREW FOR N.S.H.	FD468	
11	ADJUSTING HANDLE FOR SCREW	K.0521626	
12	PRESSURE BRACKET AFTER N.S.H.	FD427	
13	TOP HEAD CHIPBREAKER SHOES.	FD553/A	4" wide machines
	TOP HEAD CHIPBREAKER SHOES.	FD2330	5" wide machines
14	PIVOT BRACKET FOR SHOES	FD552/A	4" wide machines
	PIVOT BRACKET FOR SHOES	FD2328	5" wide machines
15	SWINGING ARM	FD699	4" and 5" wide machines
	GUIDE BRACKET	FD885	4" and 5" wide machines
	PIVOT PIN FOR SWINGING ARM	FD886	4" and 5" wide machines
16	TOP HEAD EXHAUST HOOD	FD638	4" wide machines
	TOP HEAD EXHAUST HOOD	FD2329	5" wide machines
17	TOP PRESSURE ROLLER	FD306	4"dia. x 1" wide
	ROLLER PIN	FD352	
	NARROW ROLLER	FD335	5½dia. x ⅜" wide
	NARROW ROLLER PIN	FD570	
	BALL BEARING FOR PIN	K.0601583	
18	ROLLER ARM	FD324	for 4" and 5½" rollers.
19	CLAMP BRACKET FOR FENCE	FD420	
	EXHAUST HOOD FOR FENCE SIDE HEAD	FD425	not illustrated.
	EXHAUST HOOD FOR NEAR SIDE HEAD	FD511	not illustrated.
	EXHAUST HOOD FOR FENCE SIDE HEAD	FD1411	For Models 5&6 Only



ITEM NO.	DESCRIPTION	PART NO.	ITEM NO.	DESCRIPTION	PART NO.
1	NAR SIDE CUTTER SPINDLE	FD 1026	12	STATOR FRAME	FD 951
2	FENCE SIDE CUTTER SPINDLE	FD 1027	13	COWL	FD 953
3	LABYRINTH FOR SPINDLE	FC 180	14	ROTOR FAN	FD 955
4	BEARING CAP	FC 43	15	END COVER	FD 952
5	BALL BEARING LOCKNUT (NEAR SIDE)	FC 182	16	BALL BEARING LOCKNUT (NEAR SIDE)	K0519153
6	BALL BEARING LOCKNUT (FENCE SIDE)	FC 181	17	BALL BEARING LOCKNUT (FENCE SIDE)	K0519154
7	BALL BEARING HOFF N 3349	K0501302	18	BALL BEARING SKF 402599	K0601292
8	BALL BEARING LOCKNUT (NEAR SIDE)	FC 207	19	SPACING SLEEVE	FD 978
9	BALL BEARING LOCKNUT (FENCE SIDE)	FC 208	20	NUT FOR SPINDLE (NEAR SIDE)	FC 156
10	BEARING CAP	FC 58	21	NUT FOR SPINDLE (FENCE SIDE)	FC 255
11	SPINDLE HOUSING	FD 1001/A	22	CENTRING COLLAR	FC 224

4FDPLT473

GENERAL SECTION OF VERTICAL SPINDLES ($1\frac{1}{4}$")



6209-TB-EP7

ITEM NO.	DESCRIPTION	PART NO.	ITEM NO.	DESCRIPTION	PART NO.
1	BOTTOM CUTTER SPINDLE	FD 977	12	STATOR FRAME	FD 951
2	TOP CUTTER SPINDLE	FD 976	13	COWL	FD 953
3	LABYRINTH FOR SPINDLE	FC 180	14	ROTOR FAN	FD 955
4	BEARING CAP	FC 43	15	END COVER	FD 952
5	BALL BEARING LOCKNUT (BOTTOM)	FC 182	16	BALL BEARING LOCKNUT (BOTTOM)	K0519153
6	BALL BEARING LOCKNUT (TOP)	FC 181	17	BALL BEARING LOCKNUT (TOP)	K0519154
7	BALL BEARING HOFF N 3349	K0601302	18	BALL BEARING SKF 402599	K0601292
8	BALL BEARING LOCKNUT (BOTTOM)	FC 207	19	SPACING SLEEVE	FD 978
9	BALL BEARING LOCKNUT (TOP)	FC 208	20	NUT FOR SPINDLE (BOTTOM)	FC 256
10	BEARING CAP	FC 43/A	21	NUT FOR SPINDLE (TOP)	FC 255
11	SPINDLE HOUSING	FD 954/A	22	CENTRING COLLAR	FC 224

4FDPLT473

GENERAL SECTION OF HORIZONTAL SPINDLES ($1\frac{1}{4}$")