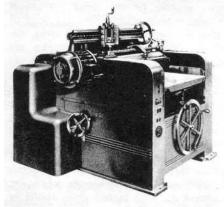
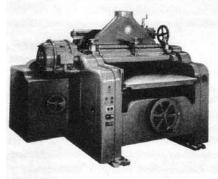
MICROMATIC DIVISION
345 EAST 48TH STREET HOLLAN
PHONE: (616) 392-1461

HOLLAND, MICHIGAN 49423

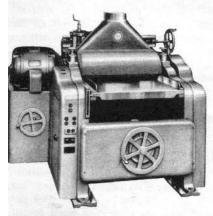
and Double Surface Wood Planers



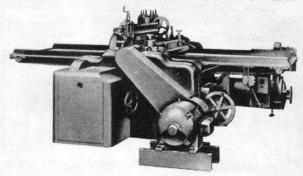
o. 4-L Single Surface, Wedge Adjusted Bed 4-roll planer. Capacity: 24", 26", or 30" × 8". Medium size for first cutting or finishing work. Net weight, 30", 5850 Lbs.



No. 44 Single Surface, Wedge Adjusted Bed, Heavy Duty 4-roll planer for first cutting and finishing work. Capacities: 26", 28", 30", 32", 36", 38", 40", 42", 44", 46", 50", 52" and 56". Net weight, 30", 7600 Lbs.



No. 66 Single Surface, Wedge Adjusted Bed 6-roll planer for first cutting and finishing work. Capacities: 30", 32", 36", 38", 40", 42", 44", 46", 50" and 52". Net weight, 30", 8500 Lbs.



MICRO-SURFACER

Single Surface machine for planing thin highly flexible materials. Patented work platen rigidly holds down stock during the feeding and cutting operation. Sizes: 26", 28", 30", 32", 36", 38" 40", 42", 44", 46", 50", 52" and 56". Wider widths built to customer specifications. Weight, 40", 11,000 Lbs.

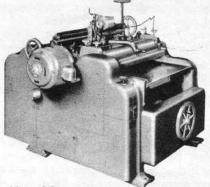
N THE WIDE RANGE OF MODELS AND SIZES offered by Buss the right machine can be selected for each type of production set up.

These machines have a number of features that give instantaneous adjustments and great flexibility.

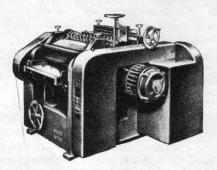
Typical of these features are the (shearing bar); which prevents knots and large slivers from being carried around the cutterhead and jamming the pressure bar; the (lower roll micrometer control) which changes the machine from rough to finish work with the flick of a dial; the (instantaneous pressure bar control) gives instant adjustment for knife wear and gives the right pressure for each run of stock. One shot oiling for automatic lubrication is available on all models.

Consult our Engineering Staff for your special planing problems.

EX-CELL-O CORPORATION MICROMATIC DIVISION

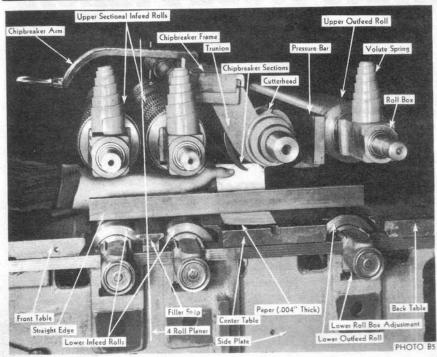


No. 88 Double Surface, Wedge Adjusted Bed 8-roll planer for first cutting and finishing work. Capacities: 30", 36", or 40" x 7. Net weight, 30", 12500 Lbs.



No. 55 Double Surface, 4 Screw Adjusted Bed for planing rough lumber. Capacities: 20", 30", 59" x 14", 59" x 16". Net weight, 30", 10000 Lbs.

WOOD WORKING PLANERS



The planer is one of the most important machines in the woodworking industry, and in furniture and lumber companies all over the world, millions of board feet of lumber are planed daily. This high productivity and accuracy in planing is a result of almost two centuries of experience and technical development beginning with the inventions of Sir Thomas Bentham in the 18th century and continuing through the important developments in the United States after 1800. In the early days, there were few mills and most of the lumber processing was done by hand. The first installations of woodworking machinery were opposed by carpenters, who feared they would be thrown out of work. Some of the early machinery had to be guarded for fear it would be destroyed.

Mill owners found it hard to pay for the relatively expensive machinery, but after these machines were installed, they rapidly paid off the investment through the great savings in labor

One of the earliest planers, a Bramah, was invented about 1802, and greatly resembled a

metal planing machine. On this first machine, the work was clamped to a traveling bed and was moved past a revolving arm on which were mounted fly cutters. After the work had been fed past the cutters, they were fed down, the direction of the travel reversed, and a new cut taken. These early machines and others were constructed mostly with wooden frames, but in the 1860's the manufacturers of woodworking machinery replaced the old wooden frames with cast iron members.

The woodworking industry continued to prosper, and with it the demand grew for specialization of machinery. To fill this demand, many types of surfacers are now available. Buss Machine Works has responded to specialization by developing the most complete line of single and double Surfacers that is available in the market. In fact, Buss is the only manufacturer

that builds planers as exclusive woodworking products.

The small wedge bed planer, model 4L, is Buss' answer to a demand of a vast majority in the woodworking industry. A relatively inexpensive surfacer that will handle the bulk of all planing requirements with the accuracy and dispatch formerly available only on the larger machines. The Simultaneous Micrometer Control for the lower feed rolls, which changes the setting of the rolls from rough to finish work with the flick of a dial, is only one example of the flexibility which is built into this machine.

The large wedge bed planers for high production and pin-point accuracy necessary for cabinet surfacing are typified by the models 44 and 66. These models do exceptionally fine cabinet work, and are daily surfacing materials with the accuracy formerly associated with the metal planing machinery. This has been made possible by Buss building their models of the rugged construction necessary to hold the adjustments and accuracy through the years, and incorporating into these machines micrometer controls necessary to control processing of the materials.

These machines are not only used for fine finishing work, but are used in connection with conveyorized units. Lumber in these setups is carried in and out of the machine on conveyor belts, some plants processing more than 30,000 feet of lum-

ber per day.

The double Surfacer is the largest of surfacers. These are made in both the screw bed and wedge bed type. The Buss No. 55 is a screw bed double Surfacer, used principally for the sizing of rough lumber. It is built to take the tough jobs of sizing lumber with cuts up to 11/2", yet it has the adjustments and precision to do fine planing within its capacity of butted stock 14" or longer.

For plants requiring cabinet double surfacing, the Buss No. 88 is a planer that gives the finest of finishing work. Its fine adjustments and capabilities have produced the world's finest furniture. It is beautifully constructed, and is capable of

high production work on all stock.

The specializing in planers has resulted in the development of special planing machinery. The Micro Surfacer is a patented Buss development for the precision planing of extremely thin and abrasive materials, such as tempered hard board, rubber and vinyl sheeting, extruded plastics, laminates and other thin materials. Carboloy knives have been used on these production operations since 1950. There also is available specialized machinery for planing of softboard materials with hop-

per and automatic production feeds.

Buss Machine Works is continually developing new models and improving current models on the sound basis of experimental work carried out by Buss engineers and independent research organizations. New models are not added to the Buss family of fine planers without first testing their performance in every respect. In addition to its own activity in planer development, Buss support research, the sole purpose of which is to improve the techniques of planing under modern production conditions. The Buss' research and development program aims to provide the trade with improved techniques in the planing of materials and to produce planers for the industry that will not only speed up production but also give increasingly finer work.

WOOD PLANER ADJUSTMENTS

Many of the difficulties which arise in planing operations result from not having the complete over-all picture of the planer parts and adjustments. The text and illustrations on the following pages show with pictures the inside of a planer and now the parts are located and work in relation to each other. Photos shown are not all complete assemblies, and are of certain Buss planer models, but the principles of adjustment apply to all planers.

FOUNDATION

A foundation print for the machine is forwarded to you before the planer is shipped and is attached to the acknowledgment of the order. Also you will find with some models a foundation plan in the parts list book. Please carefully follow instructions before pouring cement. The machine should NOT be grouted in and should rest on top of any cement foundation and NOT be bolted down, the weight of the machine will be sufficient to prevent movement. We recommend eveling the machine with cedar shingles.

WIRING

A wiring diagram is attached to the door of the electric conrol panel door, in some models a wiring diagram can be ound in the parts list book for reference.

UBRICATION

The machine is oiled and greased before shipment. The autterhead bearings may be grease or oil lubricated depending on the model. If the cutterhead has oil caps it should be oiled laily with a good grade of 15W machine oil. If the cutterhead bearings run in grease, the housing will be equipped with a ½" pipe plug. The cutterhead bearing should be regreased every 500 hours of operation with a high grade lithum base No. 1 grease such as Amolith No. 1 or similar product. Very important—keep your supply in dust-free conainer. A zerk fitting is not provided as the oiler will then prease every day which should not be done as it will cause overheating of the bearing.

The speed reducer unit runs in heavy oil 600W and should be drained and refilled once a year.

All other oiling points are equipped with zerk or oil cap ittings and should be serviced every day.

If your machine has a one-shot oiling system a push on the andle every day lubricates the machine except for the cutteread bearings, speed reducing unit and grinding equipment. 10W or 15W oil should be used in the Bijur system. The

use of heavy oil will tend to clog the system. A filter in the reservoir should be washed out or replaced at least once a year. If the handle on the reservoir snaps down, there is a broken line in the system or the oil level is too low.

STARTING

Machine has been tested for several hours under actual planing before leaving plant, and adjustments are set for cabinet work. Machine should be cleaned of protective coating of grease. Inspect thoroughly to see if any parts have been damaged in shipment. Turn cutterhead around by hand to see if it is free. Check electric connections to see that motors are running in the right direction. After running idle several minutes check bearings and motors. The cutterhead bearings may run hot but if the machine is leveled correctly there is no cause for alarm. Run several waste boards through to clean off all grease and oil from rolls and tables. If there is anything you do not understand in the operation of the machine call Buss Machine Works, Holland, Mich., telephone EX 2-2341, Service Department.

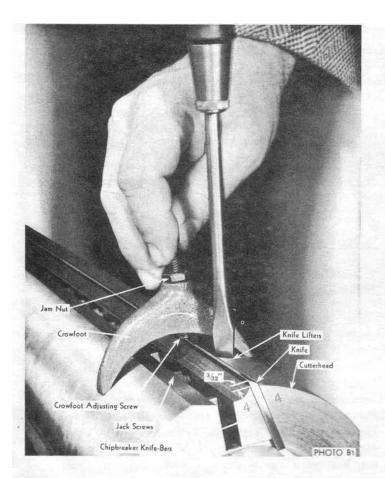
CUTTERHEAD BALL BEARING

Should it become necessary to change a ball bearing, use a bearing puller. Clean the journals carefully. Warm the new bearing in its original package by laying it on a steam coil or similar method, warming it to about 60° above room temperature. The bearing can then be slid on or lightly tapped on the journal. Be extremely careful not to get dirt or grit into the bearing during re-assembly. The principle cause of antifriction bearing failure is dirt in the bearing.

If you wish to repack a bearing, wash in a bath of kerosene and dry thoroughly. Do not spin dry with air hose. Apply grease in the depressions of the spacer only on both sides.

VARIABLE FEED

Run motor up and down daily to keep a light film of grease on variable feed pulley to prevent freezing. Grease with Amolith No. 2 or similar product.



KNIFE SETTING

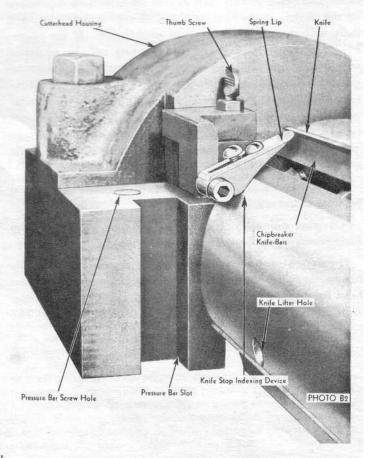
Cutterhead knives are initially set 3/32" from the lip of the chipbreaker knife bars and when ground down to 1/32" should be reset. Clean and oil jack screws before turning in. When new knives are put in, the chipbreaker knife bars should be taken out and oiled and cleaned. Replace the knife bars so that number on cylinder and chipbreaker knife bars correspond. When resetting knives, turn the jack screws in until the lifting screws can just raise the knife. Place the crowfoot knife setting device on the cylinder and move crowfoot back and forth over knife edge while using screwdriver to turn lifters up, thus slowly raising the knife. When the knife edge just ticks the crowfoot screw, the right height has been reached. Do this at several points along the length of the knife to make certain the knife is the same height its entire length.

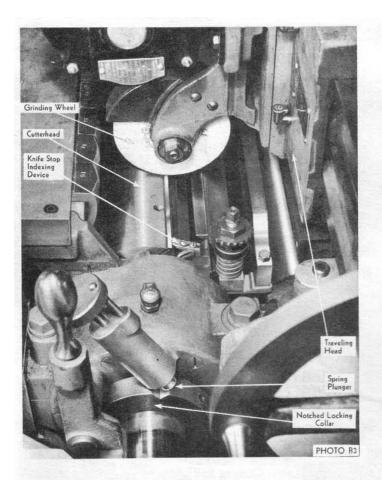
Tighten the knives lightly in the head by turning jack screws out with wrench. Do this with all four knives. Go around the cylinder several times, each time tightening the knives a little more. This is important, because even stress must be put on each of the slots.

The height setting of the knives can be changed by loosening jam nut of adjusting screw crowfoot and setting adjusting screw to desired height.

KNIFE INDEXING

Clean the knives and chipbreaker knife-bars of wood dust and pitch before grinding. The knives are set at the proper position for grinding by means of the knife stop indexing device, which is mounted on the flat part of the cylinder housing and held in place by a thumb screw. The spring lip of the knife indexing device is placed under the edge of the knife. Do not let the lip of the knife stop indexing device rest on the chipbreaker knife bar. The cutterhead is locked in place against the knife stop device by a spring plunger which acts on a notched collar on the end of the cylinder. The bevel of the knives can be changed by adjusting the projection of spring lip.





GRINDING

Knives should be ground every day if the machine is in heavy production. Before grinding, clean off and oil the grinding rail. Clean dust, pitch, and glue from knives and chipbreaker knife bars before grinding. Place the knife stop indexing device on the flat of the housing and lock with thumb screw. Rotate the head until a knife rests against the stop. Remove safety cotter pin from spring plunger handle, and let plunger lock cylinder against knife stop device by pressure against notched collar on cylinder. Lock grinding motor unit evenly on traveling head with thumb screws. Feed grinding unit down until grinding wheel scrapes knife when turned by hand. Raise wheel slightly off knife; start grinding motor, and take a pass over the length of knife to see that the first cut will not be too much. Feed grinding wheel down until wheel is taking about .002 cut. Make several passes and then go to next knife. One pass across a 30" knife should take approximately six seconds.

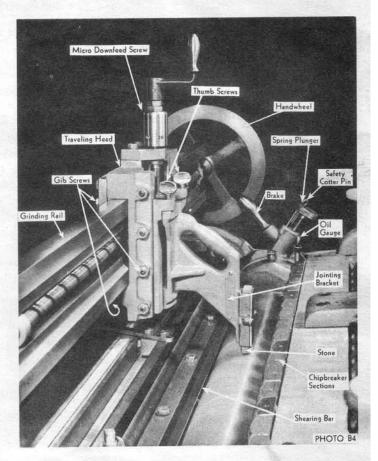
Heavy cuts and slow feed travel will burn the knives. Grind up to the "white line" or up to the cutting edge. Do not try to finish one knife first. Grind knives in the order of 1, 2, 3, 4; then 1, 4, 3, 2. This helps compensate for grinding wheel wear. By grinding often, only light passes, are necessary to bring the knives to correct sharpness. Be sure to remove knife stop indexing device and place safety cotter ping in spring plunger handle before starting machine.

JOINTING

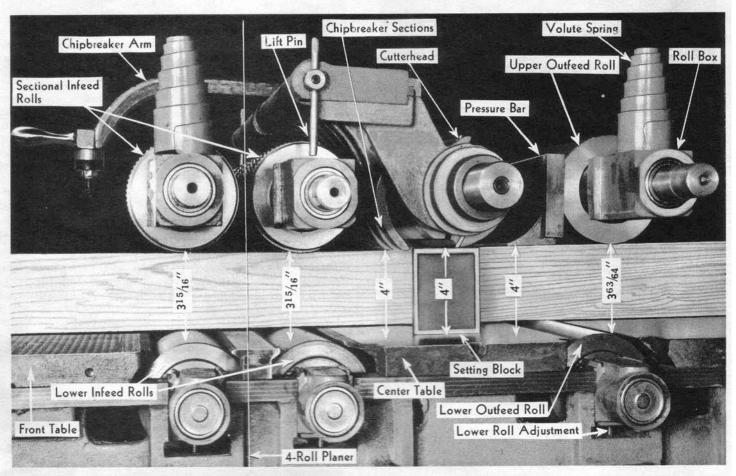
To joint, place jointing bracket on traveling head and lock in place evenly with thumb screws. Feed the jointing bracket down until the knives when rotated by hand just tick the stone. Back stone slightly away and start cutterhead. Feed stone down slowly until a faint whispering sound can be heard. Make several passes over the length of the cylinder. Stop cutterhead and check knives. When all four knives have a faint silver line on the cutting edge, they have been brought into the cutting circle. If one or two knives joint heavier than the rest, take more care in grinding.

Check rail occasionally for parallelism with cutterhead. Run jointing bracket down until a piece of paper can just be pulled between it and the body of the stationary cylinder. Check both ends of cylinder. If paper is tight at one end and loose at the other, the rail is out of alignment. It can be leveled by loosening slightly the bolts which hold rail to the side frames and inserting spacers between the side frame and leg pad.

Check traveling head occasionally to make sure that there is a snug fit between it and the rail. Check to see that there is a sliding fit between the traveling head and downfeed slide. If parts are loose, free jam nuts and turn in gib screws until there is a snug fit on all sliding parts, then lock setting with gib jam nuts.



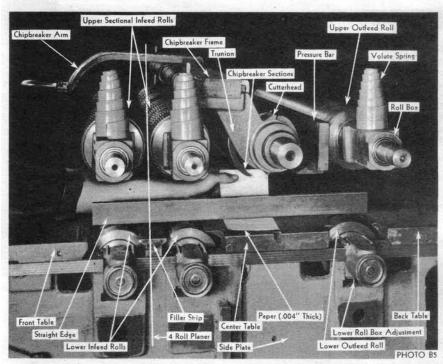
ADJUSTMENTS FOR SINGLE SURFACER



Above photograph is a setup of the relative positions of the working parts in a single surface planer when properly adjusted.

- A. Set the lower rolls .003"-.006" above center table for finish work; .008"-.010" for rough work (See lower roll adjustment for particulars).
- B. Place setting block on center table. Raise bed until the knives when rotated, just touch the setting block. Now a height has been established from which the other parts in the planer can be adjusted. Slide the setting block under the pressure bar and adjust bar down to block. (See pressure bar adjustment) Check this at both ends to see that the pressure bar is not cocked. Now slide the setting block under the chipbreaker sections and adjust chipbreakers to the block. (See chipbreaker adjustment). By this method the chipbreakers, cutting circle of the knives, and pressure bar will all be parallel and at the same height.
- C. Lower bed 1/64" and adjust upper outfeed roll (see upper outfeed roll adjustment) until setting block fits snugly between upper and lower rolls.
- D. Then lower bed 3/64" more. Adjust upper sectional infeed rolls (see upper sectional infeed roll adjustment) until setting block fits tightly between upper and lower rolls.

LOWER ROLL ADJUSTMENT



Above photograph is a setup of the relative positions of the working parts in a single surface planer.

For finish planing, the lower rolls should be set .003"-.006" above center table. If the planer has the independent micro screws and jam nuts under the roll boxes, an easy method for roll setting is to adjust the rolls so that a sheet of paper can be drawn between a straight edge and the center table (a sheet of paper is about .004" thick).

For rougher work, the rolls are set .008"-.010" above the center table. Be sure that the rolls are set the same distance above the center table at both ends of the rolls. This can be checked by making certain the sheet of paper is free under the straight edge at both ends of the center table.

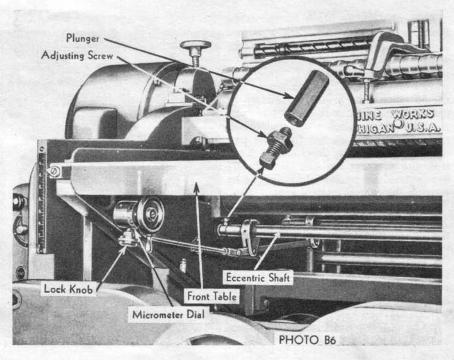
Front and back tables are only for supporting stock and are set 1/64" below center table.

MICROMETER CONTROL FOR LOWER ROLLS

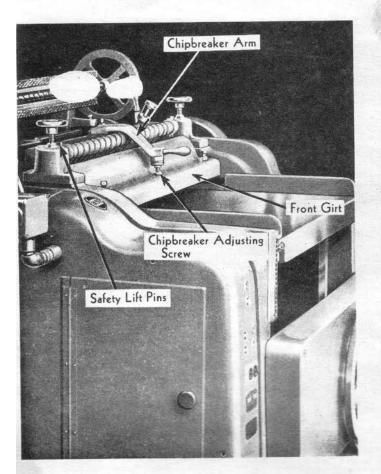
If the planer has the Simultaneous Micrometer Adjustment for the lower rolls, the desired setting of the rolls above the center table can be made by loosening the micro locking knob and turning the micrometer dial to that setting. Be sure to relock the roll setting.

The dial setting can be checked for accuracy by setting the rolls at .004 on the dial and then checking the height of the rolls above the table by the straight edge and paper method.

If the dial setting does not correspond accurately enough to the actual setting, the rolls can be brought to the dial setting by adjusting the plunger and adjusting screw that rides on the eccentric shaft underneath the roll boxes. Be sure to oil the plunger underneath the roll boxes occasionally so it will not freeze.



CHIPBREAKER ADJUSTMENT



Place setting block on center table. Raise bed until the knives when rotated will just touch setting block. Slide setting block under the chipbreaker sections and adjust to block by means of the chipbreaker adjusting screw in the center of the front girt, under the chipbreaker arm. The chipbreaker sections should be the same height as the cutting circle of the knives, and when the knives are ground should be readjusted.

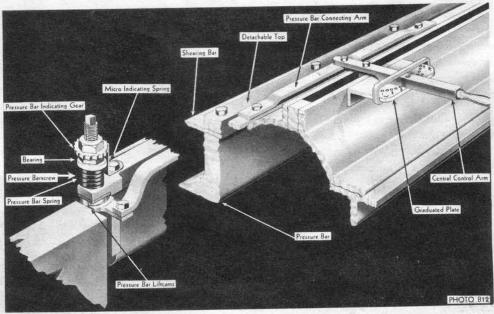
The chipbreaker frame has safety lift pins which are positioned 1/4" above front roll boxes. When an exceptional heavy cut is being taken, the roll boxes raise, contact the safety lift pins, and pivot the chipbreakers concentric with the cutting circle.

In conveyor operations check periodically to make sure safety lift pins are positioned above roll boxes. Otherwise in case of a jam the sections can be forced into the cutterhead.

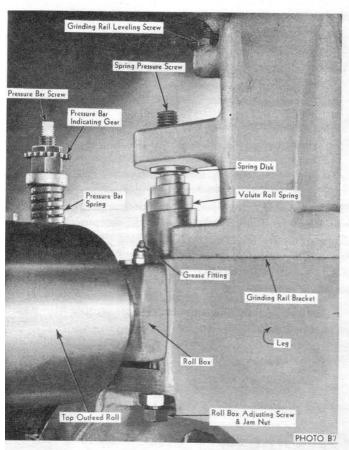
PRESSURE BAR ADJUSTMENT

Place the setting block on the table. Raise bed until the knives when rotated just touch the setting block. Slide the setting block under pressure bar. If the planer has independent pressure bar screws on each end of the pressure bar, the bar should be brought to the block one end at a time. Make sure that pressure bar is parallel with the center table. If the planer has the Buss patented Quick-Acting Micrometer Control, the pressure bar can be instantly brought to the setting block height by moving the central control arm.

When the knives have worn so that the micrometer control lever cannot bring the pressure bar to the level of the cutting circle, the control must be reset. Set the control lever arm at .005" and then using the setting block as before, independently adjust with a wrench the end pressure bar screws. This now gives .035" raise of pressure bar for adjusting.



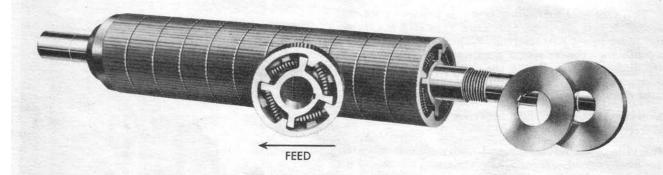
UPPER OUTFEED ROLL ADJUSTMENT



This roll should be set 1/64" lower than cutting circle of knives. To do this, place setting block on table and raise bed until the knives when rotated by hand will just touch the setting block. Lower the bed 1/64". Adjust upper outfeed roll by means of a screw and jam nut under the roll box. Adjust upper outfeed roll until setting block will slip through snugly between upper and lower outfeed rolls. Do not touch the lower rolls, as these are set independently of upper roll adjustments.

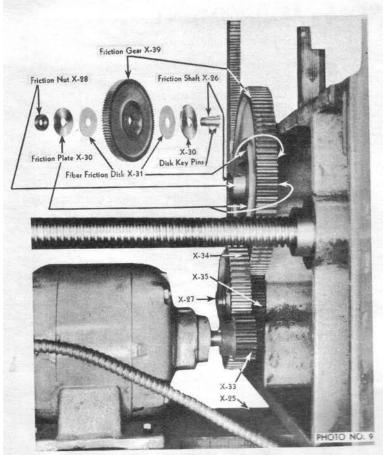
The upper outfeed roll is spring loaded and the pressure on the roll can be varied by turning screw above roll box. Turn both screws evenly, as it is important that the pressure be equal on both ends of the roll.

UPPER SECTIONAL INFEED ROLL ADJUSTMENT



After you have adjusted the upper outfeed roll, lower bed 3/64" more and adjust upper sectional infeed roll until setting block will just slip through upper and lower infeed rolls. These rolls are adjusted by screws and jam nuts underneath the roll boxes. These rolls are spring loaded and pressure can be varied by adjusting screws above roll boxes. Be sure of even pressure on the rolls. This roll is set 1/16" below cutting circle of knives.

When the outer corrugated sections of the sectional roll do not maintain their fairly normal central position, the springs need replacing. Remove roll from machine. Strip all sections off shaft, clean, respring, and pack with grease. Place each section on the shaft so that the inner spider lugs will drive against the outer section lugs when the roll is feeding. Do not drive against the springs. Be sure to replace dividing discs between the sections.



POWER HOIST Models 44, 66, and 88

Power hoist, through motor, powers the bed through a large gear which is fitted with friction fiber slip disks. When the table is overloaded, or there is a jam, these disks will slip and protect the machine. If the power hoist is slipping for no apparent reason, tighten the nut by hand. If the disks still slip, remove the nut and check disks to see if oil or dirt is on the disk. Be sure the two small pins are intact, if not, replace.

Do not tighten the nut excessively because the protection will then be eliminated.

BIJUR ONE SHOT OILING

Your machine may be equipped with a built-in Bijur central lubricating system—by CORRECT lubrication of all bearings served, it assures smooth operation of your machine for years, if properly maintained.

The Bijur system consists of three basic elements: (1) a lubricator (pump) which periodically forces a measured volume of oil into (2) a single line of distributing tubing branched to supply oil to the bearing surfaces through (3) Meter-Units which proportion the correct oil film to each bearing.

OIL: Use only non-compounded clean mineral oil 10W or 15W.

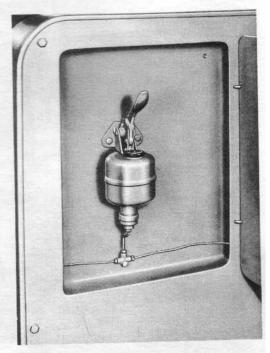
OPERATION: This One-Shot lubricating system is pre-set by the machine manufacturer for best operation. Lubricator Type HIA is a spring discharge piston pump in a 1 pint reservoir. Pushing up on the handle against the stop fills the cylinder with a predetermined volume of oil. Spring pressure discharges the oil into the distribution system automatically, and returns the handle to the original position. Lubricator must be operated daily.

STARTING A NEW MACHINE: Fill reservoir; operate lubricator until oil shows freely at all bearings.

MAINTENANCE: Check oil level daily and refill reservoir when required. Replace filter assembly annually. Check system periodically for loose or broken tubing, worn hoses, loose fittings and connections.

(handle snaps back if reservoir is empty), broken or cracked tubes, loose connections, flattened lubricator outlet tube, clogged filter, or worn piston leather. If all are satisfactory and machine is running at operating temperature, increase oil feed. Relocate stroke adjustment pin in next lower holes of links. Run machine and check all bearing points thoroughly before further adjustment. Too much oil at all bearings — after full run-in period of machine, reduce oil discharge by relocating stroke adjustment pin in next higher holes of links. For too little or too much oil at one bearing, see other side.

SERVICE PARTS: Check the Bijur parts list sheet enclosed with the maintenance sheets when ordering repair parts.



WOODWORKING PLANER HINTS

IF CLIP OR SNIPE APPEARS AT BEGINNIING OF BOARD:

- 1. Pressure bar may be set too low.
- 2. Chipbreaker may be set too high.
- 3. Upper infeed sectional roll may be set too high.
- 4. Lower infeed roll may be set too high.
- 5. Spring tension may be too light on pressure bar.

IF CLIP OR SNIPE APPEARS ON END OF LUMBER:

- Pressure bar may be set too high not even with cutting circle.
- 2. Lower outfeed roll may be set too high.
- 3. Upper outfeed roll may be set too low.
- 4. Lumber may not be butted.
- 5. Grain may be running against knives.

IF KNIVES TEAR OUT LUMBER:

- 1. Feed may be too fast.
- 2. Joint on knives may be too heavy.
- 3. Moisture content may be too low.
- 4. Head may be running too slowly.
- 5. Cut may be too heavy.
- 6. Cutting angle may be too large.
- 7. Grain may be running against knives.

IF KNIVES RAISE THE GRAIN:

- 1. Joint may be too heavy a light joint is the best.
- 2. Feed may be too fast.
- 3. Cutting angle may be too large.
- 4. Head may be running too slowly.
- 5. Moisture content of lumber may be too high.
- 6. Cut may be too heavy.

IF CHIP MARKS APPEAR ON LUMBER:

- 1. Blower system may not be strong enough.
- 2. Feed may be too fast.
- May be loose connection in blower system no suction.
- Exhaust pipe may point at right angles to main blower pipe.

IF PANELS ARE TAPERED ACROSS THE WIDTH:

- Center table may not be set parallel with body of cylinder.
- Grinding rail may not be set parallel with body of cylinder.
- 3. Center table may be worn.

IF UNDESIRED POUNDED GLOSSY FINISH APPEARS:

- 1. Knives may be dull.
- 2. Feed may be too slow.
- 3. Joint may be too heavy.

IF WASHBOARD FINISH APPEARS:

- 1. Knives may have been driven back into the head.
- 2. Machine may be completely out of adjustment.
- 3. Joint may be too heavy.

IF REVOLUTION MARK SHOWS UP:

- 1. Knives may be ground poorly.
- 2. Knives may need jointing.

IF LINES APPEAR AT RIGHT ANGLES TO THE KNIFE MARKS:

- Knives may have checkered and nicked up by overgrinding and taking temper out of steel.
- 2. Chips may have wedged between rolls and tables.
- 3. Pressure bar may be dragging.

IF STOCK TWISTS IN MACHINE:

- 1. Pressure bar may be cocked.
- 2. Upper outfeed roll may be cocked.
- Upper outfeed roll may have uneven spring tension on it.
- 4. Lower rolls may be cocked.

IF KNIFE LIFTERS MUST BE REPLACED FREQUENTLY:

- 1. Jack screws may not be tight in slots and knives drive back, shearing the lifters.
- 2. Knives are too dull.

IF MACHINE SQUEALS:

1. Pressure bar may be dragging on stock.

IF STOCK STICKS OR HESITATES IN MACHINE:

- 1. Pressure bar may be set too low.
- 2. Lower rolls may be set too low.
- 3. Upper rolls may not be set low enough.
- 4. Cut may be too heavy.
- 5. Coaxer board may help lumber through machine.

IF MACHINE IS NOISY AND VIBRATES AND POUNDS:

- 1. Knives may be too dull.
- 2. Machine may not be leveled up correctly.
- 3. Machine may not be on solid foundation.
- 4. Pulley belt may be jumping on pulley.
- 5. Pressure bar may be set too low.

IF MOTORS KICK OUT:

- 1. Knives may be dull, thus overloading motors.
- Pressure bar may be set too low, putting drag on motors.
- Motor may be drawing high current because other machinery in the plant in use has pulled down the voltage.
- 4. Machine may be out of adjustment.
- 5. Lower rolls may be set too low.

IF POWER HOIST SLIPS:

- 1. Nut may be too loose on friction gear.
- 2. Oil may have gotten into fiber discs.
- 3. Pin may be sheared on friction shaft.

In compiling the above data, we would like to call to the reader's mind that sometimes a particular machine is not suited for the job it is required to do; also, many times a machine is worn beyond adjustment, and regardless of what is done to correct planing difficulties, it cannot be made to do good work. These causes and cures, as we have outlined, may help correct some of the difficulties, but again, they may not eliminate all of them.

Our Engineering Department would be glad to be of any assistance to you on planer problems, regardless of the make of equipment.

PLANE FACTS

Many of the problems of modern planing can be understood if a study is made of the heart of the planer, the cutterhead.

In placing the knives in the cutterhead, a great deal of care must be given to the balancing and securing of these knives. When the knives come in from the manufacturer, they have been balanced in pairs, and the balanced pairs are back to back in the package. When these are used, the balanced pairs should be put opposite each other in the cutterhead.

For most work, the knives are set 3/32" from the lip of the chipbreaker knife bars with the knife lifters. The knives are held in the head by the jack screws in the chipbreaker knife bars.

There is a mistaken idea that the knife lifters serve the purpose of holding the knives in the head, and that the tighter they are secured in the head, the more secure are the knives. This is not true. The knife lifters are only for the purpose of lifting or positioning the knives. After the knives are positioned and locked in the head, these lifters should be tightened only with firm pressure. If the operator shears the knife lifters quite frequently, he is either putting too much pressure on them, or not securing the chipbreaker knife bars tightly in the head with the jack screws.

In setting the knives, the knife projection from the chipbreaker knife bars has a visible influence on surface defects. Chipping out is reduced with shorter knife projection, because with the cutting edge closer to the chipbreaker knife bars, the chips are broken up faster and the chip is shorter. On the other hand, the more the knife projects from the chipbreaker knife bars, the longer the chip, the easier the cutting, and the less chip marking occurs.

There has always been considerable discussion as to whether plants should use a jointed or unjointed knife. The answer to this depends on the type of job that is to be done. As a general statement, most defects are at a minimum with a light joint, but with a heavier joint, the quality of planing decreases. It is the tendency of most operators to over-joint. As a result, a glossy finish is obtained. This is not to be construed as good planing because the dull, jointed knife has hammered and closed the wood cell fibres so that glue will not form a bond with the fibre of the wood. The glue acts as if it were placed on a mirrored surface. There is no bond, and the glue will not spread properly.

A board with a hammered, glossy finish, when set aside for a period of time, may begin to show raised grain. This is really a roughened condition of the surface of dressed lumber, in which the hard summer wood is raised above the softer spring wood, but not torn loose from it. This condition is brought about because the knives are over-jointed or dull. The knives pound the lumber down, pressing the hard summer wood into the softer spring wood. After the pressure of the knives is released, the hard summer wood raises above the pressed down softer wood. A keen cutting edge with a light joint will help overcome this condition.

If the lumber has been kiln dried too quickly, the holding power between the hard and soft grain is lessened, and raised grain may occur. Stratified woods, such as Cypress, are susceptible to raised grain.

If the operator uses jointed knives, the question arises whether to grind and then joint, or to grind to the joint. Many operators grind knives and then joint until a fine silver line shows on all four knives, telling them they have a true cutting circle. Others put a fairly heavy joint on the knives, and then grind until only a faint silver line is left on all four knives. The operator may find that one knife joints a little heavier than the others. This may show up on the lumber as a knife mark which is a little lighter than the other three knives in the cut. This, however, is of no consequence, as the knife marks are all the same height and distance apart. The light mark is caused by microscopic polishing of the wood.

A planed wood surface consists of microscopic waves, which are at right angles to the direction of the feed. It is commonly assumed that the more knife marks per inch, the better the planing. Actually, it is not the closeness of the marks, but the height of the waves which determines the quality of planing. This is judged by feel and sight.

The use of high cutterhead speeds obtained by V-belt drive or high frequency allows faster feed rates while still maintaining the same quality of planing.

Experience has taught the woodworking industry that 5-8% is the best moisture content range for most planing. Chipped grain, raised grain, and fuzzy grain increases in proportion with higher moisture content.

Generally speaking, the cutting angle can be reduced as the material increases in hardness and dryness. Woods that have long, tough fibres require a greater cutting angle than those with shorter, brittle fibres.

When the operator sees chip printing on the lumber, he can usually look to the blower system as the main source of his trouble. The pipe leading from the shaving hood to the main trunk line should not have any abrupt turns. Where the pipe connects to the trunk, there should be a "Y" fitting. This will allow the shavings to flow into the trunk much in the same manner as the flow of water into the city mains.