OPERATING INSTRUCTIONS

for

G & E

TOOL ROOM *and* INDUSTRIAL SHAPERS

GOULD & EBERHARDT

FOUNDED 1833

INCORPORATED

IRVINGTON 11, N.J., U.S.A.

• SETTING UP MACHINE •

GOULD & EBERHARDT shapers are shipped with all the finished surfaces coated with compound to prevent moisture and dirt from getting on the machine in transit. All surface compound should be removed with kerosene. DO NOT use naphtha or benzine. Clean ram ways, attach rear ram guard, and coat all finished surfaces with oil. If equipped with automatic tool lifter, clean actuating rail but do not oil rail or unit. The shoe must be kept dry to function.

LEVEL MACHINE

The shaper must be set level and secured to a concrete foundation or good solid wood floor. To level the shaper lengthwise and crosswise, place an accurate spirit level on the vise body or table.

First, level frame section of base with flat steel shims and bolt machine to floor at points B and C (See Fig 3).

Second, level extended portion of base as follows:

Remove table front support and attach an indicator to the table. Adjust indicator so that pointer contacts the finished plate on which the table support slides. Move table horizontally and note indicator reading which should be zero across full length of plate. If necessary, use tapered shims temporarily to obtain proper alignment of extended portion of base then insert flat shims and bolt at two front holes A.

CHECK DIRECTION OF ROTATION

The pulley shaft on the machine must revolve at the speed and in the direction specified on the plate attached to the frame. If the motor is improperly wired, or the belt improperly attached, the pulley will run in the wrong direction, lubrication system will not function, and machine may be damaged mechanically or thru lack of oil.

The feed selector handle should be positioned at **zero feed** until the correct rotating direction of the pulley is obtained.

ALIGN VISE

It is essential for accurate shaping that the vise be set square with the ram. The vise should be accurately aligned and squared by clamping a square against the solid jaw and indicating the blade with a dial indicator attached to the tool head.

Each shaper is given a thorough running test before shipping and is very carefully inspected for accurate operation. It is advisable, however, to run the machine at slow speed for several hours before using.

• LUBRICATION •

The sustained accurate service of which this machine is capable depends upon the proper lubrication and attention given to its bearings and the working parts. As far as practical, lubrication has been made automatic.

Each machine is equipped with a circulatory pressure oiling system which automatically supplies oil to all essential moving and rotating parts, including the crank pin block, ram guideways, crossrail, and the transmission gears. The oil is pumped from the main reservoir in the base through an oil filter and is distributed to the various outlets through several pressure lines (see Fig. 1). A cartridge type replaceable filter is provided. Change filter when needle of gage on operator's side enters red area. It is normal for this red condition to exist for some time after machine is started until the oil is warmed.

The main reservoir is in the base of the machine and is filled by removing door on side of the frame. Additional oil as needed may be added through the fill hole in the base. Always keep reservoir filled to "H" (High) level mark of dip stick on fill hole plug.

The oil reservoir in the base should be checked weekly and cleaned out about twice a year.

Sight oilers are provided at each of the four corners of the ram guideways in the frame to constantly lubricate the ram bearing. Allow motor to run until oil flows in all sight oilers before engaging the clutch control to operate the machine. If bubbles appear in transparent caps there is not sufficient oil in reservoir. A drop in pressure observed through the sight oilers indicates lack of oil in the base or sediment covering the filter cartridge. Add oil or replace filter as required.

CIRCULATORY PRESSURE LUBRICATION

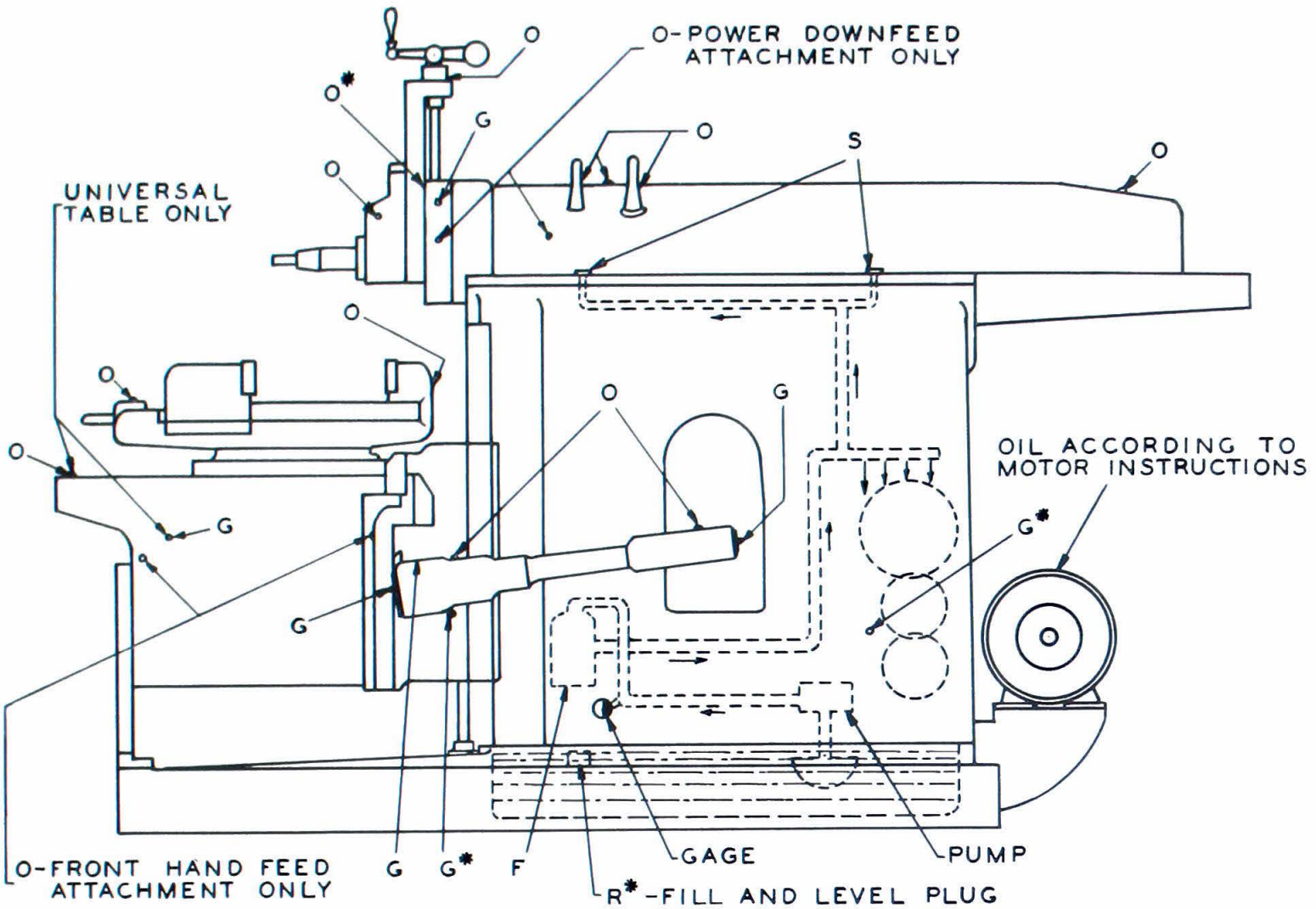

Figure 1

R—Reservoir. Check weekly. Use oil 450/600 S.S.U. viscosity at 100 F. Clean out twice a year.

O—Oil cups or grooves. Same oil as above.

G—Pressure fittings. Use soft grease of #2 consistency.

S—Sight oilers. To regulate loosen or tighten wick.

F—Filter.

*—See opposite side of machine.

Lubrication of the crossrail unit is accomplished by metering pins. The oil flow to these pins is regulated by a bleeder hole in the line located inside the frame. In the case of too little or too much oil being delivered to the crossrail unit due to oil temperature or viscosity conditions, the bleeder plug should not be altered or incorrect pressures may result. Gould and Eberhardt should be consulted about furnishing the necessary plug with correctly modified orifice.

The following approximate amounts of lubricating oil are required and should be put into the machine before starting. After the machine is started some of the oil will remain in the lines and it may be necessary to add oil.

Machine	Gallons
14" and 16" Tool Room Shapers	5
16", 16-20", 20" and 20-24" Industrial Shapers	7
24", 28", 32", 32" heavy and 36" Industrial Shapers	11

• OIL SPECIFICATIONS •

We recommend using a highly refined straight mineral oil of 450/600 seconds Saybolt Universal Viscosity at 100 deg. F., if scoring of the rams is to be avoided. It is particularly important not to use the ordinary grade of "machine" oil or red engine oil generally found in machine shops as this is usually from 200/400 seconds viscosity at 100 deg. F., is entirely too light, and not sufficiently refined. The following oils of reputable manufacturers are suggested, although other good oils of these specifications may be suitable.

Manufacturer	Trade Name of Oil	S.S.U.V. @ 100°F.
Atlantic Refining Co.	Eureka Oil H	500/515
Cities Service Oil Co.	Pacemaker #5	525/535
Colonial Beacon Oil Co.	Esstic 65	550/560
Gulf Oil Corporation	Gulf Seneca Oil D	500/510
E. F. Houghton & Co.	Cosmolubric #840	490/510
Imperial Oil Ltd. (Canada)	Imperial D.B. 61	500/525
Penola Inc.	Esstic 65	550/560
Pure Oil Co.	Klondyke Heavy	500/530
Shell Oil Co.	Shell Carnea Oil 41	500/549
Sinclair Refining Co.	Rubilene Medium Heavy	530/560
Socony-Mobil Oil Co.	Mobil DTE Oil Extra Hvy	590/600
Standard Oil Co. (Indiana)	Stanoil #50	500/515
Standard Oil Co.'s of Ky.; La.; N. J.; and Penna.	Esstic 65	550/560
Stuart Oil Co.	Sutraco L50	490/510
Sun Oil Co.	Solnus Heavy Medium	525/575
The Texas Co.	Texaco Texol E	500/520
Tidewater Associated Oil Co.	Tycol 119	510/530
Valvoline Oil Co.	Valvoline Product R506	500/510

• OPERATION •

BEFORE STARTING, BE SURE THE RAM WAYS ARE WIPED CLEAN AND ARE WELL OILED. A machine having a mechanical clutch is started by pulling the clutch control away from the machine and is stopped by pushing this lever toward the machine. To start ram on machine equipped with an electric clutch turn switch control to the left. Turning this switch to the right stops the ram.

ADJUST STROKE LENGTH

To adjust the length of stroke, stop the machine so that the zero mark on the stroke indicator is upward. Apply the crank handle to the stroke length control and turn clockwise to increase and counter-clockwise to decrease the length of stroke. A dial indicates the length of stroke.

POSITION RAM

The ram is positioned by first loosening the ram lock and then revolving the ram positioning control by means of the crank handle. This can be done while the machine is in motion. After making adjustment tighten ram lock.

If ram is positioned so that the tool head returns past the front of the frame, **be sure that head is not set too low or at an angle which would cause it to strike the frame.**

SET TOOL HEAD

The tool head is unclamped by applying the crank handle to the head lock and turning counter-clockwise. The tool head can then be swiveled and set to any desired position in 120 deg. Turn the handle clockwise to clamp and lock the head. A tool slide lock is provided to prevent the tool slide from creeping.

ADJUST RAPID TRAVERSE

Horizontal and vertical rapid traverse is always available whether the machine is running or idle, as long as the motor is operating. Traverse is engaged by pulling outward on the rapid traverse control. (See Fig. 2). Direction of traverse is determined by the position of the directional feed control and is indicated on an adjacent plate.

To traverse horizontally: Place the directional feed control in the direction desired (jogging the rapid traverse control handle to engage clutch teeth) and place the vertical movement control in its lower position (which is the standard position for feeding and traversing horizontally). Pull outward on the rapid traverse control to traverse.

THE DIRECTION OF HORIZONTAL RAPID TRAVERSE IS ALWAYS OPPOSITE TO THE DIRECTION OF THE FEED SET. Releasing the control disconnects the traverse and automatically reinstates the feed.

Always place directional feed control in neutral when positioning work table horizontally by hand to avoid damaging the feed mechanism. Overtravel past either end limit of horizontal rapid traverse or feed is prevented by a slip clutch. A loud sound produced by this clutch warns of reaching the limit.

To traverse vertically: First loosen table support clamp and remove the stress block. Then loosen the rail clamp (F) and revolve rail clamp (G) several revolutions counterclockwise. (Do not loosen the jam nuts because they are adjusted to hold the crossrail slideably to the frame.) Place the directional feed control in the vertical traverse direction desired (jogging the rapid traverse control handle to engage clutch teeth) and place the vertical movement control in its upper position. Pull outward on the rapid traverse control to traverse. Releasing the control disconnects the traverse mechanism.

The table is raised or lowered by rapid traverse to its approximate working position. This position should be as high as possible consistent with safety so as to minimize overhang of tool. Final adjustment of the tool in relation with the work is made by setting the tool head.

When table is in position place vertical movement control in its lower position, then secure rail with clamp (F) and rail clamp (G), reset table support and adjust stress block to lock the front of the table.

NOTE: Should rail be traversed so as to hit base or should an attempt be made to traverse rail while it is clamped, the mechanism is protected by a safety slip clutch. This clutch does not function as an upper limit of traverse and caution should be exercised in positioning the rail to prevent damage to ram or tool head.

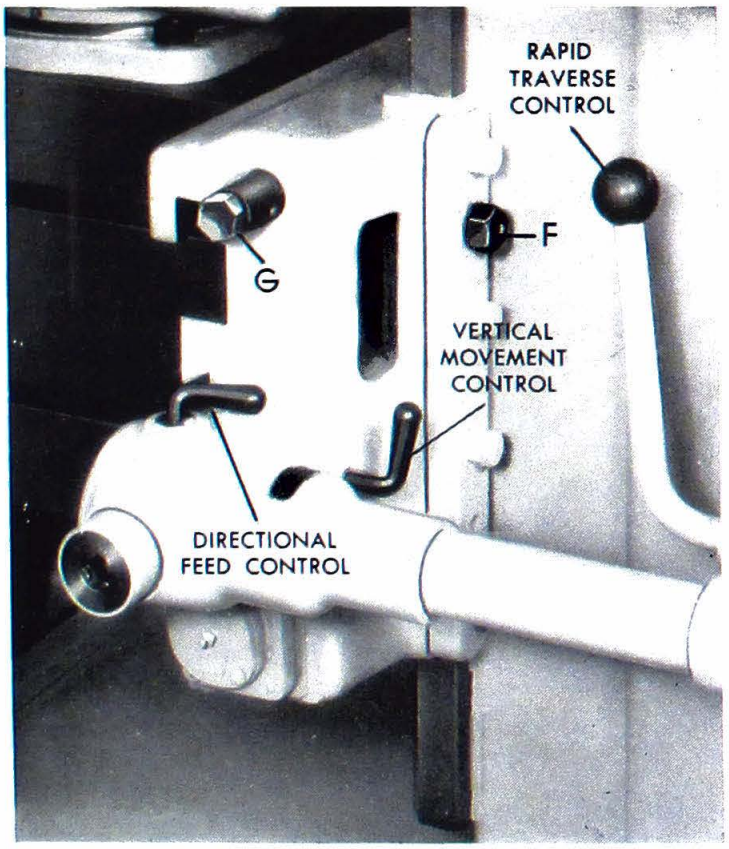

Figure 2

ADJUST FRONT SUPPORT

On machines equipped with a front support, always use both the support and the stress block. After clamping the front support, insert the stress block directly under the table on the inside of the front support. If the table is set at or near its lowest position, or if machine is equipped with a universal table, the stress block will not fit beneath the table and should be applied to the clamp outside of the support.

The vise may be swivelled by loosening the four clamping bolts of bottom plate. Tighten bolts securely before beginning to shape.

SELECT SPEED

Sixteen ram speeds are obtained by positioning the range and speed levers. Four speeds are available in each of the four range positions. Always check speed plate on machine for safe combination of speed and stroke length.

Always disengage clutch when shifting gears.

SELECT FEED

The feed selector controls the amount of feed. A plunger locks and indicates the feed selected. The feed may be changed whether the machine is running or idle. A feed direction control is provided at the crossrail. Setting this control away from the machine, feeds the table toward the operator. Setting the control in the opposite direction, feeds the table away from the operator. The feed is disengaged by setting the control in the midway position.

When cleaning chips off the vise and table, always brush away from and not toward the frame or on the ways, to prevent chips from getting inside the machine or scoring the ways. Do not use compressed air.

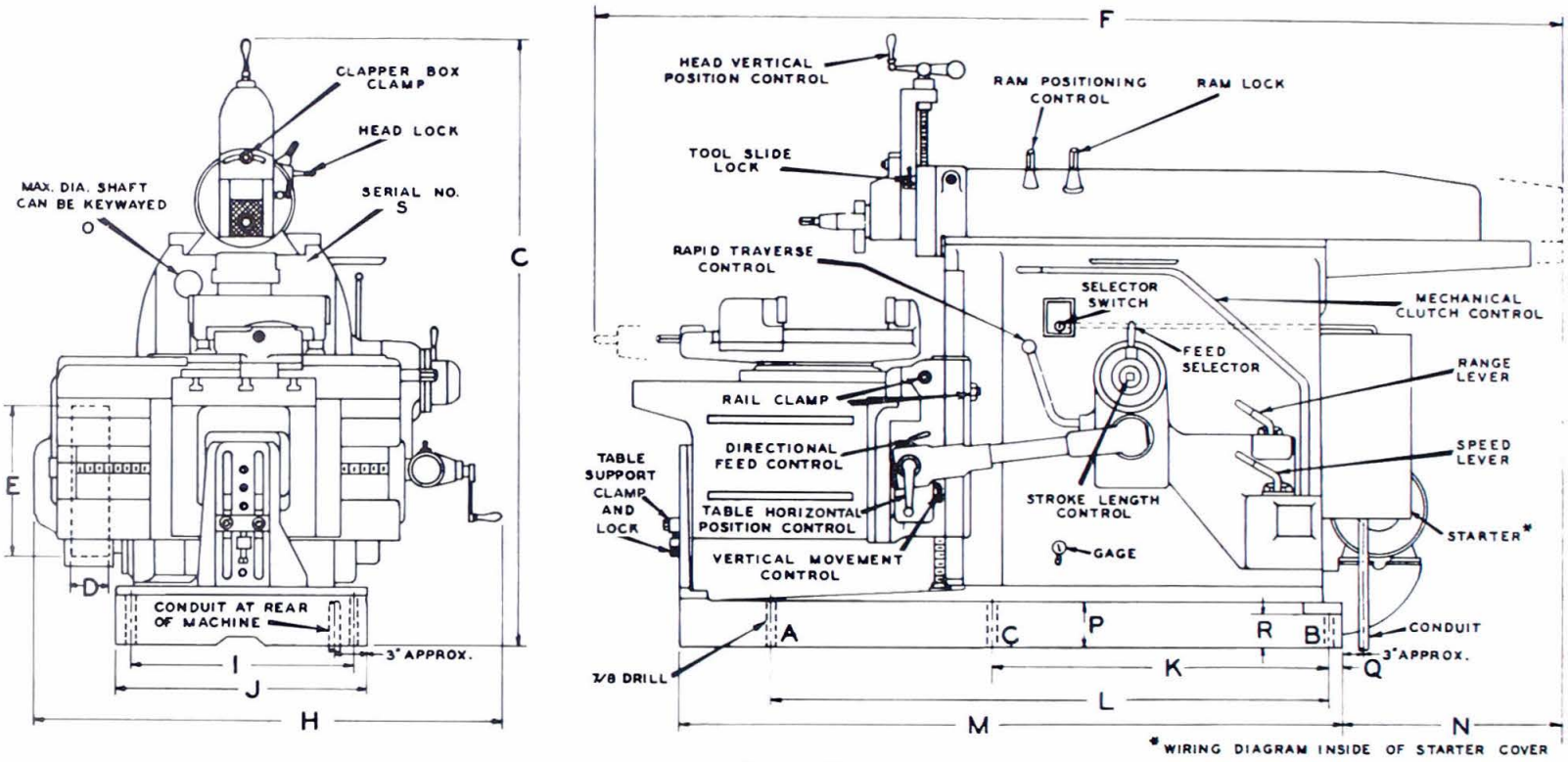

Figure 3

• TABLE OF DIMENSIONS •

Subject to change without notice

Size Machine	D	E	F	G	H	I*	J	K*	L*	M	N	O	P	Q	R
14" Plain T. R.	3 1/2"	12"	72"	57"	48"	18 1/2"	21"	29 1/4"	—	42"	15"	0"	3 3/4"	1 1/4"	2"
16" Plain T. R.	3 1/2"	12"	73"	57"	48"	18 1/2"	21"	29 1/4"	—	42"	16"	0"	3 3/4"	1 1/4"	2"
16" T. R.	3 1/2"	12"	73"	57"	48"	18 1/2"	21"	29 1/4"	45 3/4"	51 1/2"	16"	0"	3 3/4"	1 1/4"	2"
16" Ind.	4"	14"	83 1/2"	60"	48"	21 1/2"	24"	32"	53 1/4"	59"	19"	2 1/2"	4 3/4"	1 1/4"	3 1/2"
16-20" Ind.	4"	14"	85 1/2"	60"	48"	21 1/2"	24"	32"	53 1/4"	59"	21"	2 1/2"	4 3/4"	1 1/4"	3 1/2"
20" Ind.	4"	14"	93"	61"	48"	21 1/2"	24"	32"	55 3/4"	61 1/2"	26"	2 1/2"	4 3/4"	1 1/4"	3 1/2"
20-24" Ind.	4"	14"	95 1/2"	61"	48"	21 1/2"	24"	32"	55 3/4"	61 1/2"	28"	2 1/2"	4 3/4"	1 1/4"	3 1/2"
24" Ind.	5"	16"	105"	68"	56"	25"	28"	38 3/4"	68 1/4"	75"	26 1/2"	3"	5"	1 1/2"	3 1/2"
28" Ind.	5"	16"	108 1/2"	68"	56"	25"	28"	38 3/4"	68 1/4"	75"	28 1/2"	3"	5"	1 1/2"	3 1/2"
32" Ind.	5"	16"	121"	68"	56"	25"	28"	38 3/4"	68 1/4"	75"	37"	3"	5"	1 1/2"	3 1/2"
32" Hvy. Ind.	5"	16"	122 1/2"	73"	56"	31"	34"	44"	75 1/2"	85"	35"	3"	6"	1 1/2"	3 1/2"
36" Ind.	5"	16"	134 1/2"	73"	56"	31"	34"	44"	75 1/2"	85"	43"	3"	6"	1 1/2"	3 1/2"

*If hold down bolts are to be permanently located before machine is received, it is necessary to obtain certification of dimensions I, K and L.

• POWER DOWNFEED TO TOOL HEAD •

After the stroke length and the ram position have been set and the tool slide lock (E) is released, the power downfeed can be set. (See Fig. 4).

Loosen hand screw (B) and position cam (A) so that when the ram is at the end of the return stroke, lever (C) will have traveled not more than one or two inches on the horizontal portion of the cam. Then tighten (B). Feeding occurs on the return stroke as lever (C) rides on cam (A).

To prevent damaging downfeed mechanism, cam (A) is provided with a safety lobe which locks lever (C) horizontally when cam is located too far forward allowing lever to pass beyond the cam. To reset lever (C), pull out pin (D) which will permit returning lever to vertical position. Then reposition cam so that lever does not travel more than an inch or two on the horizontal portion.

The feed selector controls the amount of downfeed. A plunger locks and indicates the feed selected. The feed should be changed while the machine is idle. For manual operation of tool slide, pull out knob (F) and turn knob 90 degrees.

Always move the cam (A) to its extreme

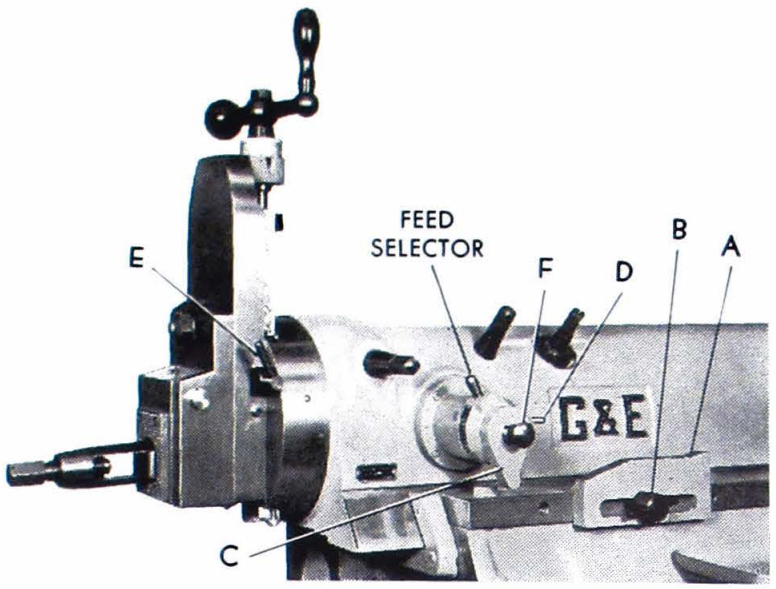

Figure 4

rear position on frame when not in use, when changing the stroke length, or positioning ram.

An automatic stop is provided on the tool head screw and is set by loosening the lock screw in the stop, revolving the stop to desired position on screw, and retightening lock screw. This stop operates in conjunction with a slip clutch, thereby providing a positive stop for any predetermined depth of cut. This clutch also indicates the low limit of vertical feed travel.

• ADJUSTMENTS •

RAM

Alignment of ram is uniformly maintained throughout the entire length of guideway by a single adjustable gib. Wear on the ram guideways is taken up by first slightly loosening the clamping bolts that hold down the left wedge (viewing front of machine) then adjusting the screws along the side of the frame. It is essential that this adjustment be carefully made to have the ram snug but not so tight as to bind and score.

Adjustment of the ram lock is provided at the ram lock post. To increase locking effect, remove retaining ring and washer, lift up blackened ring and rotate ring one spline tooth in a counter-clockwise direction, and reassemble washer and retaining ring.

TOOL HEAD

A taper wedge is provided to compensate for wear on the guideways of the tool head. This wedge is located on the operator's side of the head and can be adjusted by loosening the top screw and tightening the lower screw.

SLIDE

The adjustment of the table slide upper guide to the crossrail is made by removing the strap running across the top of the rail and peeling off a lamination from the center and/or end sections of the shim. Localized wear may be compensated for by this means.

To adjust the lower guide to the crossrail, traverse table slide to the extreme left position, loosen the lock screw at the back of the slide, and turn the adjusting screw at the end of the wedge.

MECHANICAL CLUTCH

On machines equipped with a mechanical clutch, adjustment means are available to compensate for wear of the clutch plate. By withdrawing the plunger provided, the toggle unit can be turned in a clockwise direction until the plunger drops into the next hole,

which increases the plate pressure. It may be necessary to advance the plunger several holes to obtain the proper pressure between the plates when the clutch is engaged. Excessive plate pressure will make control difficult to engage and clutch will drag.

If ram creeps or will not stop with clutch control in stopped position, dirty clutch plates are indicated. Disassemble clutch, clean plates with carbon-tetrachloride and wire brush and reassemble, adjusting as above if necessary.

ELECTRIC CLUTCH

When machines are equipped with an electric clutch and brake, a rheostat is provided to control the braking action for stopping the ram. The rheostat is positioned at the factory. If faster brake action is desired turn rheostat slowly toward a higher setting until the ram stops within the limits desired.

V-BELTS

On motor driven shapers, the motor is attached to a bracket on the rear of the machine. Screws in the bracket permit lining up the motor and adjusting tension of the V belts.

UNIVERSAL SHAPERS

The preceding instructions apply to Universal Shapers equipped with swiveling tables having tilting work surfaces.

To swivel the table, first loosen table front support clamp, stress block, and the four swiveling table clamping nuts. Apply crank handle to swivel control, and after positioning table to desired angular setting, tighten table clamping nuts. Reset table support and adjust stress block.

To tilt table top, loosen four tilting-surface clamping nuts and apply crank handle to tilting control. Set top at angle desired and tighten tilting surface clamping nuts.

If a tapered cut should occur, check and relevel machine as per instructions "Level Machine."

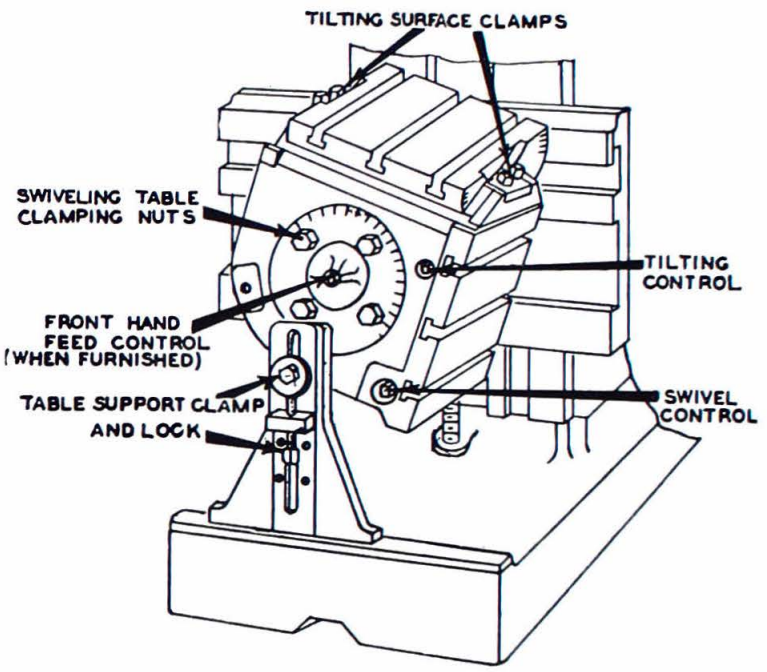

Figure 5

SERIAL NUMBER AND REPAIR PARTS

The machine serial number is stamped on the frame in the front upper right-hand corner, directly below the ram guideway. (See Fig. 3). When referring to your shaper, always mention this serial number.

When ordering repair parts, please refer to Parts List Bulletin for instructions. It is important that the serial number be indicated to assist us in filling your order correctly.

G & E

• PRODUCTS •

METAL SHAPING MACHINES
SPUR AND HELICAL GEAR HOBBING MACHINES
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CONE WORM GEAR HOBBING MACHINES
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