HOW TO OIL THE SHAPER

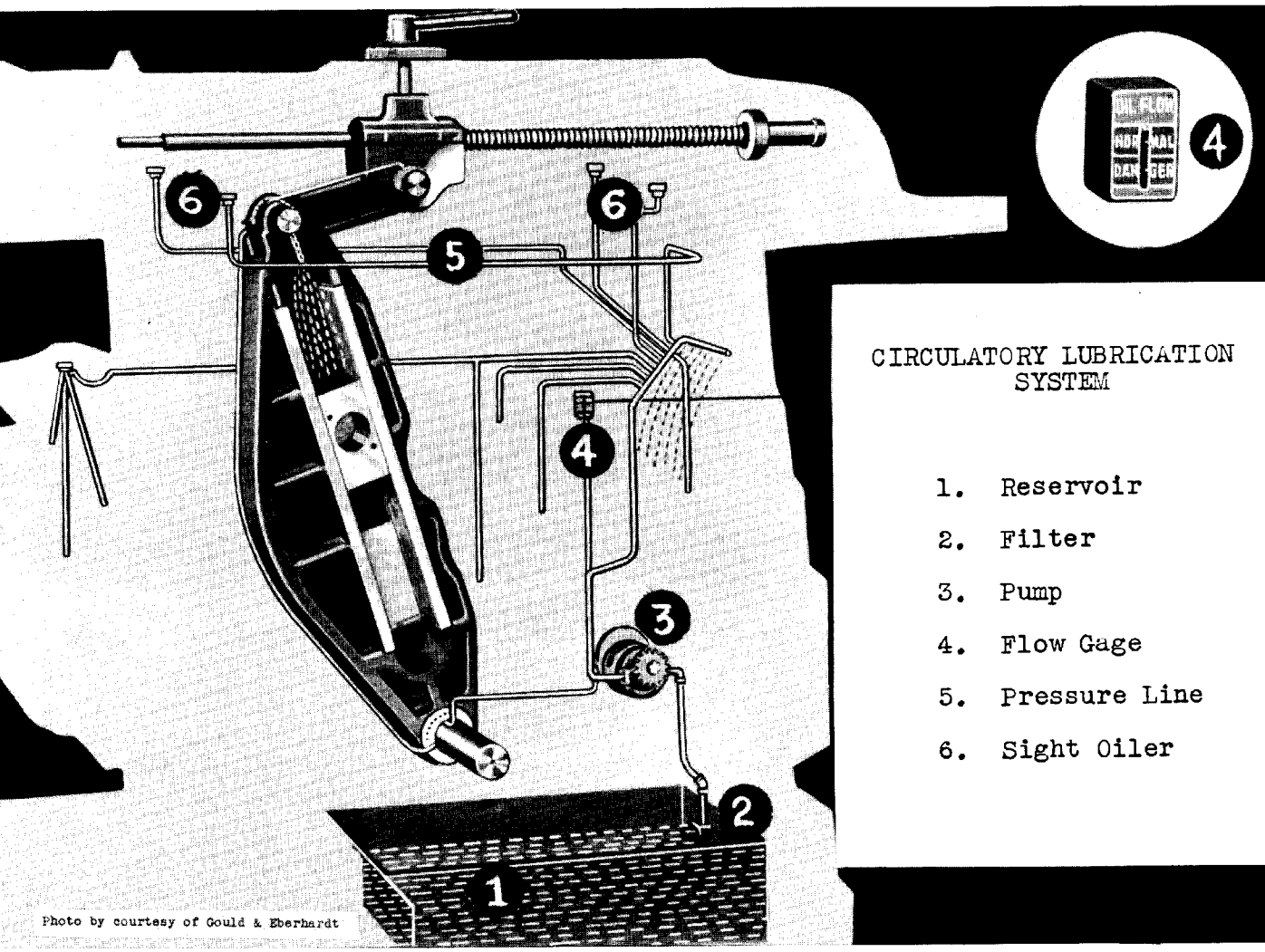

Photo by courtesy of Gould & Eberhardt

CIRCULATORY LUBRICATION SYSTEM

1. Reservoir
2. Filter
3. Pump
4. Flow Gage
5. Pressure Line
6. Sight Oiler

UNIT P 52 (A)

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HOW TO OIL THE SHAPER

OBJECTIVES OF UNIT

1. To point out the reasons for oiling a shaper.
2. To show how and when to oil a shaper.
3. To explain how to maintain a circulating oiling system.

INTRODUCTORY INFORMATION

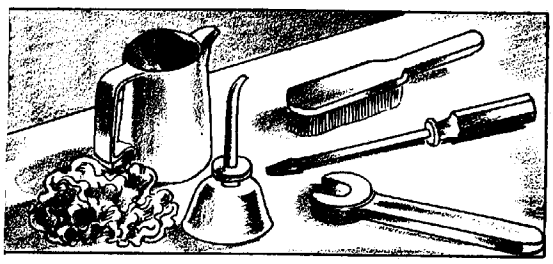
The manufacturer of machine tool equipment goes to considerable length to design and build smooth and nearly frictionless surfaces on all working parts of the shaper. The parts are fitted together with such exactness that they will function smoothly and make possible the production of accurate work when the shaper is operated in a skillful manner.

Smooth surfaces which move over one another will not remain in this condition very long if they are not separated with a film of lubricating oil. Neither will the ease of movement between surfaces be continued in the absence of lubrication. Instead the surfaces will wear rapidly and become scored, and the effort required to operate the shaper will be increased considerably.

Therefore, it is necessary to keep a film of oil constantly on both flat and round bearing surfaces. To accomplish this, various methods have been used. Some of these are entirely manual; others are partially manual and partially automatic.

Regular care and attention must be given whichever method is used. The presence of an oiler alone is no assurance that the bearing to which it leads will receive oil. It may be empty or clogged, and either of these conditions alone will result in a dry bearing.

To lubricate a machine properly, the operator must be aware that every revolving shaft has a bearing which must receive oil, and that flat surfaces moving over one another must be lubricated also. When starting work on a shaper, the operator should locate all the bearing surfaces. If the bearings are hand oiled, he must determine the location of the oil holes for these bearings and make certain that they are kept well oiled at all times. If they are automatically oiled, continuous circulation of oil must be maintained. The entire circulatory oil



system must receive regular attention to assure its functioning in an efficient manner.

Pressure and hand oiling systems are seldom used exclusively for all parts of the shaper. They are frequently supplemented by cascade oiling of the transmission gears and splash oiling of some parts within the column.

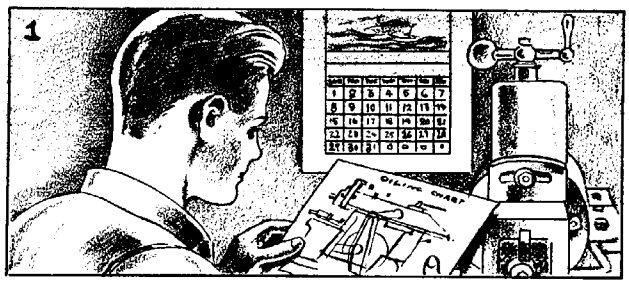
TOOLS AND EQUIPMENT

Shaper	Wiping Cloth	Brush
Oil Cans	Screw Driver	Wrenches

PROCEDURE

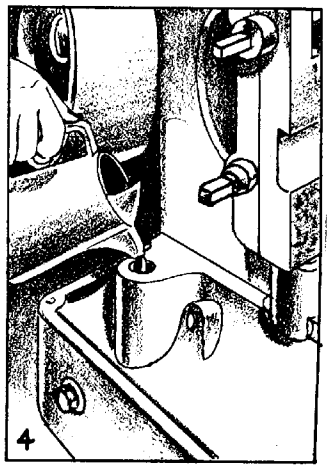
1. Follow the specific directions given on the lubrication chart supplied by the shaper manufacturer, if it is available. This will assure each bearing surface the regular application of the correct quantity and quality of lubricant.

2. Follow the directions given hereafter if a lubrication chart is not available, so that the shaper will be lubricated with equal assurance, regardless of the method (manual or automatic) used to lubricate the machine.



3. Determine oiling procedures to follow on those types of construction which have neither been included on the manufacturer's chart or in the procedures below, on the basis of information previously covered and the statements which follow.

   NOTE: Although relieved of some of his oiling duties when the shaper has an automatic oiling system, the operator's duties do not diminish. He assumes responsibilities for the maintenance of the system.



4. Give the circulatory oiling system the following routine daily checkup.

   a. Check the oil level in the reservoir by the sight gage. If a gage has not been used, check the level by removing the fill and level plug in the reservoir.

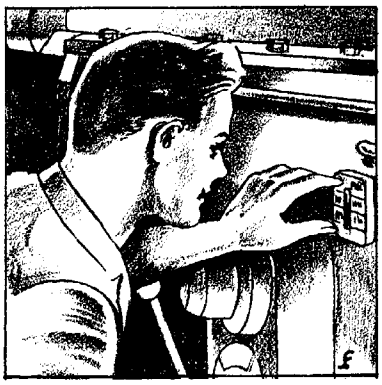
b. Clean the area around the plug before removing in order to prevent the entrance of foreign material to the reservoir.

c. Add, if needed, enough clean oil of a viscosity recommended by the manufacturer to maintain the proper oil level in the reservoir according to the line on the sight-gage glass. If the gage has been omitted from the system, fill the reservoir to the bottom of the plug.

d. Tighten the plug securely to avoid oil leakage. Immediately wipe up oil spilled on the machine to prevent its flowing onto the floor or collecting dust.

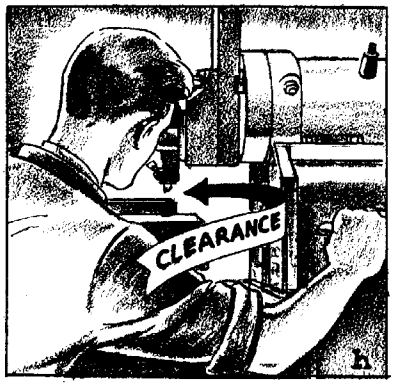
e. Check the operation of the pump and the circulation of oil by starting the main drive motor with the starting clutch disengaged.

NOTE: Because of differences in construction, it may be necessary on some shapers to engage the clutch in order to set the pump in operation. With this type construction, the speed-change lever should be in neutral so the ram will not be set in motion.



f. Allow the motor to run while checking the flow of oil through the flow gage and in every sight oiler on the machine.

g. Stop the motor if for any reason oil is not visible in the flow gage or the sight oilers, and report this condition immediately.



h. Start the machine, only after it has been set for a slow ram speed and the ram has been checked to see that the tool will clear (not strike) the work in the machine. This is done for the purpose of distributing oil uniformly over the working surfaces before beginning actual machining operations.

CAUTION If this is the operator's first experience with the shaper, or if he is doubtful of the speed and ram setting, he should seek assistance before setting the machine in motion.

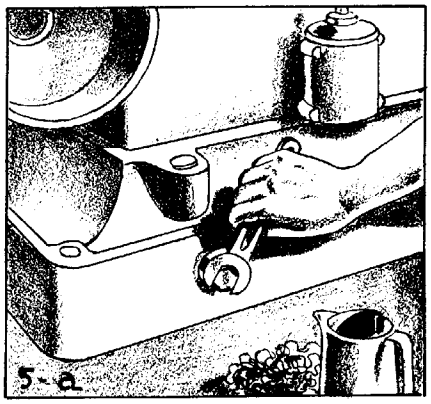
i. Keep the faces of gages and oilers clean and in good repair. Replace those which become damaged.

5. Follow the directions given below for changing the oil in a circulatory system.

NOTE: The lubricating oil must be changed oftener than indicated below if the shaper operates in surroundings which are unusually dusty, or if the shaper is used for very severe machining operations.

a. Drain the oil from the reservoir at least twice yearly and more frequently if discoloration or thinning out makes this advisable.

b. Examine the condition of the filter (if one has been used) and clean it if necessary.

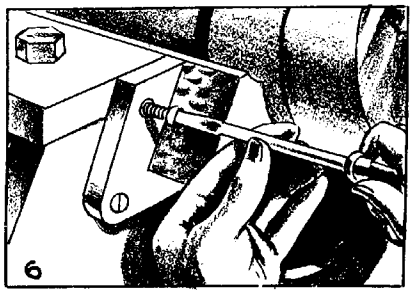


NOTE: It is a good practice to service the filter whenever the oil in the reservoir has been changed. This may require nothing more than turning a handle to clean the filter plates. In other types it may require the replacement of a felt pad which has become loaded with foreign materials removed from the oil. Although the use of a filter may extend the interval between oil changes, it will not eliminate the need for changes altogether. Discoloration from dirt, and thinning out from extended use, still make periodic changes a requirement of good lubrication.

c. Remove all sediment which has been removed from the oil and has accumulated in the reservoir. Then, flush the reservoir with kerosene.

d. Securely close the opening used for draining the reservoir so that oil can not leak from this opening.

e. Fill the reservoir to the proper level with clean oil of the viscosity recommended by the shaper manufacturer. S.A.E. 30 refers to a medium grade of oil.



6. Examine occasionally the felt wipers used on the machine. If they have become loaded with dirt and metal particles, wash them in gasoline and allow to dry thoroughly before replacing.

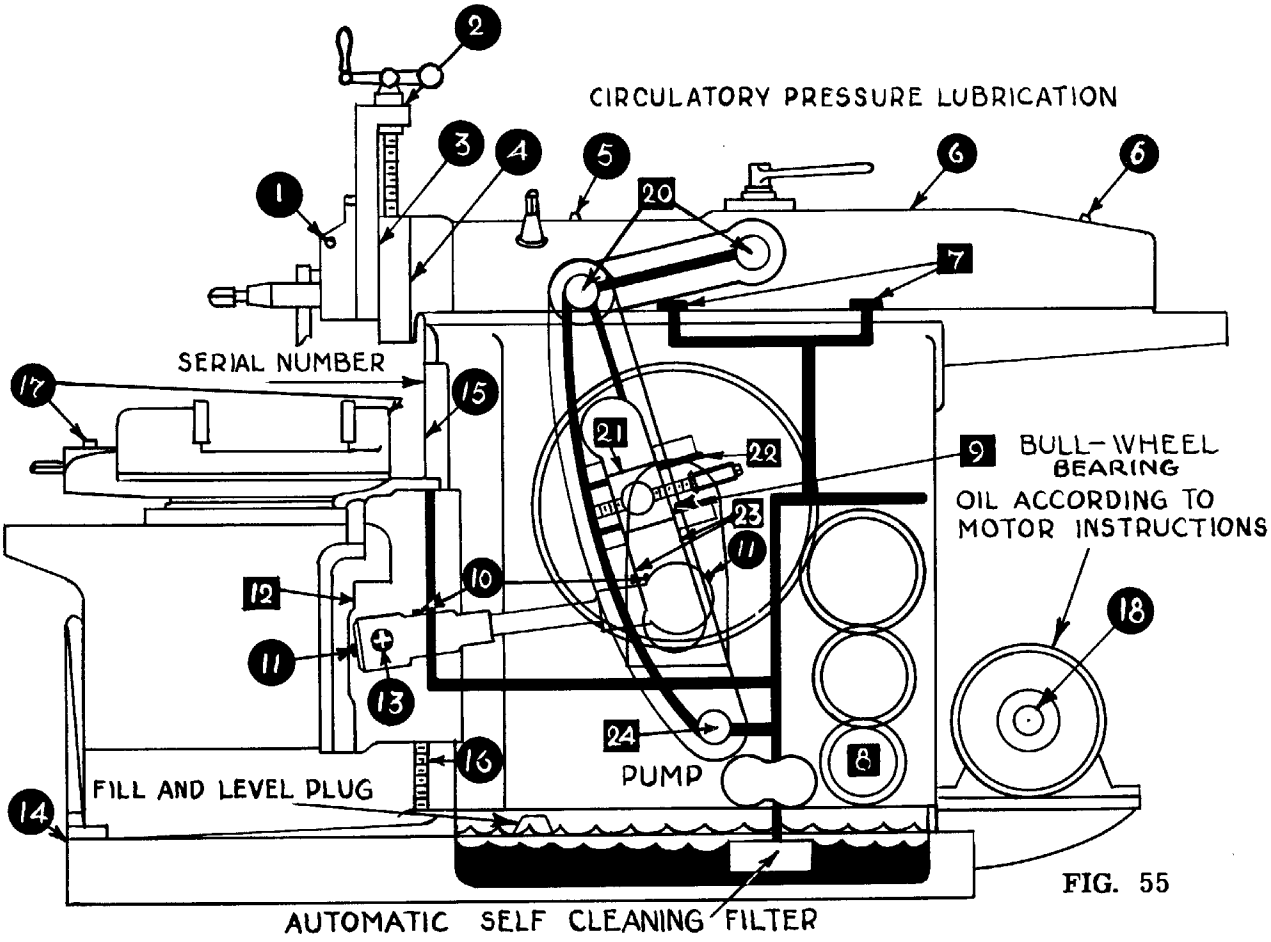


FIG. 55

NOTE: All places on a shaper which must be lubricated in one way or another have been located and numbered on the oiling chart shown above. In addition, corresponding numbers precede the directions for oiling these places. The numbers for those places which are usually oiled automatically are enclosed in a square instead of a circle.

CAUTION Do not oil any part of the shaper while it is in motion. As an extra precaution against accidents, do not have the main drive motor in operation.

1. Apply a drop or two of oil to the oil hole leading to the hinge pin and to the sides of the tool block which it supports.

2. Oil the down-feed screw and the bearing in the top of the tool slide in which it turns.

3. Raise the tool slide and wipe its dovetailed surfaces clean. Then apply a small amount of oil and distribute it evenly over the surfaces with the fingers.

4. Apply a small quantity of oil to the back face of the swivel block when it becomes necessary to change its position.

5. Lubricate the front bearing of the ram-adjusting screw.

6. Oil the ram-adjusting screw (through the slot) and its rear bearing.

7. Oil the guide ways on both sides of the ram. If felt wipers have not been provided for this purpose, first wipe the guides with a clean cloth.

8. Lubricate the main drive-shaft bearings on both sides of the column.

9. Fill the oiler for the bull-wheel bearing. Since this is a large bearing, it is frequently equipped with a sight oiler which provides metered lubrication.

10. Oil the bearings on both ends of the feed shaft.

11. Supply a small amount of soft grease to the feed reverse gears within the front end of the gear case, and to the feed mechanism in the rear case.

12. Wipe the top, front, and bottom surfaces on one end of the cross rail. Apply oil to the cross rail and distribute it with the fingers. Then turn the handcrank to move the saddle to the end just oiled and repeat the cleaning and the oiling for the other end of the cross rail.

13. Lubricate the threads on the cross-feed screw and its bearing in each end of the cross rail in which it turns.

14. Wipe chips and dirt from the surface on which the table support slides. Then apply oil to this surface.

15. Thoroughly clean the vertical bearing surfaces on the column. Then apply a small amount of oil and spread it uniformly with the fingers before raising or lowering the cross rail.

16. Clean and oil the elevating screw. If the elevating screw rotates in a bearing in the base of the machine, apply a few drops here too.

17. Apply a few drops of oil to the front and rear vise-screw bearings and to the vise screws.

18. Maintain the oil at the correct level in the wells which supply oil to the sleeve-type motor bearings, or inject a small amount of soft grease less often if the bearings are of the ball or roller type.

19. Oil the places where the gear shift and clutch levers emerge from the transmission and column. (These places are not shown in Fig. 55.)

CAUTION The following parts are within the column and may be oiled only through an opening in the left side of the column. A door or a removable hand-hole cover is usually provided for this opening. Although it is necessary to have the machine shut off during oiling, it is imperative now that not only the machine but also the motor be shut off if accidents are to be prevented. In a shaper with a circulating system, these parts would be automatically oiled.

20. Oil the pins in the links which connect the rocker arm with the nut on the ram-adjusting screw.

21. Saturate with oil the felt pad which is usually placed in the pocket of the slide block. The purpose of the felt pad is to keep the crank pin lubricated.

22. Place a few drops of oil on the parts which comprise the stroke-adjusting assembly: the screw, gears, and slide on the bull-wheel.

23. Spread oil uniformly over the slide-block bearing surfaces in the rocker-arm slot.

24. Oil the rocker-arm shaft on which the arm pivots.

CAUTION Replace the hand-hole cover for the opening to the column as soon as the oiling within has been completed.

SAFETY PRECAUTIONS FOR OILING THE SHAPER

- Do not oil the shaper when it is in operation.
- Do not fool around the machine while it is being oiled.
- Avoid leaning against the machine; it may result in accidental starting.
- Wipe all excess oil from surfaces near oiling places on the machine and wipe up any oil spilled on the floor.
- Remove oily waste to a covered receptacle to eliminate a fire hazard.
- Use an oil can with a bent spout and place it where it can cause no personal injury.