I N S T R U C T I O N S

for the

INSTALLATION, LUBRICATION, SET UP

OPERATION and MAINTENANCE

of

B A R D O N S & O L I V E R

NO. 32

AUTOMATIC CUT-OFF MACHINE

B A R D O N S & O L I V E R, I N C.
1133 W. 9th.St., CLEVELAND, 13, OHIO, U.S.A.

GENERAL

This machine has been designed to chamfer and cut off pipe or tubing in lengths up to approximately 12" automatically. The maximum number of pieces that can be cut off per minute depends not only on the diameter, but also on the length required. Maximum production can be expected only on lengths up to about 6". To cut off longer pieces, from 6" to 12", a longer time cycle is required to provide more feed out time. This may be provided for either by decreasing the feed, or by reducing the spindle speed.

Pieces longer than 12" may be cut off semi-automatically by single cycle operation. For cutting off pieces over 30" long, a special stock stop bar is required.

CAUTION: Be sure to read completely and thoroughly this booklet before attempting to operate the new machine. When leaving our factory, machine has been set up and tested and is ready to produce one of the customer's specific parts. Sample of part for which this machine was set up when shipped is tagged and wired to front toolholder.

PRODUCTION OUTPUT CHART

SIZE	LENGTH	RPM	FINE FEED	MED FEED	COARSE FEED
3/8 Pipe	To 6"	1870	58	72	88
	6" to 12"	1460	46	56	69
1/2 Pipe	To 6"	1460	46	56	69
	6" to 12"	1140	36	44	54
3/4 Pipe	To 6"	1140	36	44	54
	6" to 12"	950	29	36	45
1 Pipe	To 6"	950	29	36	45
	6" to 12"	735	23	28	35
1-1/4 Pipe	To 6"	735	23	28	35
	6" to 12"	572	18	22	27
1-1/2 Pipe	To 6"	572	18	22	27
	6" to 12"	572	18	22	27

The above chart shows the approximate number of steel pipe nipple blanks, in sizes from 3/8" to 1-1/2" pipe, produced per minute, in various lengths, by using each of the three quick feed changes provided. Quantities listed are based on perfect performance for 100% of a minute, with no allowance made for such factors as set up, tool sharpening, loading the pipe, and fatigue.

Parts made from tubing of lesser wall thickness than standard pipe can be produced at somewhat higher rates. For example, 7/8" x 18 ga. (.048 wall) up to about 6" long can be produced at rates of better than 70 pieces per minute.

INSTALLATION

1. Place machine close as possible to final location, before removing skids.

2. Thoroughly remove all rust preventative from finished surfaces.

3. Level the bed accurately, placing spirit level across both bed ways at 90°, first at one end of bed and then at other end.

4. Bolt all four legs solidly to the floor in order to maintain bed level and also alignment with stock supports. (Use of four 3/4" x 4-3/4" x 7-1/4" steel plates under each leg and six 3/4" x 6" x 9" plates under stock supports is advisable.)

5. Connect terminals in the magnetic starter, through a disconnect switch, to main power lines carrying same voltages as indicated on motor. If motor shaft does not rotate in direction indicated by arrow on top of motor end bell, then reverse the main power lines to magnetic starter.

6. Connect air line of at least 3/4" to coupling located directly below air gage unit.

7. Lubricate completely according to lubrication instructions and at least once every four hours of continuous operation.

LUBRICATION

Alemite Grease Fittings are located as follows, and should be greased at least once every four hours of continuous operation:

- Coolant Pump
- Roller Feed Unit (6)
- Automatic Chuck Wedge
- Yoke Stud
- Cut Off Slide Saddle (4)
- Chamfering Slide (2)
- Chamfering Slide Cam Lever
- Roller Cutter Holder Base
- Carriage Apron (10)
- Stock Stop Bracket

Oil must be maintained at gage level and should be drained and replaced with fresh oil after every 300 operating hours, in following locations:

- Headstock (Cuno Oil Filter is located behind Cam Lever - turn handle at least once each shift.)
- Head End Gear Train Bracket
- Air Gage Unit

Sight Feed Oiler is located on side of Carriage Apron (keep filled.) Three Oil Cups on Air Valve & Stock Stop should be filled daily.

OPERATION

After bolting down, wiring, attaching air line, and lubricating, machine should be run through its idle cycle (without feeding any stock into the chuck) until becoming familiar with its functions. To do so, first turn on the air, then start the spindle by means of recessed pushbutton on headstock. Next engage the feed by raising feed lever "A" (Fig. 1) until it latches. Machine is now in idle cycle. To stop machine, disengage feed lever when cut off slide has just receded and then shut off motor.

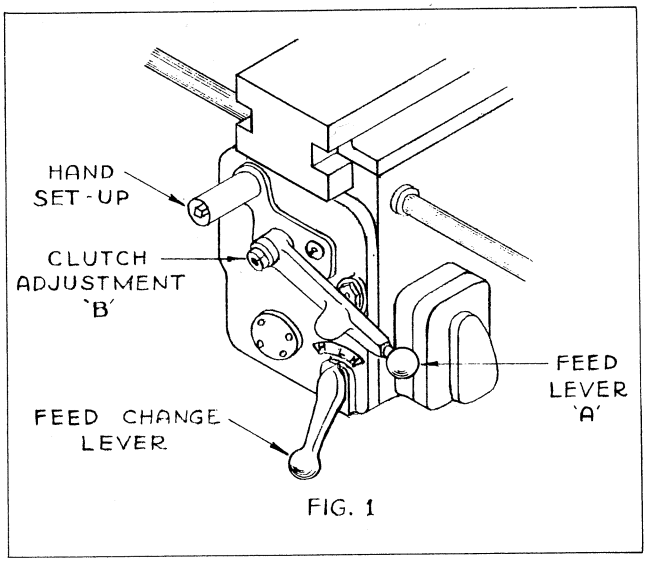

FIG. 1

After the operating principles have been given thorough study, production should be started first only on the part which this machine was set up for when it left the factory. (See sample part wired to front tool holder.) After disengaging feed lever "A" and stopping spindle, move lever "B" (Fig. 2) toward the rear to open the feed rollers and then insert a length of stock of same diameter and wall thickness as sample through rear end of the spindle, and return lever "B" to original position. Start spindle again and also roller feed motor. Direct coolant on work; then engage feed lever. Machine should now produce finished pieces automatically.

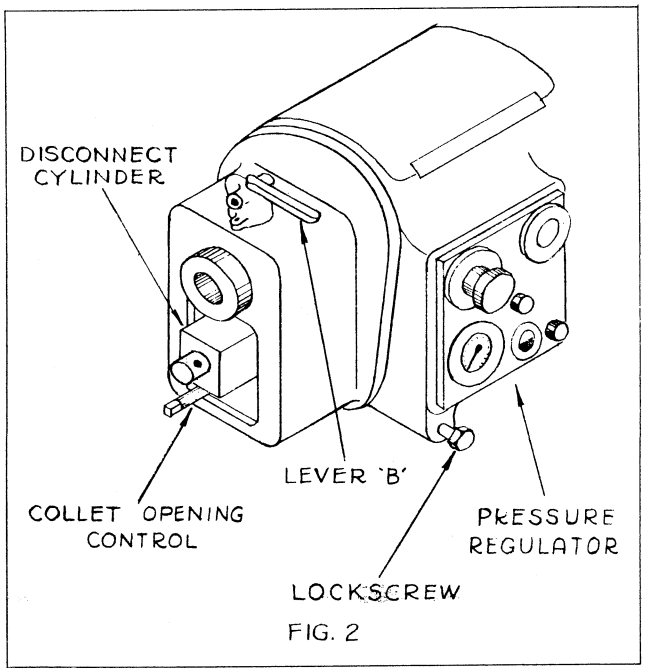

FIG. 2

SET UP - GENERAL

Care must be taken in setting up in order to obtain peak production and maximum roller and chamfering cutter life.

Satisfactory performance can be obtained only by most careful attention to the following:

1. Avoid excessive clearance when collet is in open position.

2. Position the Automatic Collet Chuck Wedge to compensate for some variation in diameter of stock, both plus and minus.

3. Locate the Stock Stop and Stock Stop Cams properly in relation to the diameters and lengths to be cut, so that the butt ends may pass out freely.

4. Radial Setting of Chamfering Tool Slide Cam must assure complete closing of collet before Chamfering Cutter touches the work.

5. Adjust Feed Rollers according to the diameter and weight of the material to be cut.

If trouble develops, it can generally be traced by a detailed check of above essentials.

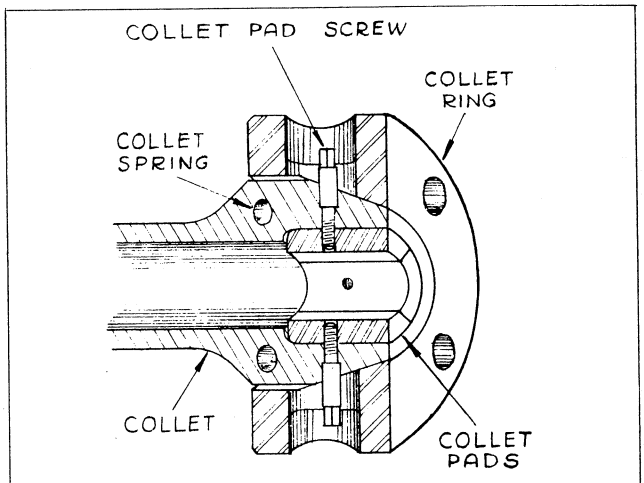

FIG. 3

DETAILS OF SET UP

To Change Collet Pads, it is necessary to remove collet hood guard and then loosen collet pad screws (Fig. 3) using the socket tee wrench provided. Before replacing collet pads, inner plunger should be changed if necessary. Best results are obtained only by using a separate plunger for each diameter of stock to be cut. When replacing collet pads, be sure that the screws are set up tight.

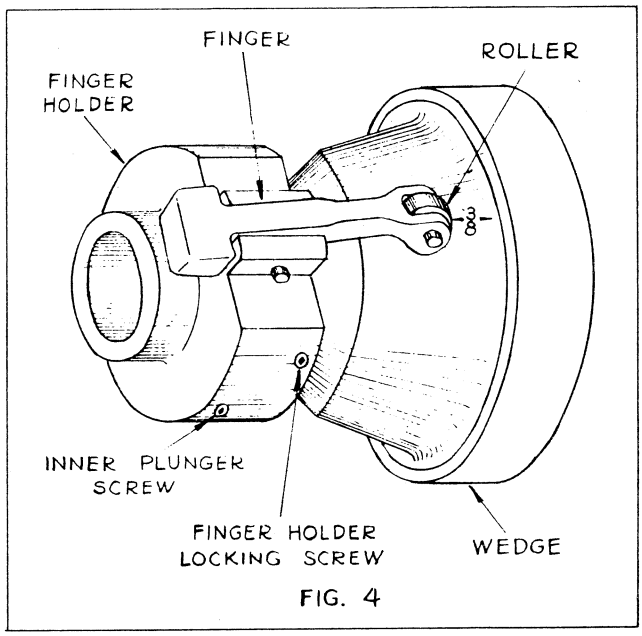

FIG. 4

To Change Spindle Inner Plunger, remove collet pads, loosen the two inner plunger screws, loosen and swing the stock stop arm back or remove if necessary, and push the plunger out through front end of spindle.

To Adjust Collet Chuck, first set the air regulator on machine to provide a minimum of 100 lbs. and a maximum of 120 lbs. (Note: if pressure at machine falls below 100 lbs., the work may slip in the collet and damage the cutters.) Insert pipe or tubing through collet, loosen fingerholder locking screws (Fig. 4) and turn fingerholder clockwise on spindle to increase collet grip. When collet is closed, the finger rollers should be about 3/8" away from shoulder to allow for variation in the diameter of the work.

Be sure that fingerholder locking screw is tightened before starting machine. (Note: do not force this screw since distortion of the spindle will cause collet mechanism to bind.)

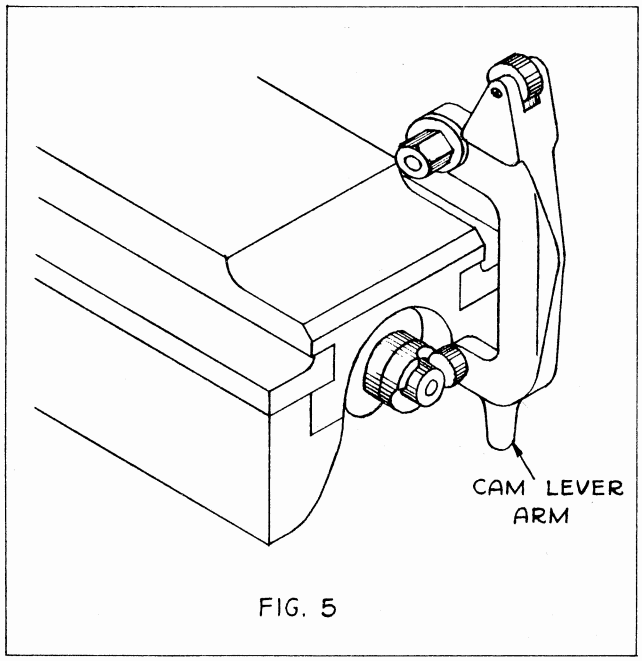

FIG. 5

Changing and Setting of Feed Cams. The two feed cams, one for each tool slide, are located on the end of the cam shaft under the rear end of the cut off tool slide (Fig. 5). In order to change the cut off slide cam it is first necessary to remove the chamfering slide cam, held in place by a retaining screw and washer. By pulling the cam lever arm (Fig. 5) all the way out and then inserting the chained pin into the hole in the chamfering bracket to hold the chamfering slide out of the way, the chamfering cam can easily be removed. Then slide the cam setting handle (Fig. 6) over the end of the 1-1/4" shaft and lock in a vertical position. Now working this handle back toward the rear will release the cut off slide cam for removal. (Fig. 7) After replacing cams, be sure to remove cam setting handle and withdraw stop pin from chamfering slide before starting machine.

The chamfering slide cam fits on a multiple splined shaft to provide for radial adjustment. When replacing this cam, the cut off slide should have just reached its fully receded position and the reference line on the face of the cam hub should be set at the top and vertical (Fig. 7). Clockwise adjustment of the cam causes the chamfering tool to start cutting earlier in relation to the cut off tool. Set cam so collet is fully closed before the tool touches the stock. Final adjustment can be made after test running the machine. Note: The chamfering tool should be set to start cutting ahead of the roller cutter.

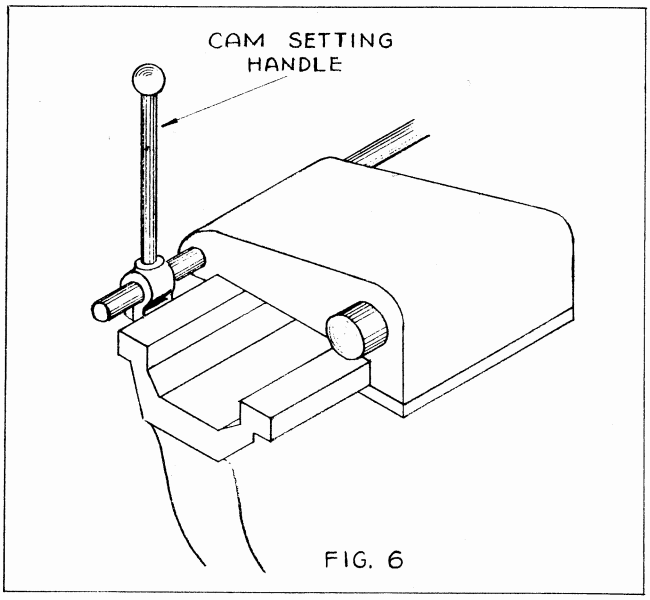

FIG. 6

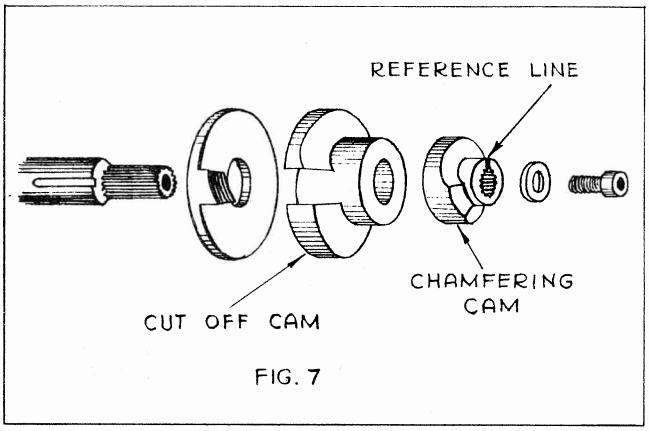

FIG. 7

Collet Opening Setting

To set the collet opening for a new size of stock, attach crank handle to slide screw and rotate clockwise until slide springs back to fully receded position. Then loosen lock screw (Fig. 2) and rotate Collet Opening Control in whichever direction is necessary until the Collet opening becomes from 1/32" to 3/64" larger than the diameter of the stock. Then tighten lock screw.

Roller Feed Setting

The Roller Feed Assembly is located inside the housing shown in Fig. 2. To set the spring pressure of Feed Rollers for a different diameter of stock, revolve the Knurled Piston "C" of the Receding Cylinder (clockwise to decrease pressure or vice-versa) sufficiently so that the feed out length of the stock will be enough greater than the length of the finished piece to provide for ejection of the butt ends of stock.

Setting the Stock Stop
*(Universal Type)

Setting the Stock Stop Target (Fig. 8) properly is essential in order to prevent rapid wear. For short lengths of work up to about 5" long, dimension "A", of Cam overlap in dwell position should be about 3/16". For longer lengths, this dimension should be increased proportionately. For lengths above 12", the small Revolving Stock Stop Target should be removed by prying off with pinch bar applied as shown in Fig. 8 and replacing with the larger Stop Target shipped with machine. For lengths over 12", it is also necessary to use the "Vee" Trough bolted to the top of the Stock Stop to catch the finished pieces.

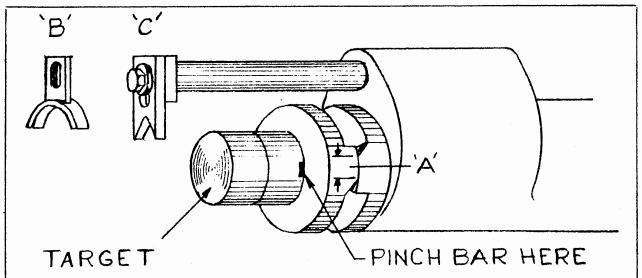

FIG. 8

Setting of the Stock Stop for Height

If Stock Stop is set too high, the short ends of bar will jam underneath, damaging both roller cutter and chamfering tool. If Stock Stop is set too low the butt ends can not pass underneath.

For lengths of tubing under 2", set the Stock Stop so the bottom of roller will be from flush with inside wall of tube at top to 1/16" below (Fig. 9). For lengths between 2 and 3" the setting should be 1/8"; 3 to 4", setting should be 3/16" (Fig. 10); 4" and greater lengths, 1/4" or a little more.

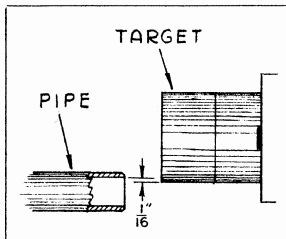

FIG. 9

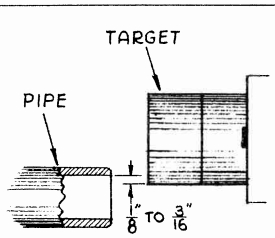

FIG. 10

Stock Stop Stripper

In order to prevent the longer work pieces (5" and over) from whipping and flying when cut off, the stock stop bracket is equipped with an adjustable stripper bar and two interchangeable strippers, "C" for stock diameters up to 3/8 diameter, and "B" for the larger diameters. (Fig. 8).

Setting of the Stock Stop to Change Lengths

Loosen stock stop saddle cap screws and stock stop link lever screw (Fig. 12). Slide the saddle in proper direction to give approximately the right length and then make final length adjustment with micrometer screw "A" (Fig. 13) after loosening nuts "B".

*See page 6 for setting the Plain Stock Stop.

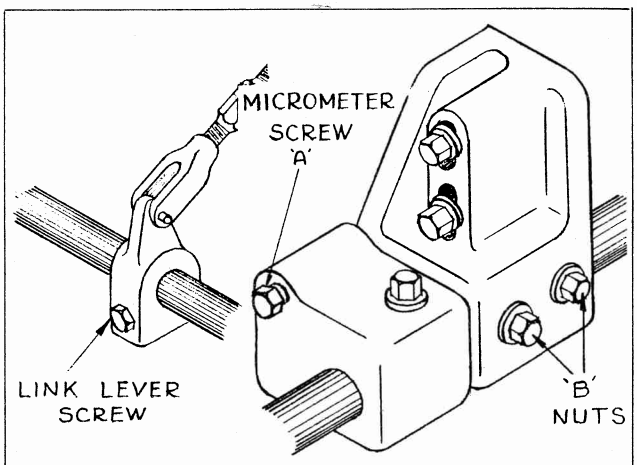

FIG. 12 FIG. 13

Adjusting the Roller Cutter

When changing set up for a larger diameter of stock, it is necessary to first slide Roller Cutter Block well away from the stock to avoid interference. To move Block, loosen Screws "B" (Fig. 14) and turn adjusting Screw "A" in required direction.

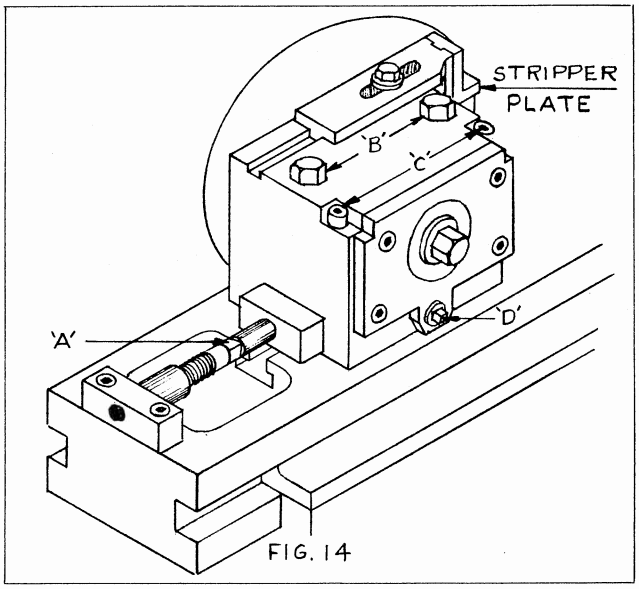

FIG. 14

To produce uniform chamfer at each end of finished part, it is necessary that Roller Cutter be centered with Chamfering Tool. Side Adjusting Screw "D" (Fig. 14) will provide the means for this adjustment after Locking Screws "C" have been loosened.

An adjustable Stripper Plate (or work deflector) is attached to the front of the Roller Cutter Block. This should be set to just clear the top of the stock by about 1/16 inch in order to prevent finished parts from damaging the Chamfering Tool when they fly off.

For sustained high speed performance and normal life expectancy of this machine, follow carefully the following -

Recommended Operating Procedure

Run machine at relatively slower speeds and lighter feeds until becoming fully conversant with all details of operation.

In case short ends of stock jam, check stock stop position, collet opening, and air pressure according to preceding instructions.

If collet tends to stick, remove collet hood and clean out the collet and the spindle bore and also check sequence valves for spring failure. These valves are located below roller feed at each end of air cylinder.

Keep machine clean and well lubricated. If machine is run on galvanized pipe, particles of this coating will flake off and work into every opening. Both the Roller Cutter Slide and the Chamfering Tool Slide should be dismantled after every 1000 hours of operation and thoroughly cleaned.

Before using a new or resharpened Roller Cutter the cutting edge should be rounded to about a .010'' radius by use of a hard oil stone.

When cutting lengths of over 4'', it is advisable to reduce the R.P.M. of the spindle to the next lower speed to give the roller feed ample time to feed out the stock. In order to maintain approximately the same rate of production as on shorter lengths, it is often possible to step up the feed to the next higher rate.

When long lengths are to be cut it may be necessary to speed up the roller feed. Since the Roller Feed Motor is fitted with a variable speed type pulley, it is only necessary to loosen and raise the motor slightly in order to increase the pulley diameter and thus increase the rate of feed.

The Roller Cutter can be resharpened until the diameter has been reduced to about 5-1/2''. Below that it will no longer reach the stock, so a new cutter will be required.

Excessive tightening of the Feed Clutch Adjusting Nut "B" (Fig. 1) will overload the thrust bearing, causing it to break down and thus damage the worm gear.

Do not change rate of feed or the spindle speed while the main motor is running.

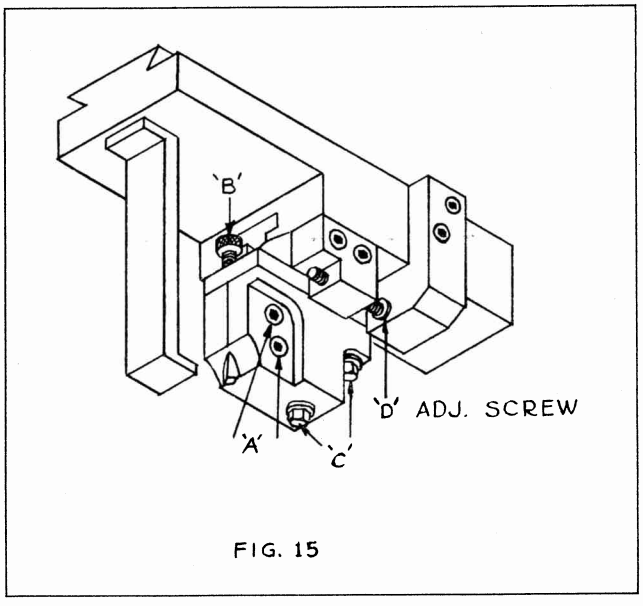

FIG. 15

Setting or Changing the Chamfering Tool

To change the Chamfering Tool, loosen screws "A" (Fig. 15.) When replacing, use the setting gage provided, to determine proper extension from tool holder and then raise backing screw "B" until it touches.

To change setting for different diameter of stock, loosen screws "C" (Fig. 15) and back out adjusting screw "D" for ample clearance before setting. Then start main motor (but not Roller Feed Motor), turn crank handle clockwise to check tool action and set as required by turning adjusting screw "D" until required depth of chamfer is obtained.

Two Roller Cutter Slide Cams (.140 and .250) and two Chamfering Slide Cams (full depth and medium depth) are normally sufficient to handle all sizes of standard pipe (on work such as pipe nipple blanks) from 1/4'' to 1-1/2''. Other stock such as very thin wall tubing or solid bars will require additional cams for either or both tool slides. Bardons & Oliver, Inc. is prepared to make prompt delivery of whatever cams may be necessary to handle any work within the capacity of the machine.

The following table lists the standard cams and their range of work -

CAM NO.	STD. PIPE SIZE	X PIPE SIZE	TUBING (WALL)	BAR DIA.
.120			.040-.060	
.140	1/8, 1/4, 3/8		.060-.080	
.160		1/8	.080-.100	
.250	1/2, 3/4, 1, 1-1/4, 1-1/2	1/4, 3/8, 1/2, 3/4	.100-.187	3/8
.312		1, 1-1/4, 1-1/2	.187-.250	1/2
		XX PIPE SIZE		
.375		1/2, 3/4	.250-.312	5/8
.437		1	.312-.375	3/4
.500		1-1/4, 1-1/2	.375-.437	7/8
.562			.437-.500	1
.625			.500-.562	1-1/8
.687			.562-.625	1-1/4
.750			.625-.687	1-3/8
.812			.687-.750	1-1/2

Recommended Procedure for Changing the Set Up

In making the change in set up for a new diameter and length, time will be saved by performing each step in the order listed below.

1. Move Stock Stop Saddle back toward end of bed. (Fig. 12)
2. Remove Collet Pads. (Fig. 3)
3. Remove Inner Plunger (Fig. 4), and replace with proper size.
4. Insert proper size Collet Pads. (Fig. 3).
5. Set Automatic Chuck Finger Holder (Fig. 4)
6. Set Stock Feed Rollers. (Fig. 2)
7. Pull stock out of Collet the required length beyond Roller Cutter.
8. Move Valve Lever "B" (Fig. 2) to the right to hold stock in position.
9. Slide Stock Stop Saddle forward until stop touches the stock.
10. Adjust Stock Stop for height. (Fig. 9)
11. Position Stock Stop Cam. (Fig. 8)
12. Tighten Link Lever Screw. (Fig. 12)
13. Move Roller Cutter Block back. (Fig. 14)
14. Set Chamfering Tool. (Fig. 15)
15. Rotate Crank Handle clockwise until Collet Chuck is fully closed and recheck position of Chuck Fingers. (Fig. 4)
16. Turn Screw "A" (Fig. 14) until Roller Cutter touches Stock then tighten the Screws "B".
17. Select proper spindle speed and start main motor only.
18. Use Crank Handle to make trial cuts for final size adjustments.
19. Adjust, if necessary, for uniform chamfer at each end of work piece. (Fig. 14)
20. Set Stripper Plate on Roller Cutter Block for clearance. (Fig. 14)
21. Start Both Motors and direct coolant onto Chamfering Tool.
22. Set Feed Change Lever (Fig. 1) to "Medium" and engage Feed Lever.
23. Make Final adjustments as required, for length, size, uniformity of chamfer, and the like.

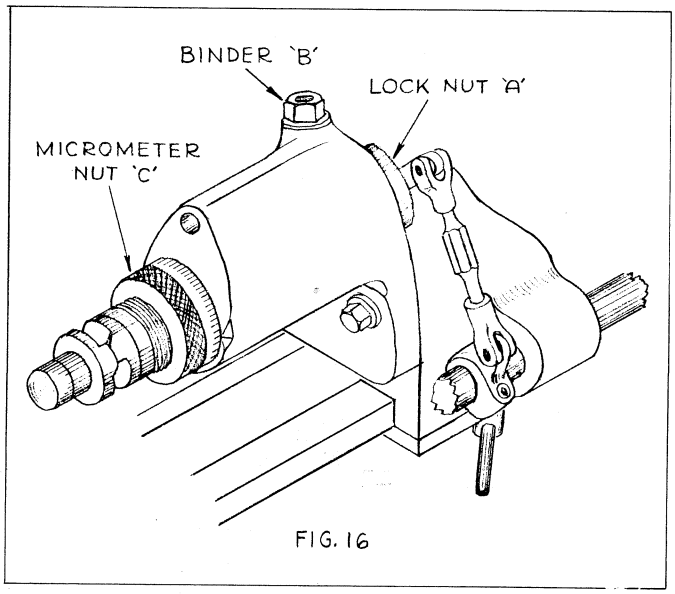

FIG. 16

Setting the Stock Stop

(Plain Type)

Fig. 16 shows a plain stock stop for cutting of stock no longer than 18". Length and cam adjustments are similar to universal stock stop Fig. 8 except for fine adjustment. For fine adjustment loosen locknut "A" and binder bolt "B", then make adjustment by turning knurled micrometer nut "C" in proper direction. After adjustment is made, lock in place.

LITHO IN U. S. A.

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