

This is BSP Section 081-745-105, Issue 1.

WOOD BORING BITS

DESCRIPTION AND USE

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#### 4. USING BITS AND DRILLS

4.01 Bits and drills will give the best service if they are kept in good repair. If a bit or drill requires pushing on the brace head to cut the wood, the indications are that it is in need of repair. Never strike the brace with a hammer to start boring with a bit or drill.

4.02 With bits the appearance of the chip is an indication of the condition of the cutting edge and outlining spur. A clean cut chip means a sharp cutter. A mangled or shredded chip usually means a dull cutter. A bit which does not feed itself properly may be in need of screw point repairs. A bent bit turns hard and ultimately binds preventing further entrance in the hole. If the chips pile up in the hole the clearance may be too great or the bit may be covered with gummy material or rust. Difficulty of this nature may, however, be experienced when boring cedar poles, especially those containing either pipe rot or checks. These conditions are similar to striking another hole, which permits the chips to drop and turn in the spiral groove. As a result, some of the chips tend to wedge between the outer edges of the bit and the side of the hole causing the chips beyond this point to pile up and clog the opening of the twist. There appears to be no remedy for overcoming this trouble and therefore it will be necessary for employees working on cedar poles to clear the holes when required during the boring operation. A bit that does not hold in the brace may not be properly placed in the jaws of the chuck or the corners of the shank may have been rounded off.

4.03 Before boring through siding or clapboard, panels, thin boards, etc., particularly if the hole is to be located near the end of the board, drill a lead hole the diameter of which is slightly less than the diameter of the lead screw with the standard automatic drill as a means of reducing the possibility of splitting the wood.

4.04 In general, a hole can be bored completely through the wood without cleaning the hole. After bit has passed completely through the hole, clear the hole by hitting

the head of the brace with the palm of the hand until the bit passes through for three or more inches. Then remove the bit by turning it counter clockwise and pulling on the head until it is all the way out. Pulling the bit without turning it out may cause the loss of balance and result in an accident. If bit turns hard making it necessary to clear the hole before completing the boring operation, back the bit out until the screw point is loose and then pull on the head of the brace and at the same time turn the brace clockwise until most of the chips have worked their way out of the hole.

4.05 If a nail or other piece of metal is encountered while boring with a bit, immediately back the tool out to clear the metal and then clean as described above. If the size of the hole permits, remove the obstruction with a cold chisel, and then proceed with the boring. Obstructions in small diameter holes will necessarily have to be bored through with an installer's drill.

4.06 Bits, particularly the expansive bits, have a tendency to break out the wood around the bottom of the hole when completing the boring operations. This difficulty can be overcome by firmly backing up the location of the hole with a small block of wood until the bit has passed completely through the hole being bored. This practice shall be followed wherever practicable.

4.07 If the cutting edges of an installer's drill are dull the boring will be difficult and if the edges are not of equal length, a hole larger in diameter than desired will be obtained. If the cutting edges do not form a uniform angle with the axis of the drill only one side will do the cutting. If the cutting edges of the drill have not been backed off sufficiently to provide the proper clearance or the web is too thick, considerable pressure will be required on the head of the brace to remove only a small amount of wood. When using installer's drill in solid wood, the hole should be cleared of the chips every 10 to 15 turns.

4.08 Bits or drills shall not be placed or left upon a highway, sidewalk, or property accessible to the public, where they or vehicles may be damaged, or where they may constitute a potential hazard or source of injury to persons and livestock.

4.09 When carrying bit or drill always direct point away from body and hands.

4.10 Before boring hole, make certain that there is no obstruction (gas, water, or soil pipe) in the path of the bit or the drill and it will not come in contact with foreign wires or fixtures. Observe the direction of the lag bolts holding foreign wire pole attachments with a view toward obtaining clearance for through bolt. Bear in mind that walls or other locations may conceal wires or pipes.

4.11 When stationed on the opposite side of partition, pole, etc., observe where bit or drill is coming through and assume a position so there is no likelihood of being injured if the bit or drill is suddenly projected through the wall, pole, etc.

4.12 When boring a deep hole, sight along the bit after it has been started, to determine whether it will terminate at the desired location.

#### 5. TRANSPORTING AND STORING BITS AND DRILLS

5.01 Proper care must be taken of bits and drills at all times in order that they will give satisfactory service and so that injury or damage will not result from an exposed point or cutting edge. Bits and drills shall be placed in tool rolls, racks or pockets of trucks or tool chests provided for the purpose of protection.

5.02 New bits and drills shall be left in the original container until required for disbursement. If the container is broken and it appears advisable to remove either the bits or drills from the container or if bits or drills are returned from the field for storage, they shall be placed on the shelves with the points facing the back of the shelves.

#### 6. INSPECTION ROUTINE

6.01 Each employee, on receipt of and at least once a week thereafter, shall make an inspection of the bits and drills in accordance with Part 7 in order to determine whether any fault may have developed.

6.02 Each employee shall at all times assume the responsibility of determining that the bits and drills in his possession are in good condition and their appearance does not indicate injury or defects sufficient to impair their usefulness.

6.03 Bits and drills shall be checked inspected periodically (not less frequently than 3-month intervals) and the employee performing this work shall see that all instructions contained herein are complied with.

#### 7. INSPECTION OF WOOD BORING BITS AND DRILLS

7.01 Bits and drills should be examined to determine their condition as suggested below. In connection with the inspection of bits the important conditions to look for are:

- A. Auger, Construction and Insulator Pin Bits.
  - a. Broken screw point or threads badly marred.
  - b. Dull spur or edge badly nicked or bent.
  - c. Spur lower than cutting edge.
  - d. Dull or badly nicked cutting edge.
  - e. Twist of bit bent.
  - f. Round of bit bent.
  - g. Shank marred.
- B. Expansive Bits.
  - a. Broken screw point or threads badly marred.
  - b. Dull or bent spur or edge badly nicked.
  - c. Spur lower than cutting edge of head.
  - d. Dull cutter spur or edge badly nicked.

- e. Top of cutter spur lower than cutting edge of cutter.
- f. Dull or badly nicked cutting edge of head.
- g. Dull or badly nicked cutting edge of cutters.
- h. Round of bit bent.
- i. Shank marred.
- j. Threads of adjusting screw stripped and slot badly marred.

**C. Installer's Drills.**

- a. Dull cutting edges or edges badly nicked.
- b. Cutting edges of unequal length and angle formed with the axis of the drill not uniform.
- c. Insufficient clearance back of cutting edge.
- d. Twist broken, bent or less than 2 inches in length.
- e. Round of drill bent or broken.
- f. Shank marred.

7.02 If tools for repairing bits and drills have not been provided for that purpose and any of the above conditions are found to exist or if the condition of the bits and drills is such that they do not appear satisfactory from a safety standpoint, they should be exchanged at once for bits and drills in good condition, in accordance with the company's established routine.

7.03 If tools have been provided for repairing bits and drills and if any of the above conditions that warrant repairing are found to exist, they shall be maintained in accordance with Parts 9 and 10.

**8. TOOLS REQUIRED FOR MAINTAINING WOOD BORING BITS AND INSTALLER'S DRILLS**

8.01 The following tools are required in connection with the performance of the maintenance of bits and drills as covered in these practices.

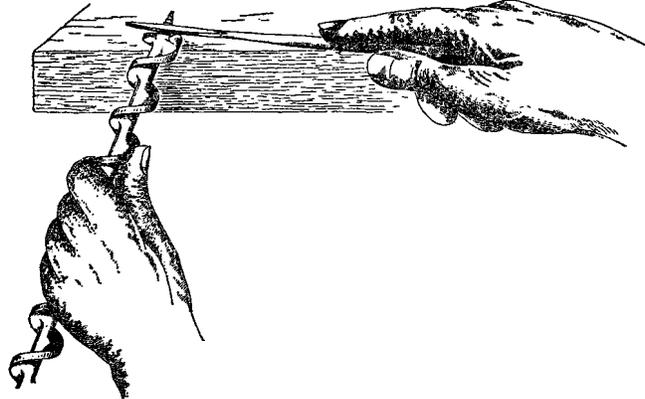
Tool	Use
File, Bit, Auger, 7 Inch	For use in sharpening screw point spur and cutter.
File, Lineman's	For use in dressing shank.
File, Round, Second Cut, 5 Inch	For use in thinning web of drill.
Hammer, Claw, 1-1/2 lb.	A substitute for the wooden mallet. For use in straightening the round and the twist of drill and bit.
Hammer, Riveting, 7 oz.	For use in straightening the outlining spur.
Mallet, Wooden (to be obtained locally)	For use in straightening the round and the twist of a drill or bit.
Paper, Abrasive, Fine	For use in polishing bad rust spots on the shank, center and twist of bits or drills.
Rag, Oily	For treating bits and drills to prevent rusting.
Rule, 2 ft. or 6 ft.	For use in determining the angle of the cutting edge of the drill.

**9. MAINTAINING WOOD BORING BITS**

9.01 The following maintenance methods have been found satisfactory for use of the field force. The illustrations cover the position for a right handed man.

**A. Maintaining auger, construction and insulator pin bits.**  
**1. Resharpener Screw Point.**

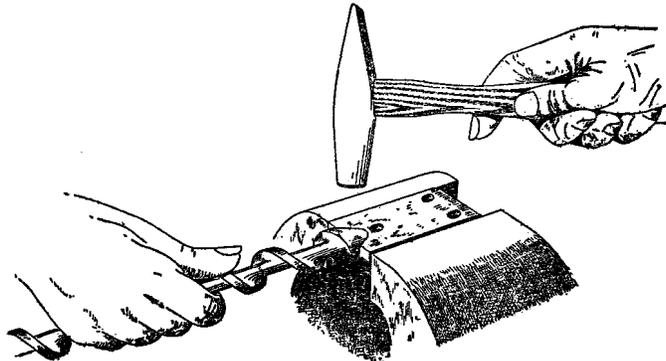
The threads of the screw point should not be resharpened unless very dull or badly marred. To restore the threads, rest the bit on the edge of a supporting wood surface with the screw pointing upwards.



Place an edge of auger bit file on the bottom of the thread near the cutting edge. Revolve the bit slowly and at the same time file the thread using short, light strokes. Continue this until the point of the screw is reached. A screw point with the initial threads badly marred or broken off shall be repointed with a file. If too blunt a point is obtained to take a hold in the wood the bit shall be returned for a new one.

**2. Restoring Bent Spur.**

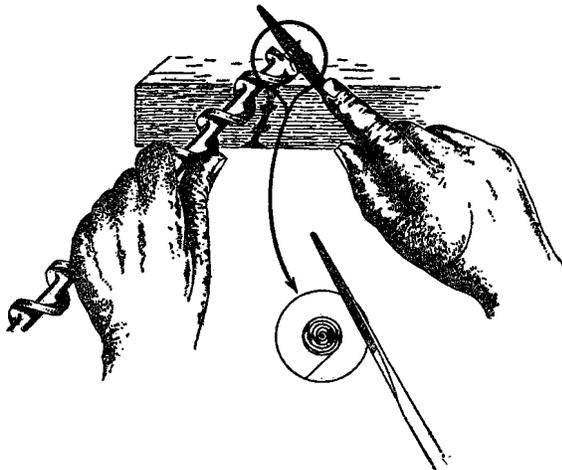
If the spur of a bit has been bent it shall be straightened with a light hammer such as a riveting hammer as shown below.



If, after straightening the spur, the cutting edge appears to be jagged or rolled, the outside surface near the cutting edge may be "touched up" with a file.

**3. Resharpening Spur.**

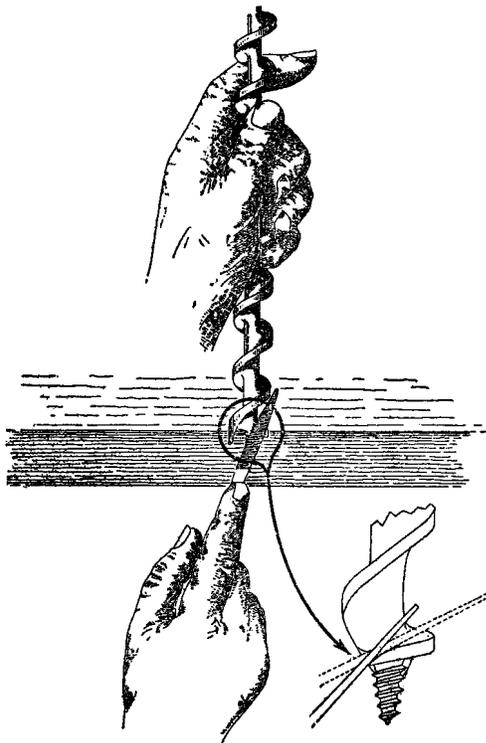
Hold the bit against a wood support with the point up and then place an auger bit file on the inside of the spur on the front edge which performs the cutting.



Sharpen this cutting edge by pressing lightly on the file and keeping it at an angle that will limit the amount of metal removed. Except for "touching up" never file the outside of the spur as this will destroy the clearance and cause the bit to bind or stick. The foremost edge of the outlining spur must extend beyond the cutting edge for efficient boring. If such is not the case the bit shall be returned for a new one.

**4. Resharpening Cutter.**

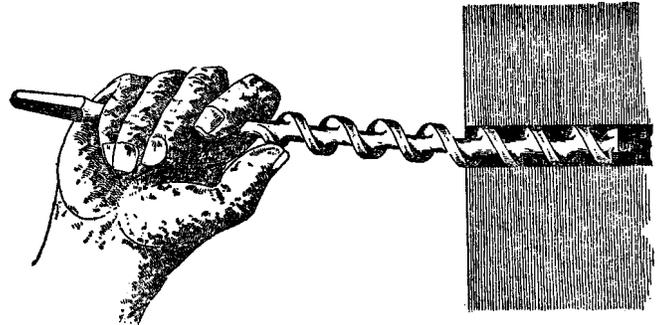
Hold the bit in the left hand with the point down resting the top of the screw point against the edge of a bench or other suitable support so that the cutting edge is parallel with the edge of the bench or other support.



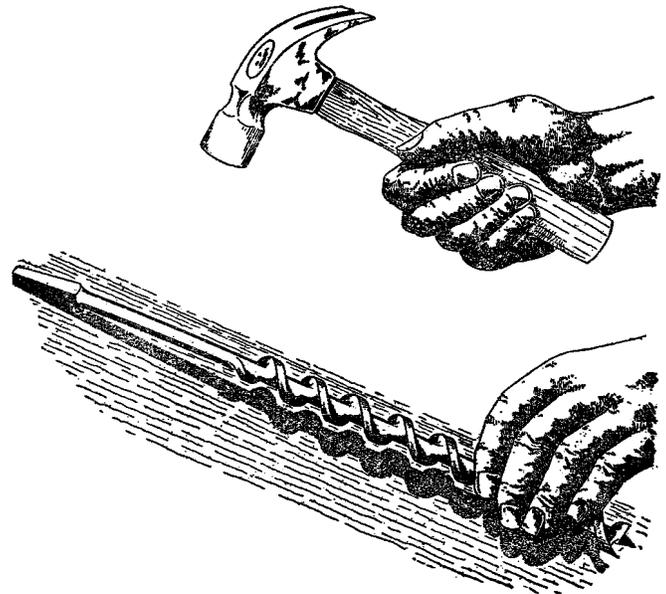
With an auger bit file, sharpen the cutting edge, using light strokes, to a straight line keeping the bevel as near as practicable the same as it was when new.

**5. Straightening Bit.**

To straighten bit bore a hole to the depth of the bend, in a solid timber that has been securely anchored. Then pull on the shank, in a direction opposite to the bend of the bit, until the distance traveled is sufficient to remove the bend. If available, a vise may be used for holding the bit. The bit should be protected from injury by placing solid pieces of wood between the sides of the bit and vise jaws.



If the bit remains slightly bent it may be straightened by placing it on a solid, flat, wooden surface and tapping it lightly with a smooth faced wooden mallet, if available, or a hammer on the opposite side from the bend. This method shall also be used for sprung or slightly bent bits.



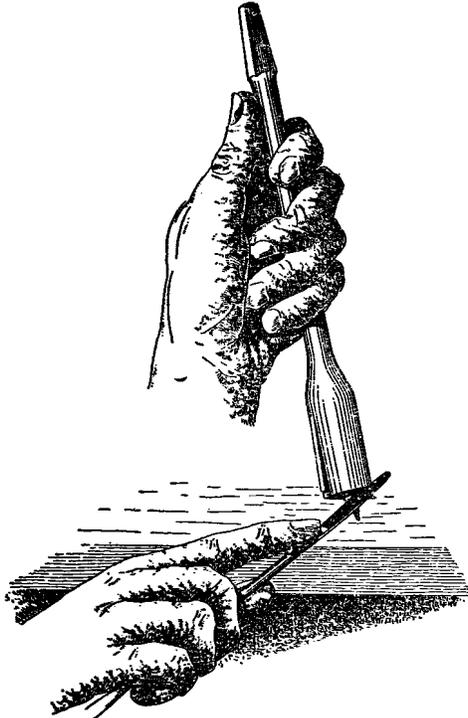
A badly bent bit that cannot be straightened by these methods in a reasonable period of time shall be exchanged for one satisfactory for use. To determine whether a bit is straight, lay it on a flat surface, then roll it. If it rolls evenly it is straight.

**6. Squaring Shanks.**

Shanks with slightly rounded edges may be squared by filing the flat faces with a lineman's file. If the edges of the shank of the bit are rounded to the extent that the chuck of the brace will not hold the bit after being filed it shall be exchanged for one satisfactory for use.

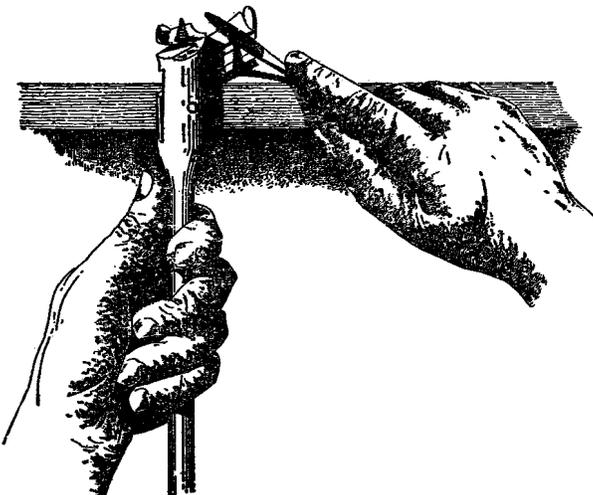
**B. Maintaining Expansive Bit.**

1. Resharpener Screw Point.  
Maintain in accordance with Paragraph 9.01-A-1.
2. Restoring Bent Spur.  
Maintain in accordance with Paragraph 9.01-A-2.
3. Resharpener Head and Cutter Spur.  
Maintain in accordance with Paragraph 9.01-A-3.
4. Resharpener Head Cutter.  
Hold the bit in the left hand resting on a solid surface as shown.



With an auger bit file, sharpen the cutting edge, using light strokes, to a straight line keeping the bevel so far as possible the same as it was when new.

5. Resharpener Edge of Cutter.  
Move the cutter out to the maximum size hole that the bit is used for. Hold the bit in the left hand with the point up and the back of the cutter resting on a solid support as shown.



With an auger bit file, sharpen the cutting edge, using light strokes, keeping the bevel so far as practicable the same as it was when new. Test keenness of edge by drawing a small stick of wood across the cutting edge. If a sliver of wood is easily removed the cutting edge is satisfactory for use.

6. Squaring Shank.  
Maintain in accordance with Paragraph 9.01-A-6.

9.02 Moisture from the hand, as well as that found at seashores and in foggy territories or sap from green timber, etc., may occasionally cause spots of rust to appear on a bit. To prevent this the bit should be wiped off with an oily rag. Fine abrasive paper may be used to polish up bad spots on the shank, round or twist of bits. Such material, however, should not be applied to any cutting edge, spur or screw.

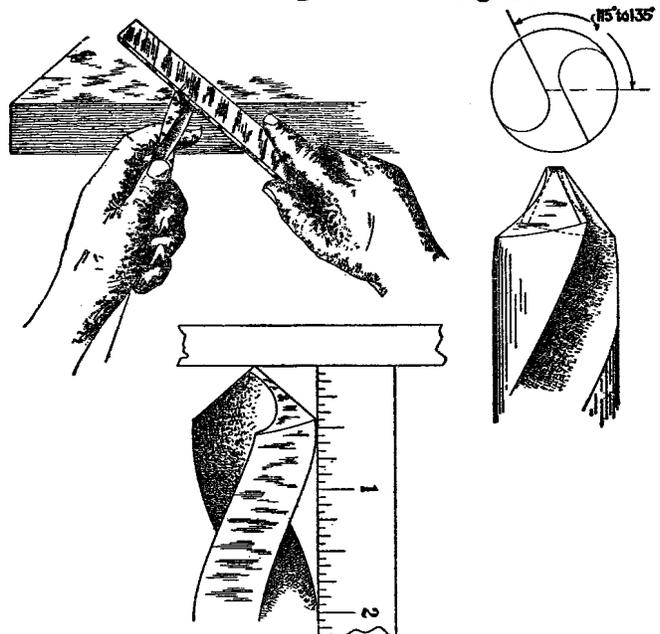
**10. MAINTAINING INSTALLER'S DRILLS**

10.01 In general, drills should be returned to the storeroom for resharpening where the work is performed on an abrasive wheel and employees have been trained in the grinding so as not to draw the temper. If an abrasive wheel has not been furnished the field forces, and slight field repairs are required, the drill may be sharpened with a file.

10.02 The following maintenance methods have been found satisfactory for bits that have been tempered to permit removal of metal with a file.

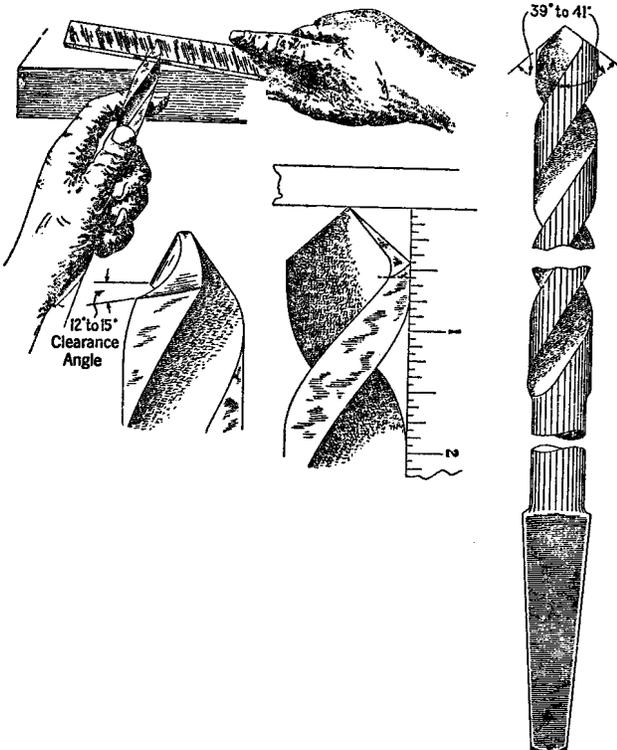
**A. Resharpener Cutting Edge.**

Hold the drill against a solid support with the point up filing a flat surface behind the cutting edge for clearance, then file the other side taking care to keep the drill at the same angle for both cutting edges and so that filing does not change the angle of the chisel point (center of drill) which is between 115 degrees and 135 degrees.



**B. Providing Clearance Back of the Cutting Edge.**

File the back of the flat surface so that it will curve into the remaining surface just back of each cutting edge. To do this the file should be turned slightly during the filing operation so as to obtain a clearance angle between 12 degrees and 15 degrees.

**C. Straightening Round of Drill.**

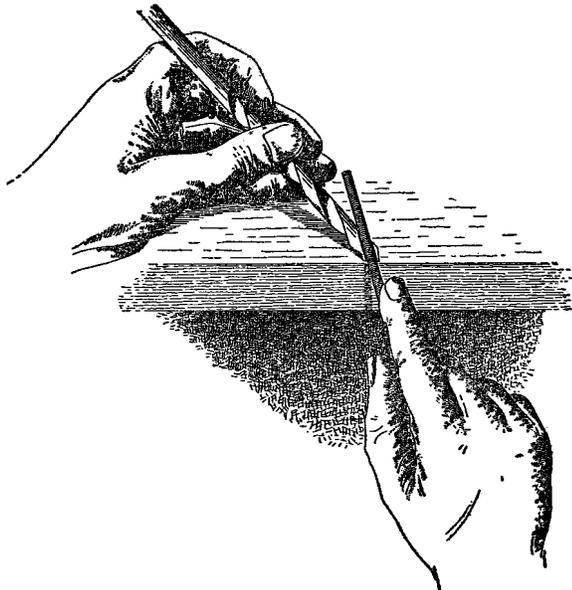
Maintain in accordance with Paragraph 9.01-A-5.

**D. Squaring Shank.**

Maintain in accordance with Paragraph 9.01-A-6.

**E. Thinning Web.**

With a round file remove sufficient metal from both sides of the web as shown so as to permit the chips to travel out of the grooves.

**F. Removing Rust.**

Maintain in accordance with Paragraph 9.02.

10.03 The four points which should be attained in a correctly ground or filed drill are as follows. These points can be obtained by preserving as closely as practicable the original form of the drill.

- a. Providing the cutting edges with a uniform angle with the axis of the drill.
- b. Obtaining cutting edges with exactly equal length.
- c. Obtaining sufficient clearance back of the cutting edge.
- d. Obtaining sufficient depth of grooves.

**11. SAFETY PRECAUTIONS**

11.01 Care should be exercised to observe the following precautions when handling bits and drills.

- a. Bits and drills shall not be placed or left upon highway, sidewalk or property accessible to the public, where they or vehicles may be damaged or where they may constitute a potential hazard or source of injury to persons (particularly children) or livestock.
- b. Bits shall be raised aloft on a pole by means of a canvas bucket or a handline. Bit shall not be assembled in a brace to be raised aloft in a canvas bucket.
- c. When placing bits and drills on shelves, the points shall face the back of shelves.
- d. Never transport bits and drills loose in tool boxes or compartments. (See Paragraph 5.01.) Tools being returned for junking excepted.
- e. Do not pull either a bit or a drill from a completed hole, back it out by turning. (See Paragraph 4.04.)
- f. Place bit or drill in brace so that the jaws catch the edges of the shank.
- g. When finished with bits and drills place them in the receptacle provided for the purpose of protection.
- h. When stationed on the opposite side of partition, pole, etc., observe where bit or drill is coming through and assume a position so there is no likelihood of being injured if the bit or drill is suddenly projected through the wall, pole, etc.

**12. STANDARD REPAIRS**

12.01 The employees in the field, if furnished with maintenance tools, shall maintain bits and drills in accordance with the instructions contained herein. All bits and drills requiring other repairs shall be returned to the storerooms and repaired under the company's established routine.

**13. DISPOSITION OF WOOD BORING BITS AND INSTALLER'S DRILLS**

13.01 Bits and drills found to be defective shall be tagged "defective" or "N.G." and returned to the storeroom promptly or upon the approval of the supervisor may be disposed of on the job.

13.02 Bits and drills drawn from stock for a particular job shall, upon completion of the work and when there is no known need for them in the immediate future, be returned to the storeroom properly tagged as "satisfactory" or "O.K." or "defective" or "N.G." as the conditions warrant, in order to keep the tools issued to employees at a minimum.