regular emery wheel, one-quarter inch thick.

The beginning of the lobe *B*, is ground with a wheel of small diameter, to avoid striking the corner of the preceding lobe *C*.

Boston, Mass. S. N. BACON.

## Making Small Extension Drills by Brazing

Of the various methods described in mechanical papers for making small extension drills used for deep-hole drilling, I have as yet not seen one that described the making of them by brazing.

An ordinary twist drill, say number 35, is beveled off at an angle of about 70 degrees at the shank end, as shown in Fig. 1. A piece of drill rod one size smaller, to allow the drill to more readily clear itself of chips and prevent binding, is cut off to the required length, and also beveled off at an angle of 70 degrees. The two are then placed in the V-slot in

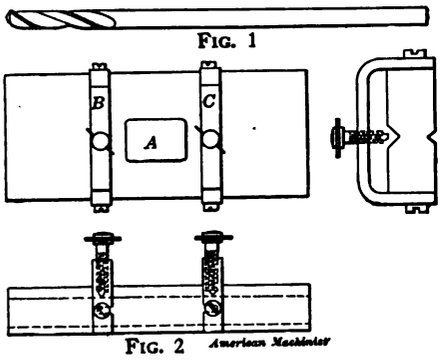



FIG. 1

FIG. 2

MAKING SMALL EXTENSION DRILLS

the fixture shown in Fig. 2, preparatory to brazing, so that the beveled ends come in the center of the slot *A*, and also in line with each other.

This fixture has two V-grooves and can also be used for soldering small tubing, etc. The parts *B* and *C*, by the aid of the two screws shown, hold the drill and drill rod in position and prevent them from turning while being brazed. These parts can readily be adjusted for use on either side of the fixture by simply loosening the screws.

The fixture is then placed in the vise so that the beveled ends can be conveniently heated by a bunsen burner, the flame coming through the slot and directly in contact with the beveled ends. Before heating a piece of wet waste is laid on the hardened part of the drill to prevent the temper from being drawn.

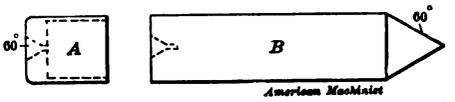
After brazing the superfluous metal from the brazing compound is filed off in a speed lathe, and the drill is ready for use.

Waterbury, Conn. CHAS. DOESCHER.

## An Indicator Center

I have one of the Starrett dial-test indicators, and when I tried to use it on a jig button, I found the button was so short that the indicator would strike the work before it would touch the button, so I hit on this center which is made of tool steel, hardened and ground.

The cut explains itself. The bushing *A* is made to fit the button and is counter-




AN INDICATOR CENTER

sunk at the outer end to fit the center *B* which is ground to 60 degrees. The countersunk end of the center rests on the lathe center. In use the bushing is slipped over the button and the center placed in position. The tail center of the lathe is then brought up snug against the indicator center. By placing the indicator as close to the button as possible, the slightest untruth of the button can be determined by turning the lathe.

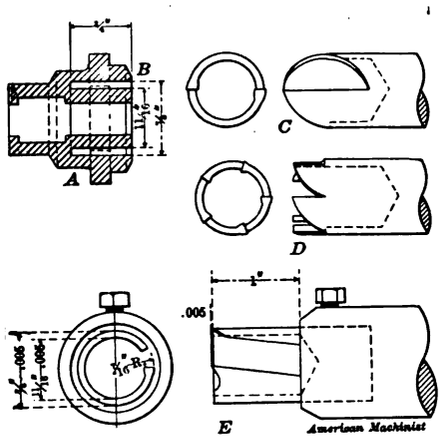
JAMES K. CLOUD.

Logansport, Ind.

## The Tools for Cutting a Slot in a Valve Bonnet

At *A* is shown the bonnet, in section. It is part of a brass valve and the difficult part was to make a tool which would cut the slot *B* and not break.

The first tool *C* had two cutting edges, as shown, and while it worked all right in the engine lathe when experimenting, it would not work in the turret lathe satisfactorily and gave a lot of trouble by breaking. The tool *D* was then made with five teeth but this also broke repeatedly.




TOOL FOR CUTTING SLOT IN VALVE BONNET

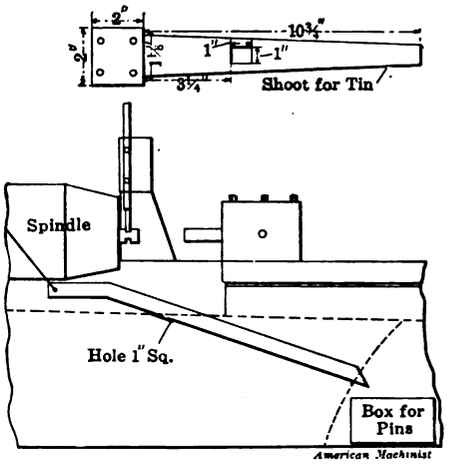
It was found that the breakage was caused by the tools digging into the work. I then made the single-tooth tool *E* which is perfectly straight in front with the exception of the cutting edge which projects 0.005 inch beyond it. This tool cannot dig in and clears itself of chips very readily.

PETER SIEBOLD.

Philadelphia, Penn.

## Separating Small Pins from Chips and Oil

We were making a lot of 28,000 pins ¼ inch diameter, 5/32 inch long, on a Hartford automatic and had all kinds of trouble picking them out of the chips and oil, taking longer than it did to make them. I made a chute of tin shown in the cut, which not only kept them from the chips but kept them practically free from oil. The chips, being light, would be washed down the hole by the oil, while the pin being heavier, would bound over




SEPARATING WORK FROM CHIPS AND OIL

the hole and down the chute into a box with holes punched in the bottom, allowing the oil to drain off.

Springfield, Vt. H. C. M.

## Course of Lectures

An interesting course of lectures has been arranged by the Stevens Engineering Society, Stevens Institute, Hoboken, N. J., to be delivered at the institute at 4 p.m. on the dates and subjects given:

"Membership in Engineering Societies;" Alexander C. Humphreys, October 18.
"Design and Construction of a Central Station;" Irving E. Moulthrop, November 1.
"Art and the Engineer;" James P. Haney, November 15.
"With Peary in the Arctic;" Donald B. MacMillan, November 22.
"Services of Chemistry in the Promotion of Public Welfare;" Harvey W. Wiley, November 29.
"The Story of an Island;" Rossiter W. Raymond, December 6.
"The Origin of Petroleum;" David T. Day, December 20.
"The Kimberley Diamond Mines;" Gardner F. Williams, January 10.
"The Development of the Railroad on the North American Continent;" James Douglas, January 16.
"The Catskill Water Supply Project;" John A. Bensel, February 7.
"The Electric Furnace;" Carl Hering, February 14.
"Reclamation;" F. H. Newall, February 20.
"Metallography as Applied to Engineering;" William Campbell, March 7.
"Radioactive Phenomena;" A. Stanley MacKenzie, March 21.
"Illuminating Engineering;" George E. Hulse, April 4.