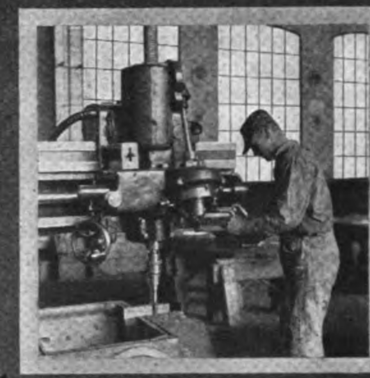
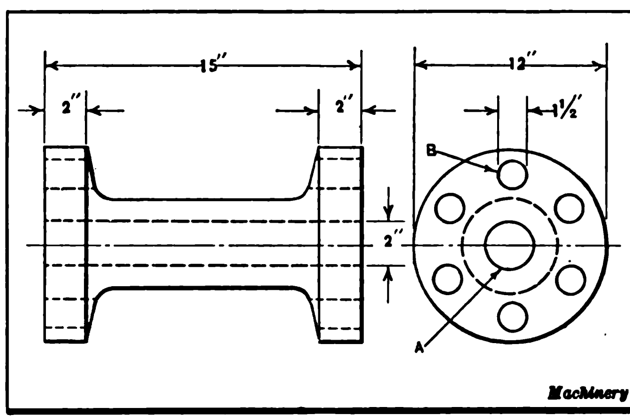
Letters on Practical Subjects



BORING EVENLY SPACED HOLES

The spool-shaped turret shown in the accompanying illustration is used on a special machine. It will be noted that there are six holes in the flanges, and these holes are required to be accurately spaced and in accurate alignment.

As six turrets like the one shown were to be made, the problem of boring the holes in such a manner as to obtain the required degree of accuracy was given careful consideration. The method finally adopted is described in the following. First the center hole *A* in the turrets was bored and reamed to size, after which the castings were rough-machined all over. The six holes *B* were then laid out on one of the flanges and rough-drilled in an upright drilling machine.



Turret having Six Holes that must be accurately spaced and aligned

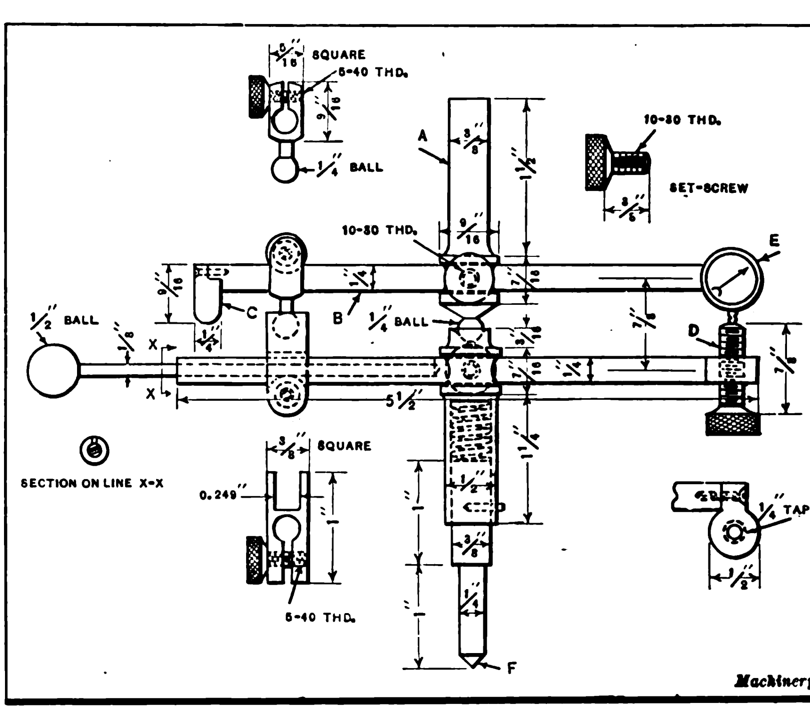
After the drilling operation, the turrets were again put on an arbor held between the lathe centers and the flanges turned to exact size and the ends faced, bringing the length to exactly 15 inches. Next, the parts were clamped to the faceplate of a dividing head mounted on a milling machine, a center plug in the dividing head spindle being used to locate the work. The dividing head used for this operation was of the direct indexing type having a large index-plate. After obtaining the exact radial setting by trial, one of the holes *B* was bored to size through one of the flanges. The other five holes were then bored by indexing and boring in the usual manner. After boring the holes in the first turret, radial and chordal dimensions were carefully checked and found to be correct. One of the flanges on each of the six turrets was bored in this manner, after which a 20-inch lathe was set up for boring the other ends of the turrets.

The faceplate of the 20-inch lathe was first trued up, and a short plug fitted into the spindle and turned down to fit the turret holes. The work was then clamped to the faceplate with the turned plug located in one of the holes. As the work was off center, it was necessary to employ a counterbalance. After mounting the work on the faceplate in this manner, the hole in the opposite end of the turret was bored to size with a regular lathe tool held in the toolpost. Next, the first pair of holes was tested for alignment, after which the other five holes were bored to size, resetting the work for each boring operation. The alignment of the holes and the chordal distance were carefully checked after each hole was bored.

Woonsocket, R. I. S. W. Brown

CENTERING DEVICE

The device shown in the accompanying illustration was designed by the writer for use in truing up a center-punch mark with the machine spindle when the work is held stationary, as in the case of a milling machine job. With the device shown, it does not matter if the collet or chuck that holds the shank *A* fails to run true.



Device for bringing Center-punch Mark into Alignment with Machine Spindle

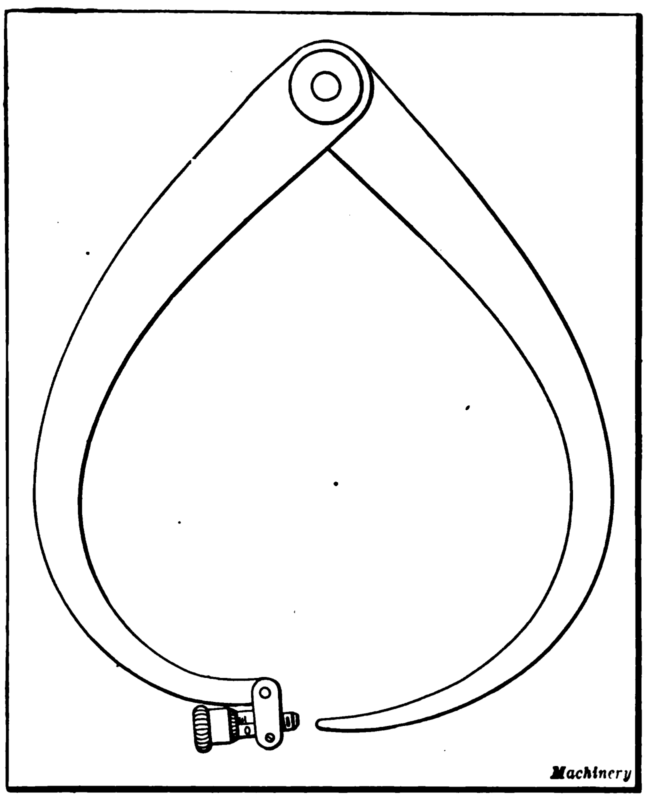
The shank *A* is held in the machine spindle, and the point *F* is placed in the center-punch mark in the work that is to be brought into alignment with the spindle. Readings are taken from the indicator *E* after each quarter revolution of the device. If the indicator reading is the same for all four positions, it is obvious that the center mark in the work is in line with the spindle of the machine. Should the readings be unlike, the work must be shifted till the readings are all the same.

The rod *B* is made of sufficient length to permit the indicator to show even a slight error in alignment. If the indicator *E* is not used, the rod *B* is turned around and the gaging point *C* used in connection with thickness gages placed in contact with the point of screw *D* which is 1/4 inch in diameter, 40 threads per inch. The general construction of the device is shown quite clearly by the illustration. If the work is carefully laid out and properly center-punched at the intersection of two lines, very accurate work can be obtained.

Philadelphia, Pa. HUGO LJUNGQUIST

CALIPER WITH MICROMETER ADJUSTMENT

In shops where press fits are required on a large percentage of the work machined, and where the allowances for the fits are determined by the judgment of the individual machinist, a caliper such as shown in the accompanying illustration will be found a great convenience. A caliper of this kind has proved very useful in machining axles for locomotives and cars where the fits are governed by the number of tons pressure required to assemble the parts.



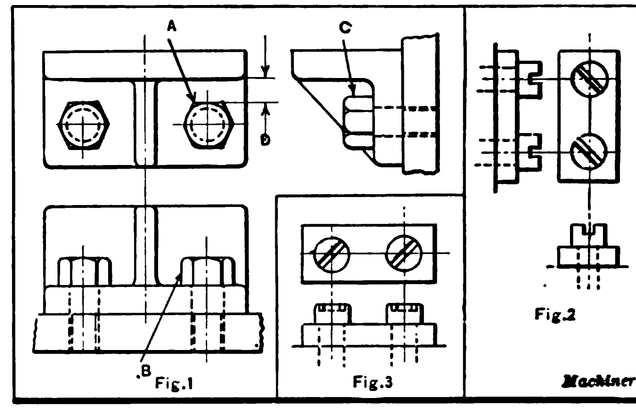
Caliper equipped with Micrometer

The caliper is made from an ordinary pair of lap joint calipers. A 3/16-inch hole is drilled at the end of one leg and a small micrometer such as is used in measuring the thickness of sheet metal is secured to the caliper as shown. Part of the frame of the micrometer is sawed away and the remaining part split to form a fork which is drilled and riveted to the drilled end of the leg. The particular caliper shown measures 12 inches from the micrometer point to the center of the lap joint.

Joliet, Ill. E. B. RODGERS

METHOD OF DRAWING SCREW-HEADS

No man who possesses any degree of ingenuity can work at a trade or special line of work without devising a few little individual kinks that make his work either easier, better, or more clearly understood by others.



Figs. 1 to 3. Methods of showing Bolt and Screw Heads

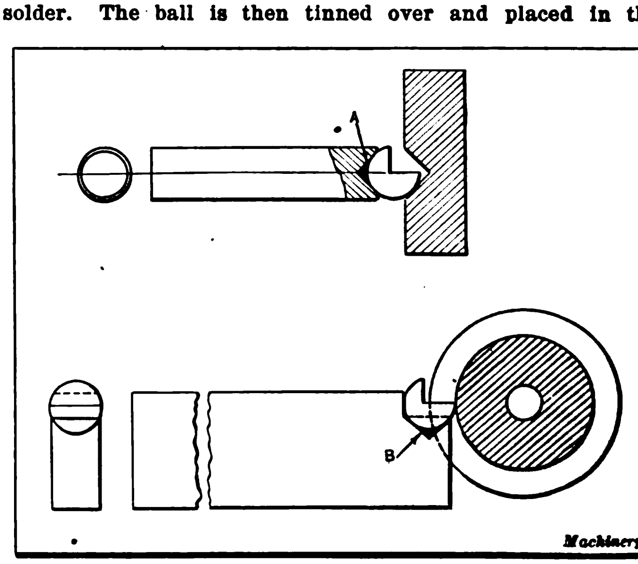
A kink of this kind that the writer has found of value in making assembly drawings is that of showing screw-heads in the manner indicated in Fig. 1. It will be noted that the plan view at *A* and the front elevation at *B* are shown in the conventional manner, but that the side elevation at *C* is the same as the front elevation view at *B*. In other words, by always showing the front or side elevations of hexagonal-head bolts in the manner indicated at *B* the designer will not make the mistake of providing an insufficient clearance at *D*. The assembly views will be more easily read, as a true projection of a hexagonal-head bolt or nut looking across flats appears the same as a square-head bolt or nut. Always show the elevations of a square-head setscrew in the same manner. In showing fillister-head, flathead, and round-head screws, the elevation views should be as shown in Fig. 2 and not as indicated in Fig. 3. The plan view of screws of these types should have the screwdriver slot shown at an angle of 45 degrees, as this adds distinction and clearness to the view.

Marion, Ind. HENRY ROBISON

SPHERICAL FORMING TOOLS

For a number of years the writer has used a method of making spherical forming tools that may be of interest to MACHINERY'S readers. Briefly, the method consists of mounting a steel ball of the required diameter in a holder and then cutting away a portion of the ball in such a way as to leave a cutting edge having its face in line with the center of the ball. In the upper view of the accompanying illustration, the ball used as a forming tool for cutting a spherical or ball seat is shown mounted on a piece of 1/2-inch cold-rolled steel. This tool may be used on a drill press or lathe.

In mounting the ball on the holder, the first step is to countersink the end of the holder and fill the cavity with solder. The ball is then tinned over and placed in the



Forming Cutters made from Steel Balls