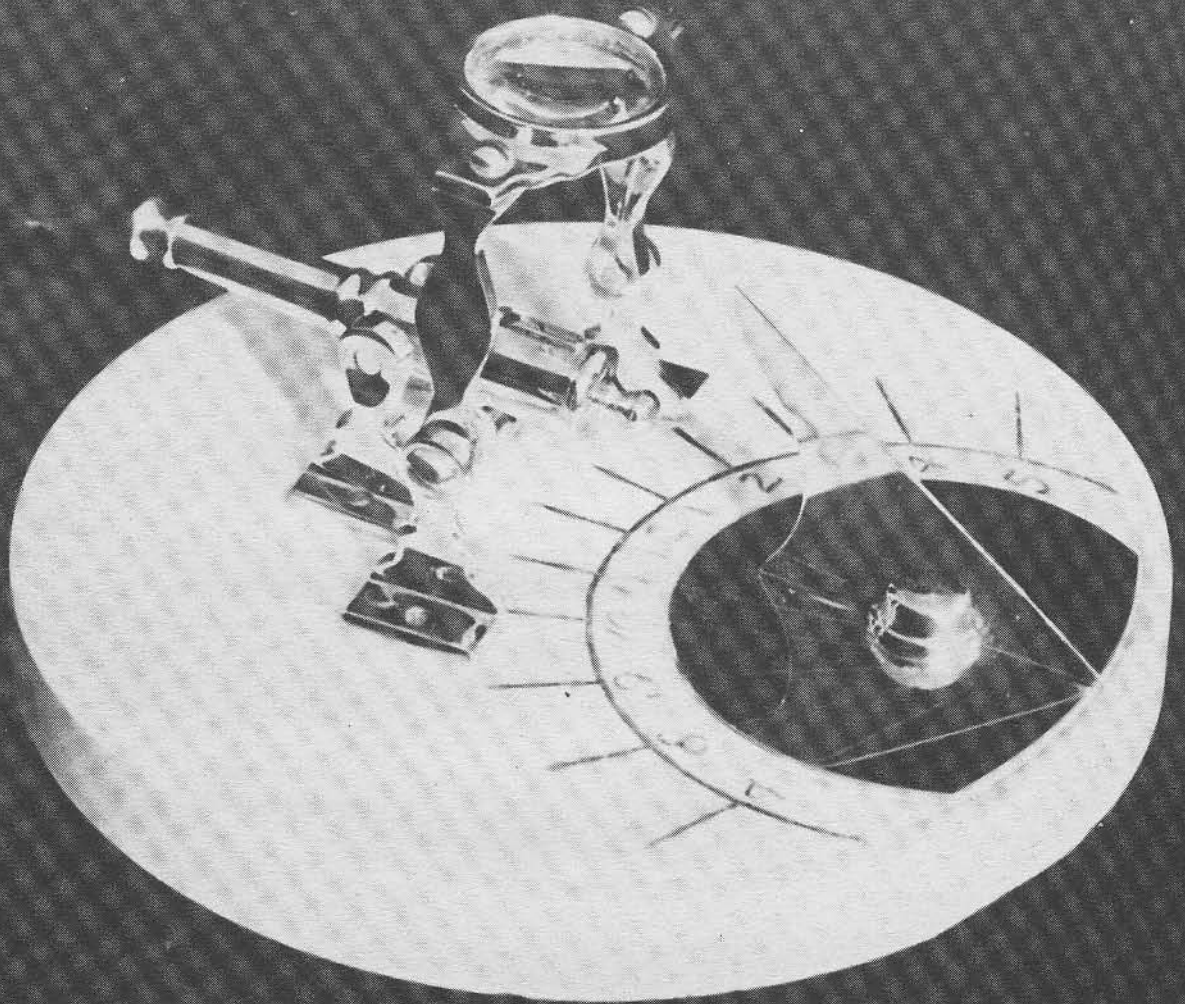


Chapter 22



TIME FOR A CANNON

This Reproduction Of A Shooting Sun Dial Is Easily Built and Makes A Great Conversation Piece!

ONE OF THE most interesting, unusual, unique and rare of all medieval black powder firing devices is the little-known black powder shooting sun dial cannon.

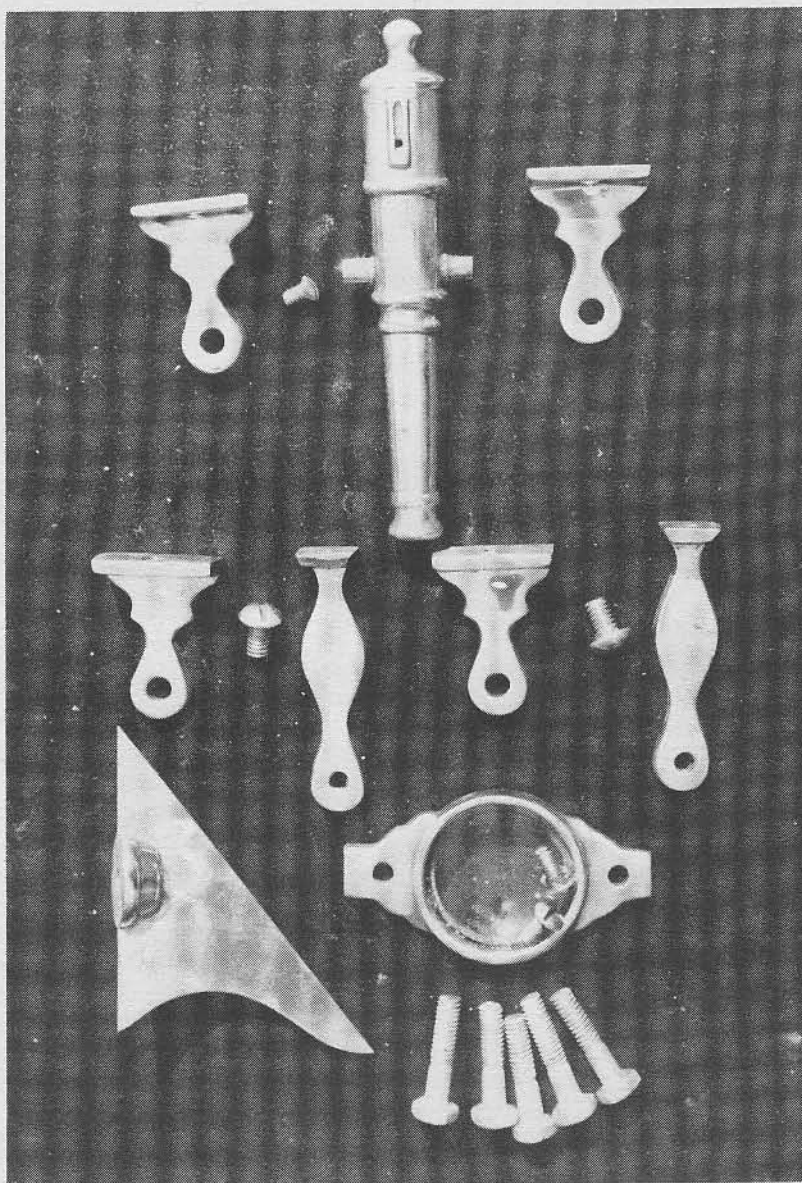
It has been suggested that Galileo, the Italian astronomer and physicist (1564-1642), designed and built the first of these little time pieces sometime early in the Seventeenth Century.

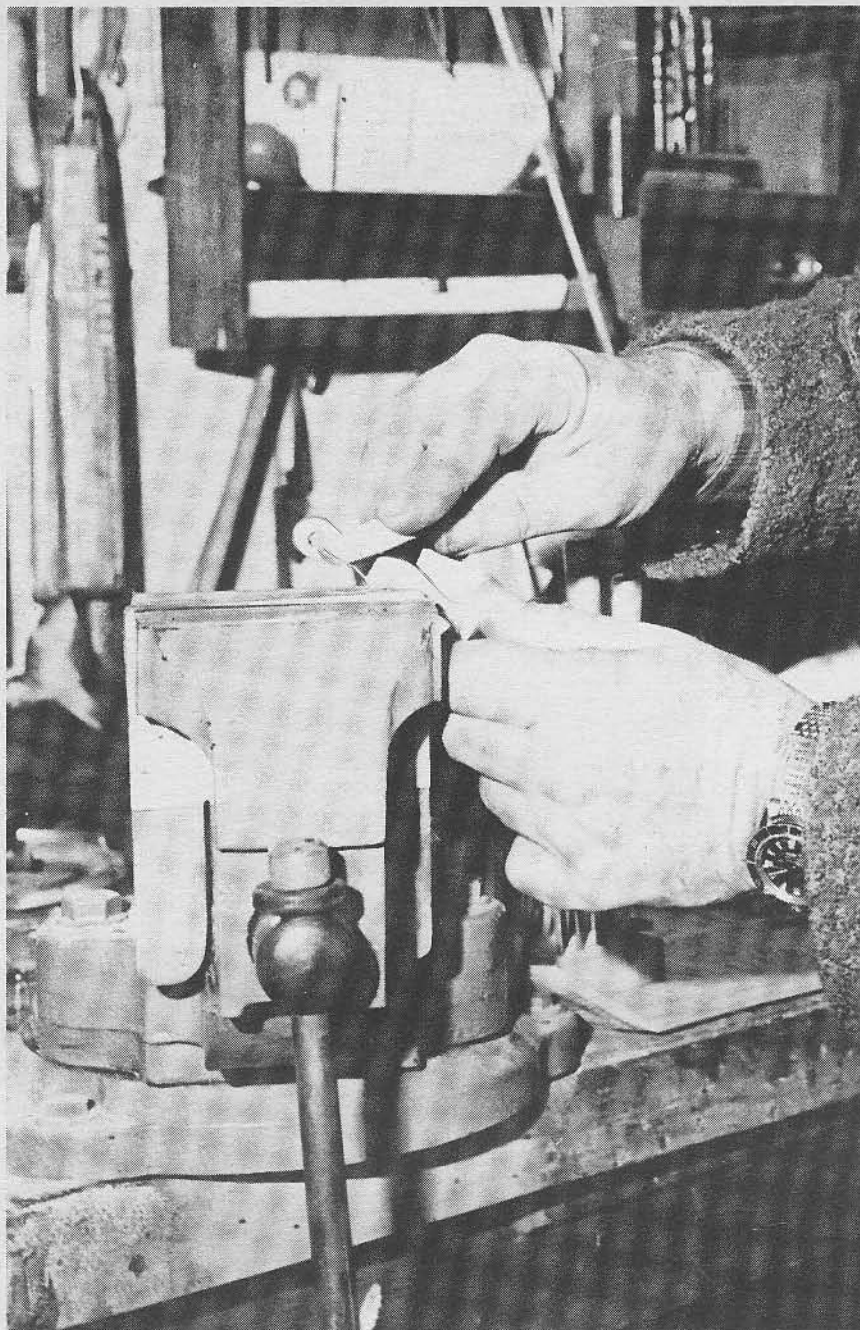
But regardless of origin, today only a few of the originals of these black powder firing "alarm clocks" of brass and

marble have survived the centuries. It is doubtful that one advanced arms collector in 10,000 has even seen one of the originals!

The purpose of the sun dial cannon was to fire a small charge of black powder by means of sun rays being directed through a small glass prism mounted directly over the touch hole in the cannon's breech. The exact purpose for which it was designed is unknown. However, through actual tests, I learned that this little gadget does work; the result of a little experimentation in placing the mounted

Left: The black powder sun dial cannon completed. (Right) Parts for the kit, when received from the maker, require assembly and finishing before the device is in fully ready to fire state.





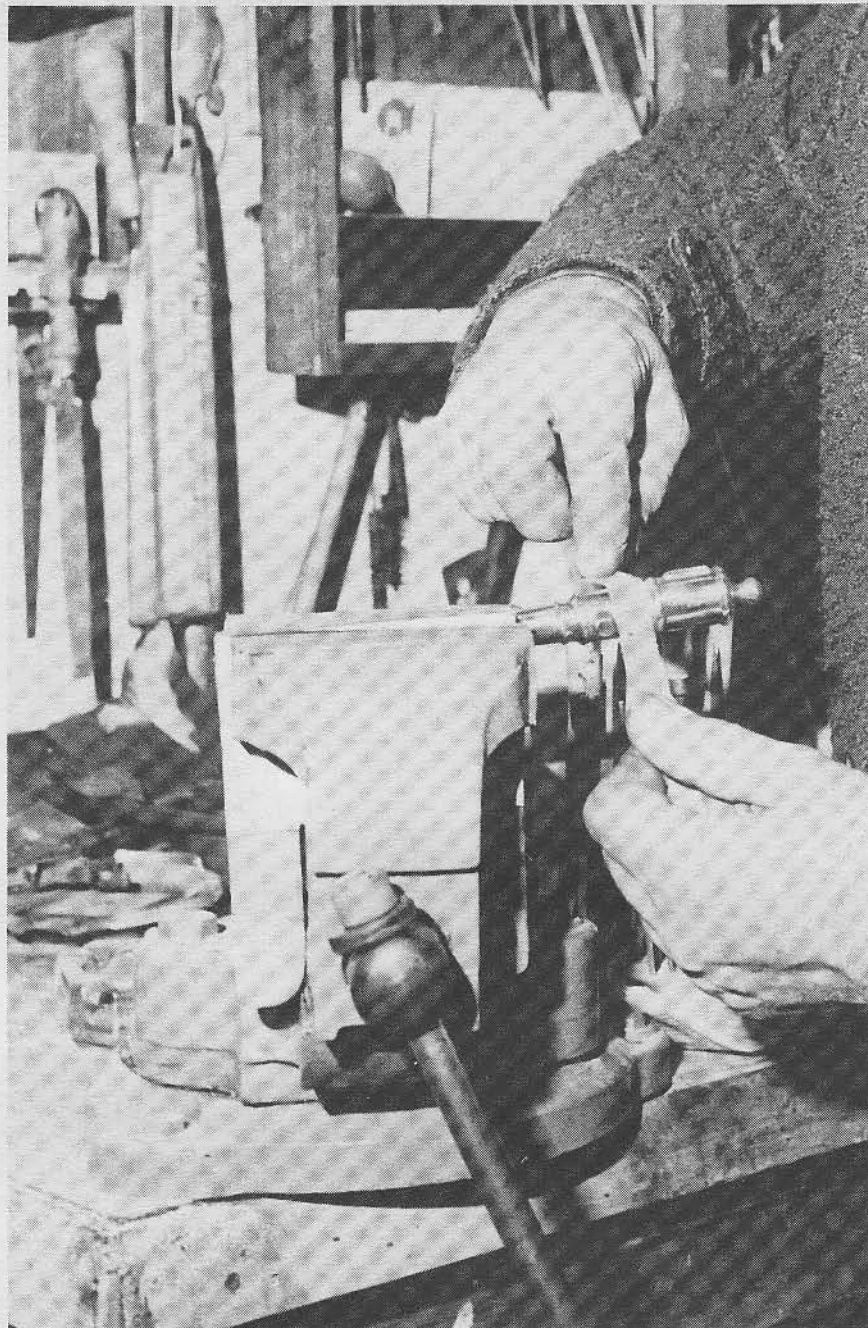
The mounting brackets were smoothed by hand, using files and emery cloth, taking great care to retain all of the original contours of the metal.

prism in exactly the correct position to catch the noon rays of the sun.

The sun's rays, concentrated through the prism, move slowly across the area of the dial until directed onto the priming charge. This black powder is held in a trough at the cannon's breech. The intense heat created by this pinpoint of sunlight ignites the priming powder and the little cannon erupts with a sharp explosion! In firing, the glass

prism becomes thoroughly smoked up, necessitating that it be cleaned after each firing.

A modern version of Galileo's sun dial cannon has been placed on the market as a finish-it-yourself kit by the Dixie Gun Works of Union City, Tennessee. Due to the popularity of these kits and low production by the manufacturer, they are usually in short supply at Dixie Gun Works. As a result, there may be some delay in delivery. I would



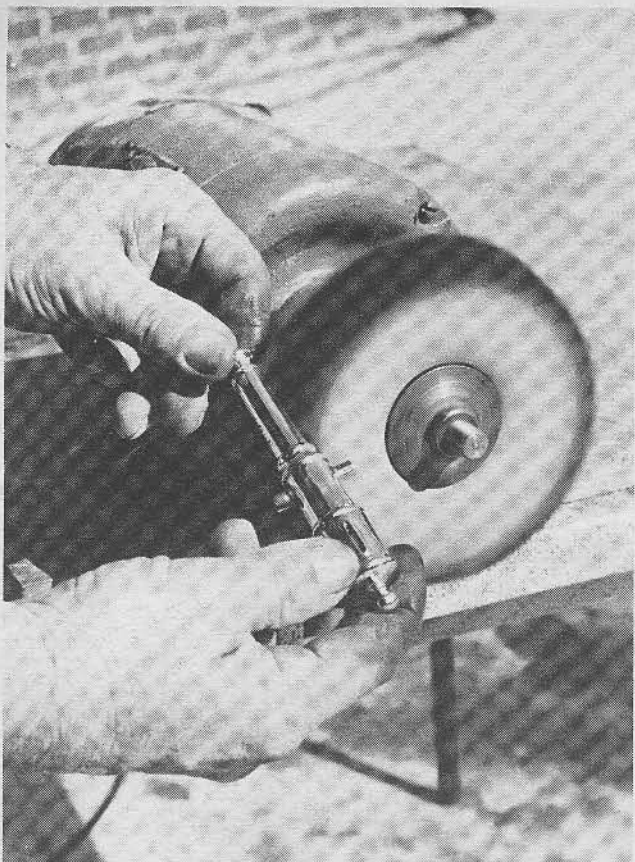
Detailing the miniature cannon barrel also is accomplished with files and final finishing with emery cloth strips. The castings were quite rough.

suggest that the prospective builder write Dixie concerning availability.

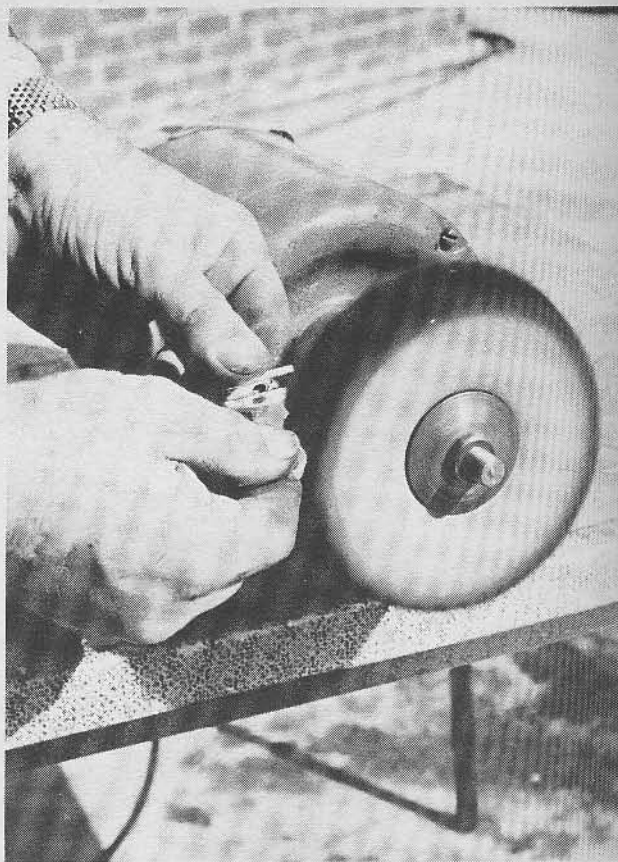
As received, the sun dial cannon consists of nine separate brass castings which must be smoothed and polished. These parts consist of the cannon barrel, its two mounting bases, the adjustable bases, arms and prism ring and the base to accept the precut gnomon of sheet brass. Also included in the kit is a circular marble-like base measuring

almost ten inches in diameter. This base is predrilled to accept the five assembly screws which hold the finished brass components. It is marked off in one-hour settings on its face. All screw holes are predrilled and threaded in the brass castings.

While all components of this kit are furnished in a somewhat rough, sand-cast finish, it is possible to smooth and give each part a high polish in a couple of hours. This is

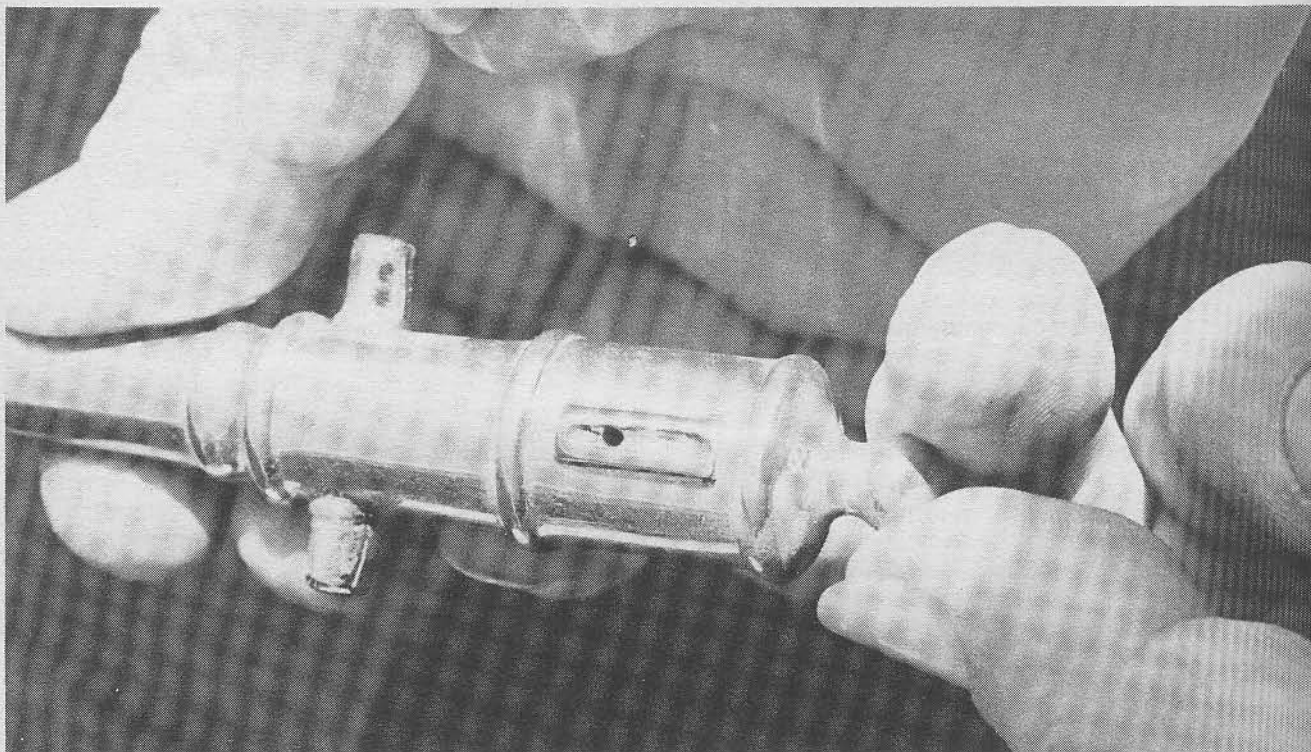


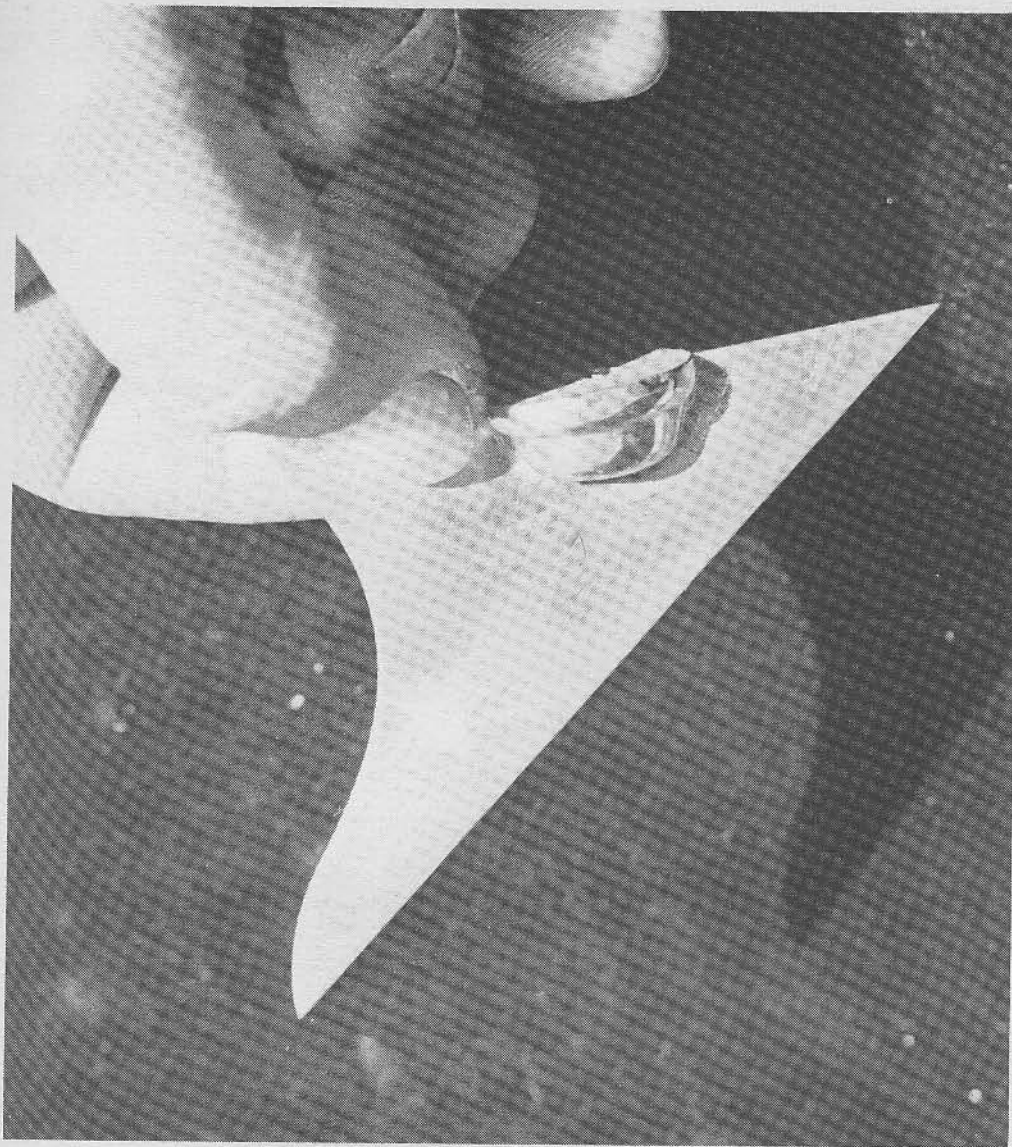
Buffing is another step in finishing. Care is taken to retain the contours.



Small parts such as mounting bracket must be buffed to remove all scratches.

The powder trough that is cast into the cannon's barrel to surround the touch hole should be finished by hand.





The gnomon and its base may be soft-soldered together, although base is cut for a slide fit.

accomplished by first dressing each component to reasonable smoothness with files, emery cloth and a disc sander. With the exterior roughness removed, each part then may be thoroughly buffed to a high polish. The first phase of buffing should be done on a muslin wheel using black emery buffing compound to remove completely any objectionable scratches. The final buffing should be done with a muslin wheel dressed with a white buffing compound that will give it a mirror-like finish.

As will be noted, all bases and legs supporting the cannon barrel and prism mounting have a definite contour and shape to them. These conformations should be retained in

the finished product if an attractive and worthwhile item is to be the end result.

It is best to finish one of these brass castings at a time; file, sand and polish it to a high luster, then go on to the next. The cannon barrel itself should receive special care and attention during the polishing stages. One could ruin the entire kit should this one component be loused up during the all-important polishing phase.

In finishing my own version of the sun dial cannon, I found that the best procedure was first to detail each component with a variety of metal files, then progress to a fine-grit emery cloth. The flat surfaces of all components may

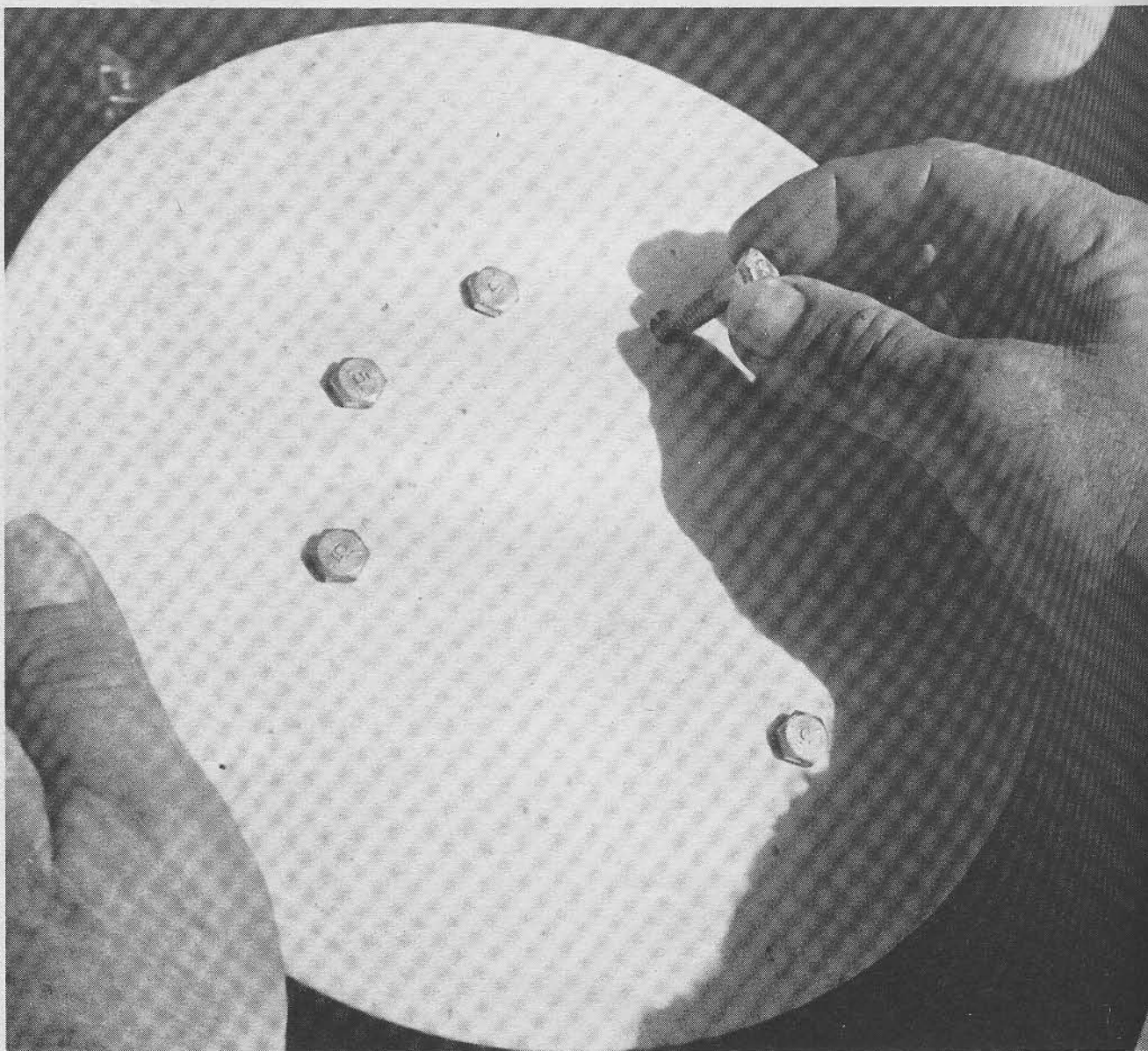
be smoothed quickly by running each across the face of a disc sander equipped with a fine-grit sanding disc. Following this, each part was buffed thoroughly as previously outlined.

A certain amount of fitting will be required to assure that each of the components sits squarely on the marble base. This applies principally to the cannon mounts and the prism bases. The rounded, contoured base holding the gnomon of sheet brass may require some work to assure

that the gnomon sits perfectly perpendicular to the base.

The detailing of the cannon barrel should be undertaken with a certain amount of precision, especially at the breech where is located the elongated priming powder trough. This powder trough is all important in the proper functioning of the finished sun dial. It measures about a half-inch in length, the bottom is perforated with the touch hole. In actual use, this trough is primed for its full length with 4F black powder, thus compensating to some extent for any

Five mounting screws are included with the kit. These are used to secure the finished components to the marble base.



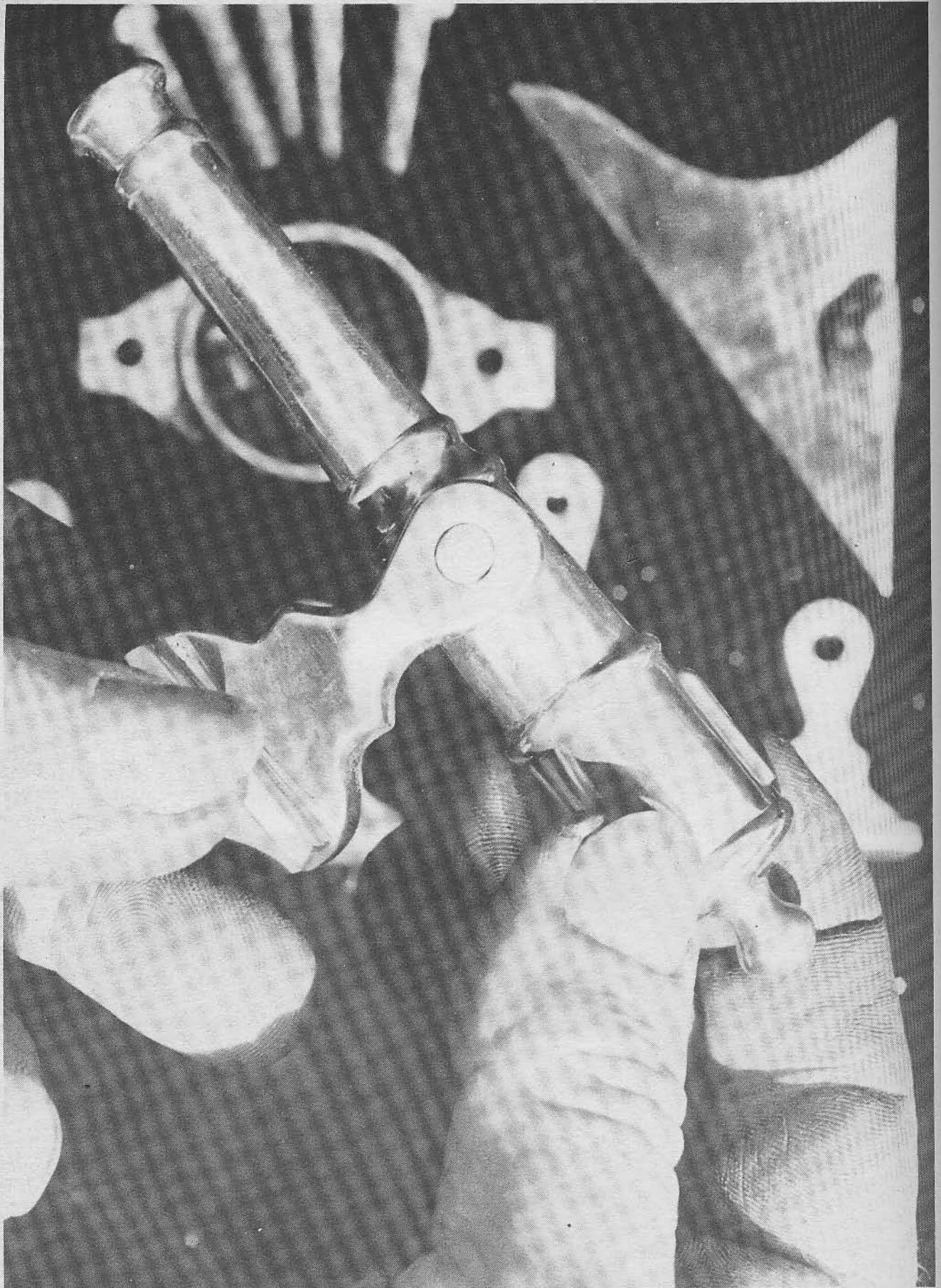


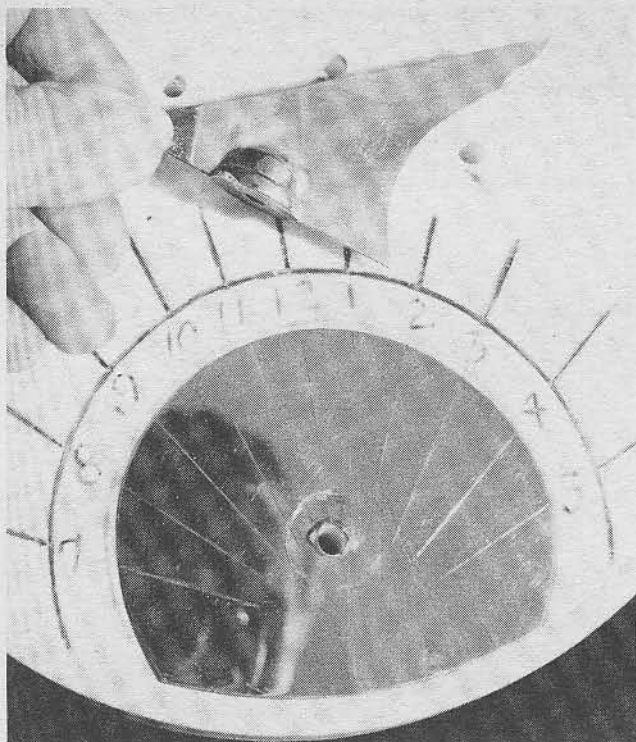
The parts of the prism base are assembled after they are polished. Mount must fit squarely to function.

variation in the sun's rays entering the prism. Regardless of where the small bead of magnified sunlight hits the powder primer in this trough, it is certain to ignite the black powder, thus firing the cannon.

The base of synthetic marble will require no work by the builder. The necessary holes for attaching the brass com-

ponents are predrilled, as stated. With the face of the base marked off in one-hour settings, one can give these markings more prominence by tracing each with a small camel hair brush dipped in either black paint or enamel, thus adding more definition to the dial face. Too, as a little extra addition to the appearance of the finished article, I formed





Left: Barrel mountings are fitted precisely to cannon's trunnions prior to final polish and assembly. One mount has a locking screw to hold barrel at a proper angle. (Above) Hour markings on marble base can be darkened with black paint or enamel. Brass plate with scribed markings was not included with kit; author added touch.

a brass plate, placing it under the gnomon, scribing the hour lines onto its surface. Correctly done, this addition to the basic kit adds greater eye appeal to the finished product.

When all brass parts are smoothed and highly polished, they are mounted in their respective positions on the marble base. The last to be screwed in place will be the prism mountings. When securely in place on the marble base, the precision-ground prism is inserted into the mortise in the mount and either epoxied in place or it may be held with a stiff, circular ring cut from a section of thin fiberboard or similar material, making it easy to remove for cleaning.

While the sun dial cannon may be placed on a permanent pedestal of some sort in the backyard or patio when completed, it must be calibrated carefully to the noon rays of the sun to correctly fulfill its intended function. This is accomplished by a little experimentation and adjustment to the angle of the prism in relation to the direction of the sun's rays. However, when I completed my personal version of this little oddity, it found a place in the living room of my home.

While the little cannon is completely functional, it was too unusual and attractive to subject to the vagaries of nature. I have plated mine with silver, using the plating kit as produced by the Texas Platers Supply of Dallas, Texas.

While silver plating adds a touch of elegance to the finished sun dial cannon, it renders it unsuitable to exposure to the elements due to the silver oxidization that will blacken the metal.

Bish makes the final adjustments in the cannon assembly before he secures the finished unit to sun dial plate.

