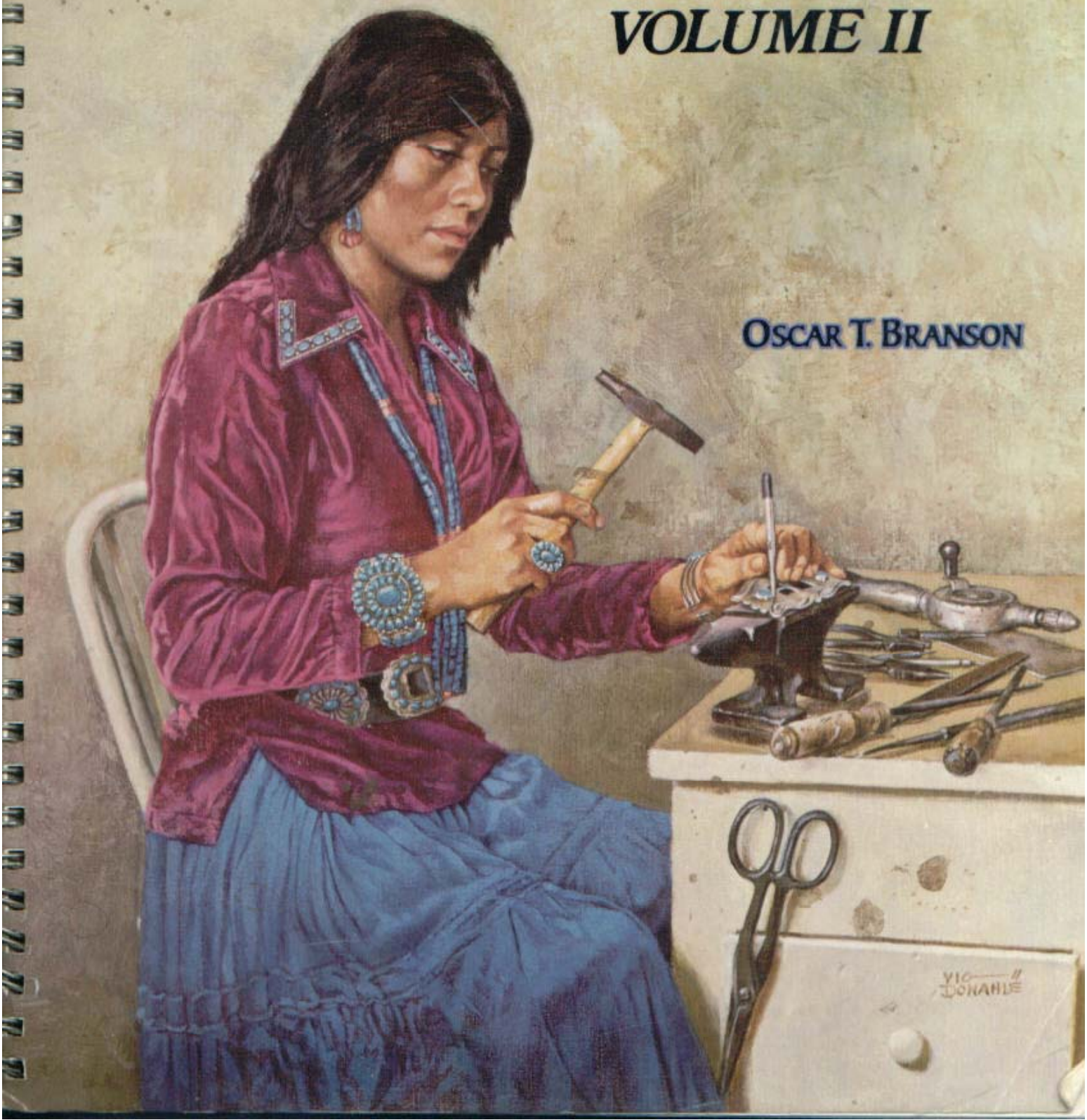
INDIAN JEWELRY MAKING

VOLUME II



OSCAR T. BRANSON

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INTRODUCTION

Southwestern Indian jewelry, a truly American art form, is becoming more popular around the world. The demand for INDIAN JEWELRY MAKING, Volume I -- 45,000 copies sold in eighteen months -- has inspired the writing and publication of Volume II. This book not only illustrates advanced silversmithing techniques, but also illustrates some of the easy projects which depict a part of the history of Indian silversmithing.

Many of the objects pictured in this book are not technically Indian jewelry. The originals were made by Indians, possibly at the request of clients or traders or as experiments by the silversmiths themselves. They are shown here with the hope that they will be used to develop new ideas and expand existing techniques. There are many one-of-a-kind examples of articles which could probably be copied and developed and could evolve into interesting and profitable projects. Some of these examples are the small silver sculptures of Kachinas and Indian figures, the silver cups and goblets, and the various types of boxes. The more contemporary Indian artisans are now being influenced by the designs of Ancient Egypt, the Orient, and South America, which they are combining with the Traditional to create the jewelry style of the future.

The working of gold is not included in this volume because gold is so much more expensive than silver for the individual silversmith, and the techniques for working it are more involved.

Ideally, all the work of individual artists would be marked by a signature, stamp or an identifying symbol.

Many of the projects illustrated here are based on examples of truly traditional items, but, tradition must relinquish the way to progress!

DEDICATION

This book is dedicated to the many Indian silversmiths, good and bad, living and dead, who have ever practiced the art of silversmithing, whose signed and unsigned works, many of which are pictured here, are appreciated, enjoyed and sought after by innumerable admirers.

This book is also dedicated to the many people who helped me to make it a reality -- especially Richard Barrett II, a master craftsman, who was instrumental in constructing and completing many of the very difficult projects pictured here; and Connie Asch, silversmith, artist, and very patient person, whose humor made the work enjoyable. Last and most important, this book is dedicated to the silversmith who will use it and the ideas and techniques presented here to expand his knowledge and increase his skill.

NOTE TO THE READER

The silversmith working many miles from supply houses uses whatever tools he has and improvises to make the simple tools he needs. This ingenuity is one of the reasons this great craft is alive and well today. It is surprising to discover that some of the home-made tools are the best and most-used tools a silversmith possesses.

In several projects illustrated in this book pieces of silver were fashioned into particular shapes by bending or forming them around strips of black wrought iron or "strap iron", usually six to eight inches long of varying thicknesses. Large bolts, the heads of which have been filed into shape to make forming tools are usually hammered into a wooden block to complete the die.

One Indian silversmith, instead of sawing out the many hundreds of scalloped edges around a belt concha, saved himself a great deal of time and work by making a crescent shaped cutting chisel to shear off the excess silver around the edges. It is said, "Necessity is the Mother of Invention". The improvising and making of certain home-made tools should be encouraged among the silversmiths and craftsmen. Numerous wooden and iron tools were devised to complete many of the projects in this book.

A small portable sheet metal worker's punch, such as the Whitney-Jensen No. 5 with a set of punches ranging from 3/32nds of an inch to 9/32nds of an inch, is an extremely useful tool for the silversmith. Small holes can be quickly and easily punched in thin metal more perfectly than they can be drilled. It is particularly useful when making a hole to insert a jeweler's saw blade for sawing.

All the soldering was done with Leach and Garner's No. 55 solder (medium flow) with a 1325° F melting point; and Handy and Harman's Handy Flux was used exclusively. This solder was used successfully regardless of the number of times an article was soldered.

The word "solder" as it is used in this book refers to silver solder, not to lead or soft solder. Silver solder is a mixture of pure silver, copper and zinc, but never lead. Even a small amount of lead accidentally mixed with silver renders the silver unworkable. This contaminated silver should be sent to a refiner -- it should not be used in casting. Any lead solder put into the acid pickle will contaminate the acid.

Kirksite, referred to in this book, is an alloy of zinc and other metals used extensively in industry to make non-deforming molds to form or shape other metals. It has a melting point of approximately 800° F and can be poured into dry plaster or investment molds to make forming dies. It can be obtained from: Morris P. Kirk and Son, 2700 South Indiana Street, Los Angeles, CA 80023.

The lead which was used for dies pictured in these projects is melted down old automobile wheel balance weights.

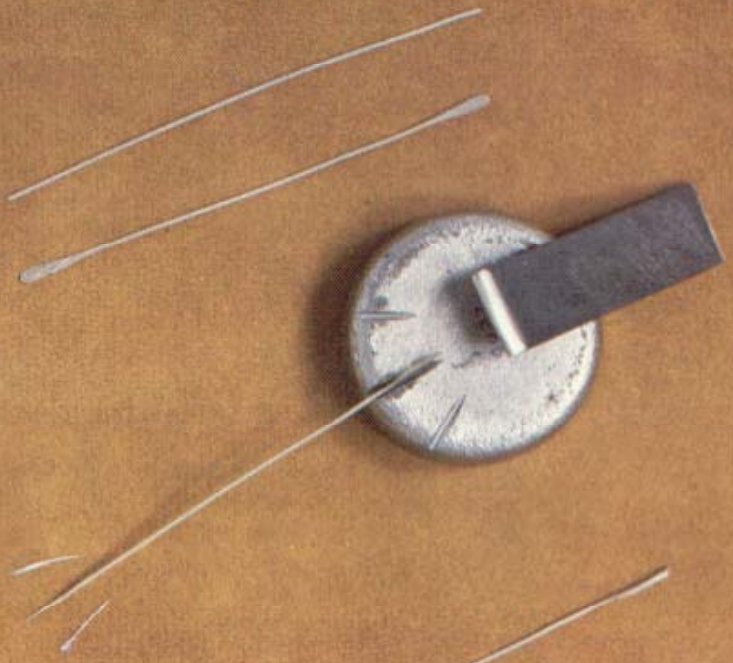
OLD STYLE NAVAJO EARRING

This old style earring has almost disappeared from the reservation. It was usually a man's earring. The first ear wires were very large and irregular,being hand beaten from coins. The later ones were thinner and smooth, having been drawn through dies. A pair of old silver beads was a very popular addition on the loops as was a matching tab of turquoise, abalone or red shell. Often a pair of silver squash blossoms was used.

A pair of prehistoric turquoise tab earrings probably attached to the ear by yucca fiber or native cotton strings

Early Navajo coin-silver earrings with old worn beads on very large diameter hammered ear wires

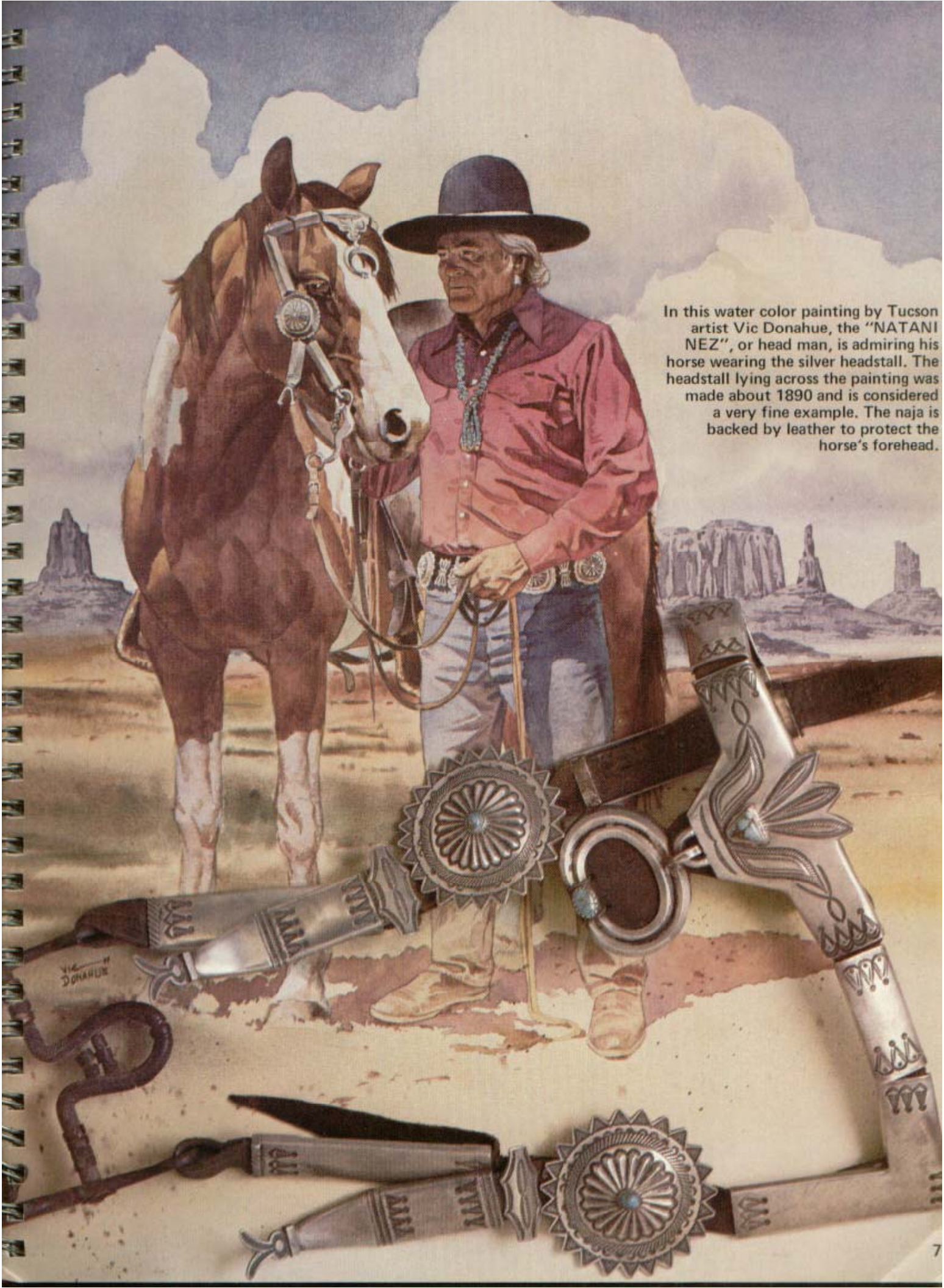
The main conponents for these earrings are two 16 gauge pieces of silver wire slightly less than 6 inches long. Both ends are flattened and one end pointed by trimming off slices of silver to make a point. The other end is grooved to hold the pointed end.
A good way to form a groove is to grind a piece of flat file to a slightly rounded end and hammer into a lead block. The flattened end is then hammered into the groove with the rounded end of the file.



The ear wires are then filed smooth and polished. They are then bent around the large end of a ring mandrel.

These earrings are almost the exact design of the early Spanish earrings which the Indians of the Northern Rio Grande Pueblos copied.

They are made of a flat piece of thin 28 gauge silver sheet, domed and trimmed like a half bead. A number of pieces of flat silver wire are bent in a variety of shapes and all soldered together, filagree fashion.



In this water color painting by Tucson artist Vic Donahue, the "NATANI NEZ", or head man, is admiring his horse wearing the silver headstall. The headstall lying across the painting was made about 1890 and is considered a very fine example. The naja is backed by leather to protect the horse's forehead.

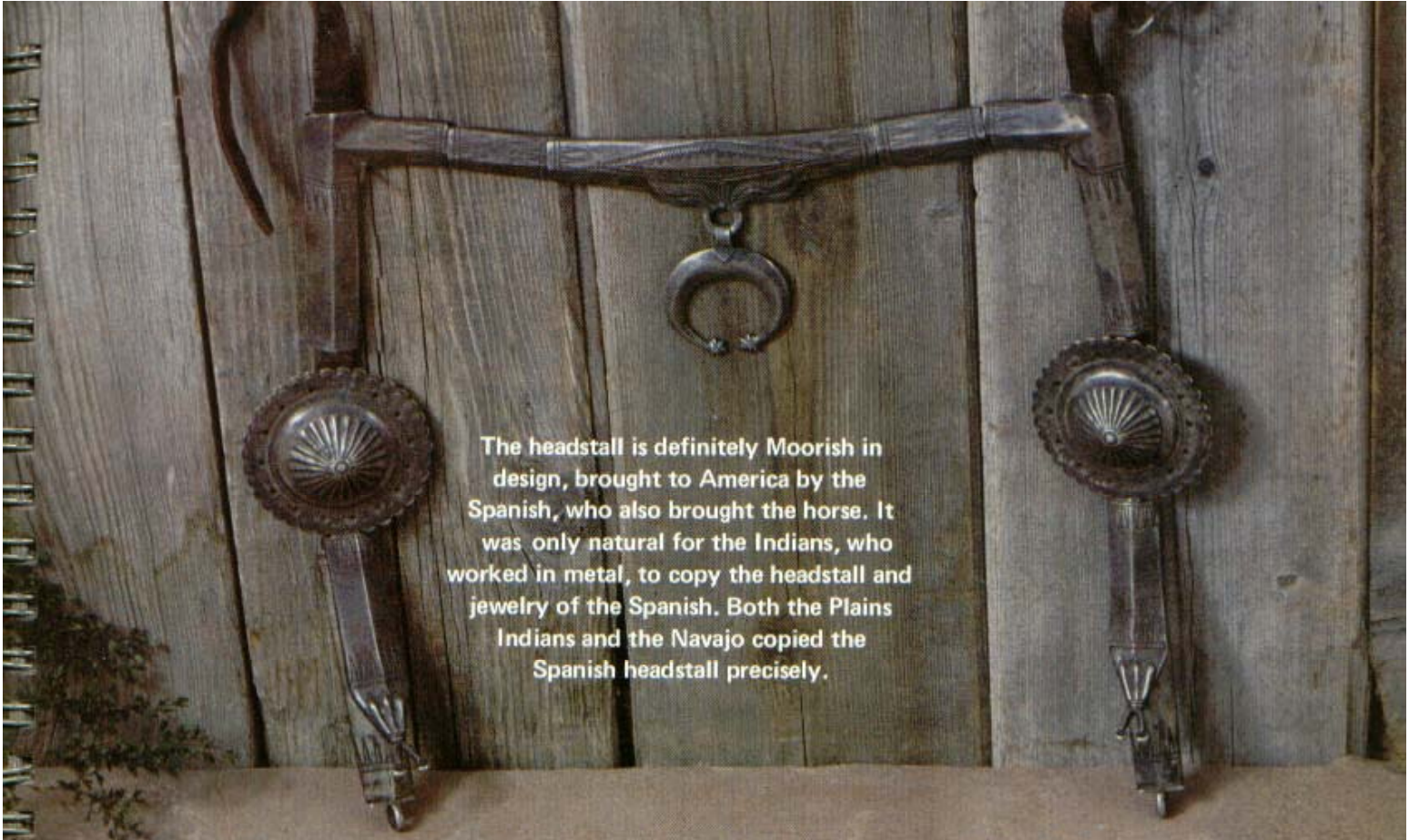
THE SILVER HEADSTALL OR BRIDLE

One of the proudest possesssions of the nomadic Navajo was the silver headstall for his beloved horse. Very rarely is one seen in use today and then only at sings or dances in remote parts of the reservation. Hundreds of these headstalls and possibly tons of silver jewelry are buried across the reservation with their owners. What a rich legacy to the archaeologists of the future!

This bridle is made of 18 gauge silver sheet. It consists of 11 pieces plus the naja, and weighs about 18 oz. Troy, or a little more than a pound. The straps are usually made of 3/4-inch leather. It is convenient to use a 6-inch piece of 3/4 x 1/8 inch black strap iron over which to form the silver to fit the leather strap. The pieces of silver are cut to size as shown and decorated by stamping before they are bent in a vise around the strap iron, forming a channel for the leather.

Pieces of copper strip 1/4 x 7/8-inch are cut, and two are soldered to the back of each piece of silver. Heavy silver rings of 7 gauge round silver wire 5/8 inch in diameter are soldered perpendicularly onto the bottom of the final piece. Small copper rings are soldered to the back of the lower pieces to secure the leather

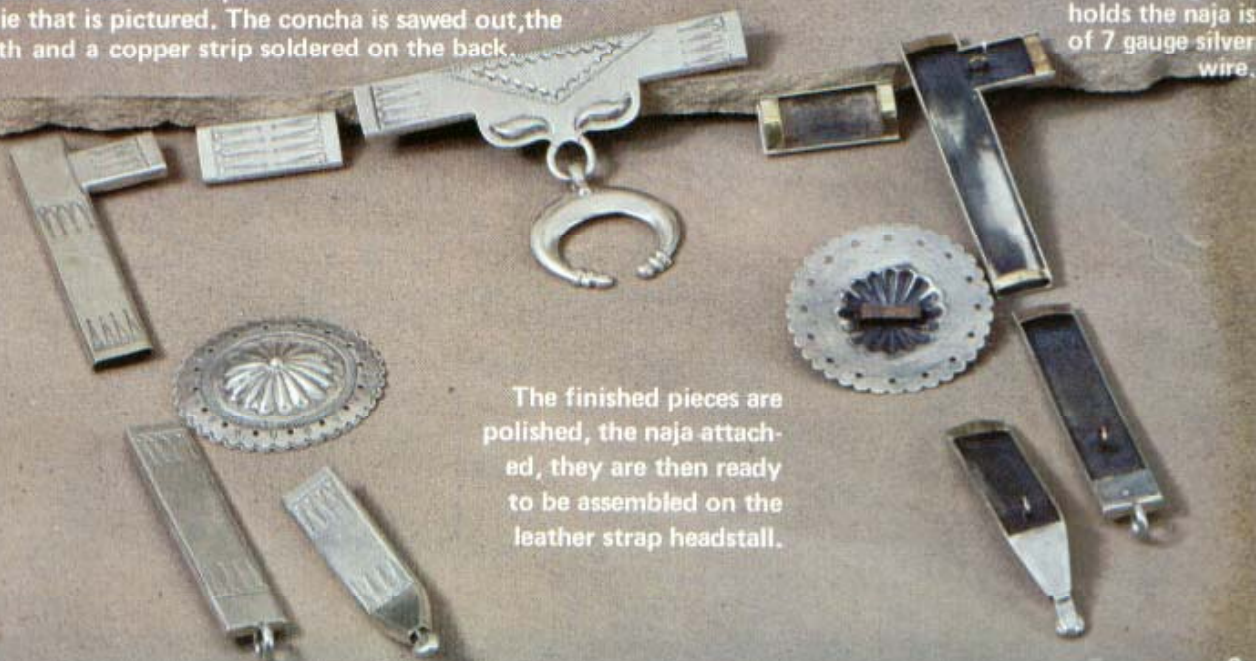
A piece of 3/4-inch strap iron is ground to a point as shown. It is used to shape the guard pieces which are slightly curved after soldering.



The headstall is definitely Moorish in design, brought to America by the Spanish, who also brought the horse. It was only natural for the Indians, who worked in metal, to copy the headstall and jewelry of the Spanish. Both the Plains Indians and the Navajo copied the Spanish headstall precisely.

The round concha cheek pieces are stamped in a male or female die and decorated. A small button is stamped in the center of the concha using the other die that is pictured. The concha is sawed out, the edges filed smooth and a copper strip soldered on the back.

The center piece that holds the naja is decorated with stamping, and two bicurvate designs are made with the dies shown. The silver ring that holds the naja is of 7 gauge silver wire.



The finished pieces are polished, the naja attached, they are then ready to be assembled on the leather strap headstall.

The Tweezer or Whisker puller is a very old personal article used by the Indians of the Americas. Its use is mentioned in writings of many of the first explorers of North and South America. Due to the fact that the Indians have sparse facial hair, an easy, if somewhat painful, method was used to extract it. Iron and steel were unknown in the Americas before Columbus arrived and shaving with sharp stones, shells or other objects was not widely practiced. Few Indians found it convenient to shave even after the steel razor was introduced. They considered it much easier to extract their facial hairs at various times during the day with a pair of homemade tweezers.

Felix Valencia

TWEEZERS OR WHISKER PULLERS

The Indians of the Americas probably used a tweezer made of the two halves of a small shell instead of a razor. The two halves of a bivalve mussel were tied loosely together through holes punched in the hinge end. The edges were scraped flat so as to grasp the hair like pincers and extract the whiskers. Many of these primitive shell tweezers have been excavated from early burial sites.

Primitive shell tweezers like these were found in many Indian burial sites

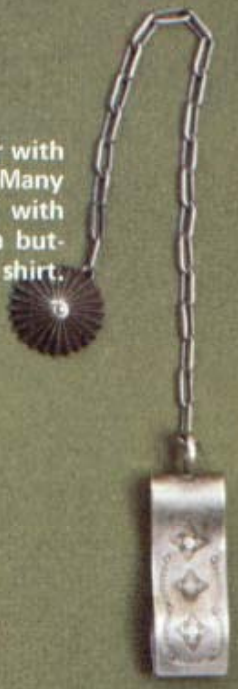
Deer antler tweezer bound with thong

An Apache tweezer of German (nickel) silver

The pattern for a one piece rocker engraved design tweezer, made from 24 gauge nickel silver or brass. A hole punched in the center serves to attach a thong or chain after bending. It is filed to make the matching edges mesh.

Navajo brass tweezer with Indian service button and part of old watch key

Old silver Navajo tweezer with silver chain and button. Many times these were carried with the button inserted in a buttonhole of a coat or shirt.



An ingenious Navajo tweezer made from a double section of steel packing case strap, taking advantage of the already clinched fastener.

A two piece tweezer of silver put together with a copper harness rivet and bow bent in the center to form a pincer. The turquoise tab serves as a button.

An old Pueblo tweezer made from an "Arbuckle's Coffee" can.

Hopi vase

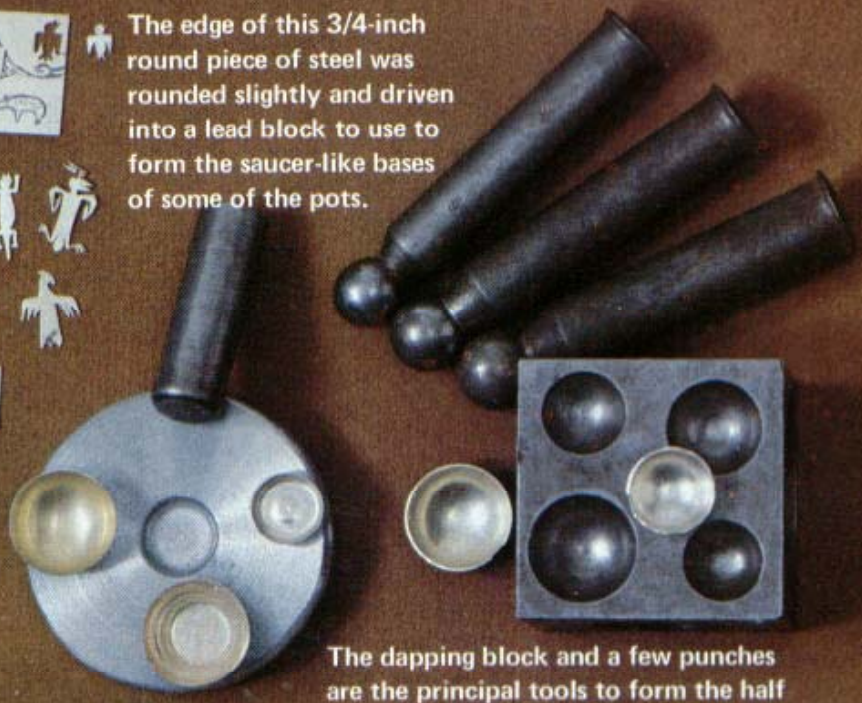
MINIATURE SILVER POTTERY

Southwestern Pueblo Indian pottery is one of the most beautiful and fascinating art forms available today. The miniatures are no less than precious and the silver copies can be real gems. All the examples shown here are copies from distinctive pottery types, both historic and prehistoric. They are all made from a single gauge or thickness of silver. Most of the decorations are sawed from small pieces of scrap. They are all easily made and are much fun to produce. The only tools used in their manufacture are the ones shown, plus the jeweler's saw. The only difficult operation is the soldering, but with some skill and great care it is easily accomplished.

These are the basic component forms or shapes that make up most of the miniature pots shown on these pages. The way they are cut and assembled determines the type of pot.

The edge of this 3/4-inch round piece of steel was rounded slightly and driven into a lead block to use to form the saucer-like bases of some of the pots.

Pottery designs are sawed from 26 gauge silver scrap. They are applied by using the granular silver solder techniques.



The dapping block and a few punches are the principal tools to form the half spheres.

Tiny copies of Mimbres bowls

Hopi vase

Santa Clara water jar decorated with bear paw print

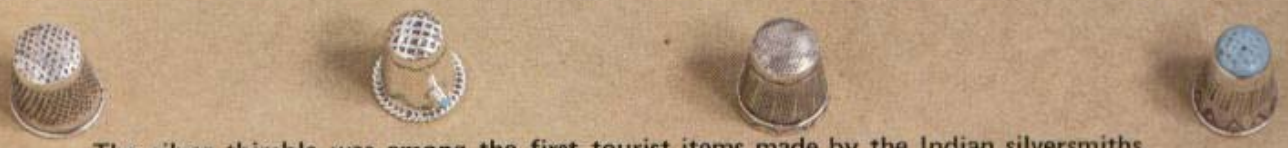
Santa Clara wedding jug

Hopi water jug

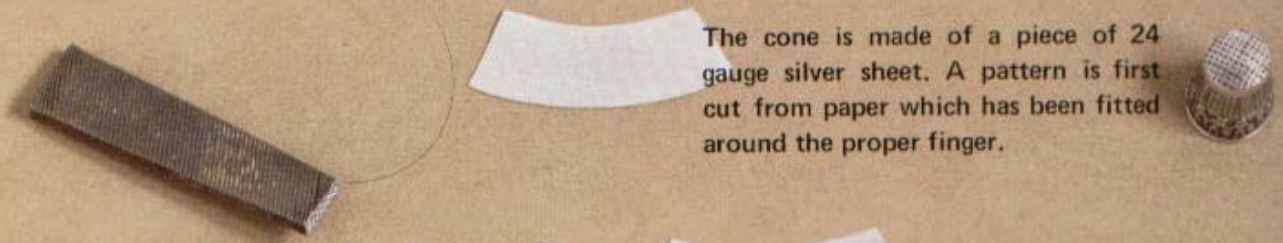
The progressive steps in making a San Ildefonso carved serpent design jar. The hardened steel bolt was used to hammer inside the half sphere to flatten the bottom.

The Mesa Verde mug and the cutouts to show how the design was made.

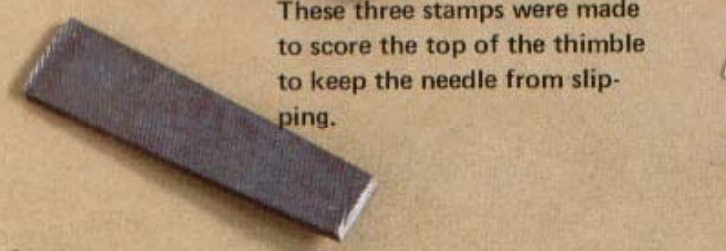
THE SILVER THIMBLE



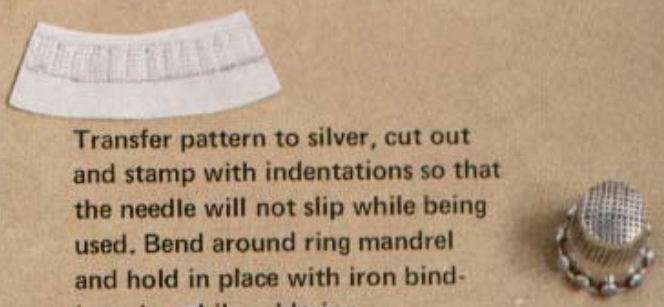
The silver thimble was among the first tourist items made by the Indian silversmiths. It was easy to make, took very little silver, and could be sold at a reasonable price. It became popular as an inexpensive gift at a time when many housewives were doing their sewing and mending by hand.



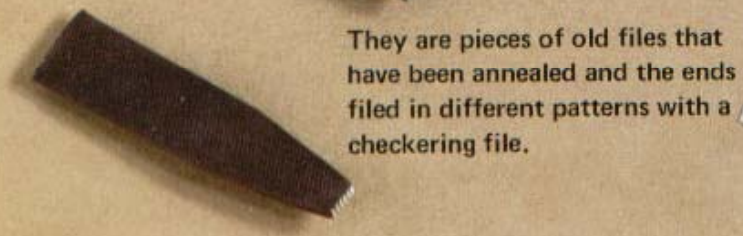
The cone is made of a piece of 24 gauge silver sheet. A pattern is first cut from paper which has been fitted around the proper finger.



These three stamps were made to score the top of the thimble to keep the needle from slipping.



Transfer pattern to silver, cut out and stamp with indentations so that the needle will not slip while being used. Bend around ring mandrel and hold in place with iron binding wire while soldering.

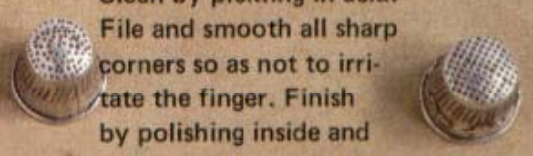


They are pieces of old files that have been annealed and the ends filed in different patterns with a checkering file.

Try on the finger for the proper fit. A ring of 16 gauge round wire is made to fit on the bottom and soldered into place.

This is the simplest of all silver punches, a nail set that has been rounded to make small dents in the end of the thimble like the punches above.

A disk of 20 gauge silver is cut slightly larger than the top of the cone. Stamp with indentations, dome on wood block, then solder onto top of cone.



Clean by pickling in acid. File and smooth all sharp corners so as not to irritate the finger. Finish by polishing inside and out.

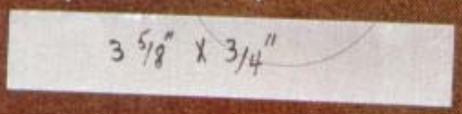
THE POLICE WHISTLE

This whistle with a star overlaid on top, was used by a Navajo policeman about 1915.

The police whistle was adopted very readily by the early Navajo police, and was considered as necessary as the badge and the gun. It was one of the many items the Navajo silversmith made to substitute for or replace a white-man manufactured article. These old whistles are indeed rare as there were very few Navajo police.

A Zuni turquoise inlay design of the 1940's

Four pieces of 24 gauge silver sheet are cut to shape. Two are stamped with an appropriate design for the sides, one for the top.



The longest piece is bent around a ring mandrel to form the air cavity.

Turquoise stones were used to decorate the sides of this whistle.

The bent piece is soldered between the two sides and trimmed. The top stamped plate is soldered on to complete the mouthpiece.

The position of the mouthpiece- which directs the air flow- in relation to the top edge of the air cavity, determines the pitch of the sound. The top edge of the circular piece should just slice the air flow from the mouth piece. The thinner the slice of air the higher the pitch. The opening at the top should be about one-fourth inch wide.

A Hopi style overlay design

A ladies' commercial "HELP!" whistle, inexpensive and very efficient.

A silver ring made of about 10 gauge round wire is soldered on opposite the mouthpiece. The whistle is then filed, darkened and polished.

A pea size piece of cork is cut round, wet, compressed and inserted into the air cavity to cause flutter.

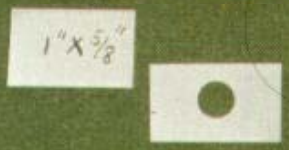
A pair of buttons is used for the sides of this whistle

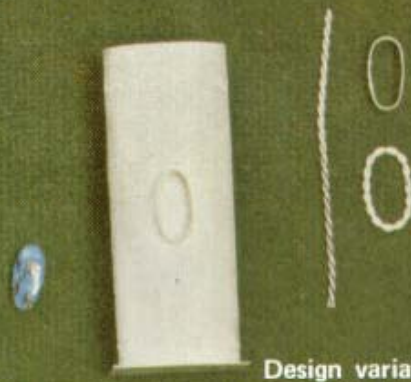
THE CIGARETTE LIGHTER CASE

A discarded lighter body makes an ideal mandrel.

The silver cigarette case for the disposable propane lighter is a rather recent item for the silversmith. Decorated cases were also popular a number of years ago for the old cotton wick naphtha lighter.

An attractively decorated lighter case with coral, turquoise and appliqué leaves





A sheet of 26 gauge silver of the correct size for the particular lighter is decorated with a stamped border and bent around a discarded lighter body. Black iron binding wire is used to hold it in place while soldering. A silver base is cut and perforated before soldering on to the bottom. The perforation is for pushing the empty lighter out for discarding. Stones are selected, bezels are made for them and soldered on with twisted wire or other decorations such as leaves, etc. The stones are set, lighter antiqued and polished.

Design variations for a lighter case seem to be infinite. Plain, stamped, engraved, initialed, with stones, flowers, leaves or any combination of decorations can be attractive.

A disposable lighter, with slip-on silver jacket, for coffee table use

Pictured here are only a few of the many lighters that can be encased in silver.

Special oval tubing is now available to fit the Zippo lighter body. Only the decoration needs to be soldered on to the sides.

One of the most sought after items of tourist silver is the silver bell, which was seldom made and is therefore scarce. These were made only on order or request from a client or trader. Few silversmiths have ever experienced making this item.

Old Navajo Bell

Bell made for a Catholic Priest

A paper pattern is made to form a cone. The size can vary. The piece to form the body of the bell is made of silver sheet of at least 18 gauge thickness. The silver is then stamped and bent in the shape of a cone and soldered. The shaping can be done over a ring mandrel.

Navajo bell of the 1930's

Zuni bell with carved turquoise figure

A circle of 18 gauge silver, slightly larger than the top, is cut and domed. Two holes are drilled near the center of the dome. A piece of 16 gauge silver wire is bent into a "U" shape and soldered through the holes to form a ring to hold the clapper. The dome is then soldered onto the top of the cone and the edge filed smooth.

The handle is made of a piece of 20 gauge silver sheet formed around a small bezel mandrel, fastened with iron binding wire and soldered.

Navajo bell of a 1940's Spanish lady

The clapper is made by melting brass scrap into a ball and soldering to it a 2-inch piece of 14 gauge brass wire. Bend the wire into a small loop near the ball. Bend the remaining length of wire into an "S" shaped link for hanging inside the bell.

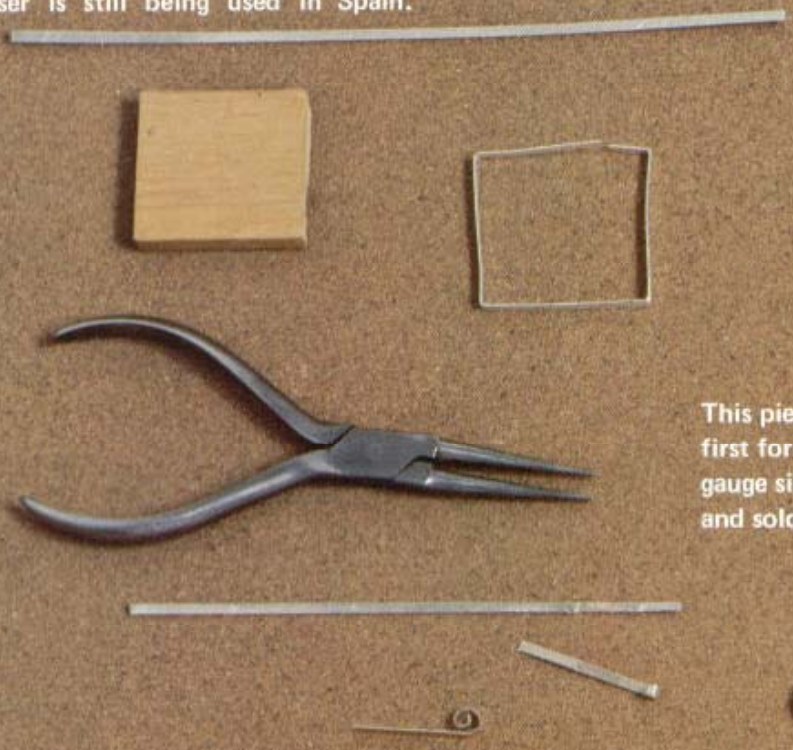
A small perforated silver disk is soldered 1/8 inch inside the top, or larger end of the handle, making the end of the handle form the bezel for the stone.

The small end is soldered to the center of the dome. The bell is pickled, the stone is set and the bell polished. The clapper is added last.

GRANULAR SILVER SOLDERING TECHNIQUE

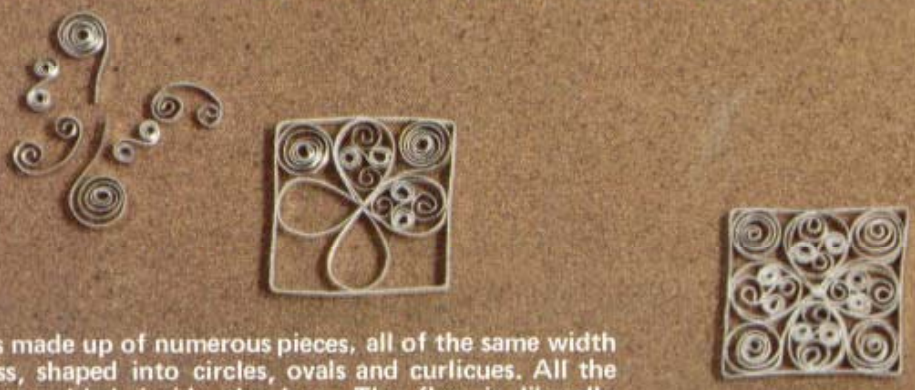
Granular soldering is a technique which was used on both silver and gold as early as 700 B.C. and which enabled the Greeks to make some of the world's most beautiful jewelry. This soldering method was brought to Spain by the Moors, to Mexico and the Navajos by the Spanish. This process of melting a silver peso with half as much cartridge brass, and pounding or filing off bits of the slug to use as solder solved a very important problem for the Navajo- the problem of soldering. Now that high quality, reliable sheet and wire silver is readily available, and because so much time and effort is required to produce homemade silver solder, the procedure is all but forgotten and in danger of being lost forever. In fact, most modern silversmiths have never even heard of it. It is illustrated here because it is an important step in the history of Indian jewelry making.

Small Spanish-style granular silver solder dispenser made from two old brass shotgun shell case tops. It is fitted with a small hollow nozzle, notched for vibrating a fine stream of solder filings on filigree work. This is accomplished by holding the dispenser over the work that has been fluxed, and scraping across the notches with a fingernail. This same type dispenser is still being used in Spain.



This piece of filigree was constructed by first forming a 1/8-inch wide strip of 24 gauge silver around a wooden pattern and soldering the ends.

Filigree jewelry was made by only a few of the Indians of the northern New Mexico Pueblos, then only under the direction of the Spanish or Mexican silversmith. The great amount of time consuming work required to make it, and the small income derived from it, did not appeal to the silversmith. The fragility and lightness of weight did not appeal to the Indian. Filigree was truly of Spanish origin.



The design is made up of numerous pieces, all of the same width and thickness, shaped into circles, ovals and curlicues. All the pieces are assembled inside the box. The flux is liberally applied, solder is sprinkled over the entire assembly and it is carefully heated and soldered.

Note the handle made of "plumber's strap" to hold the crucible for pouring melted silver.

A cast slug of silver solder

Pour into a soot-blackened tufa or investment mold to form a slug of silver solder, about I inch wide and 3/16 inch thick.

To one ounce of melted sterling silver scrap add ½ ounce of brass scraps. Use plenty of borax flux. Beware of breathing the white zinc oxide fumes from the melting brass. Wear a dust mask for protection. Stir well with a piece of coat hanger wire and pour immediately after metal is thoroughly melted and mixed. Do not overheat.

This is one ounce of Sterling silver scrap and ½ ounce of brass scrap. The brass can be welding rod, cartridge cases (remove primer), or clock brass (best).

The slug of homemade solder is held securely in a vise and filed with a medium coarse file to obtain a quantity of silver solder filings.

A powerful magnet is used to extract tiny iron chips caused by filing. If not taken out of granular solder, iron chips will cause problems when soldering.

One of the best ways to solder tiny overlay designs, leaves, flowers or figures, to a heavy background or plate, is to dip the figure in, or paint on, a coating of thick flux. Sprinkle the granular solder onto the flux. Thick flux will adhere to the back of the figure, and the granular solder will stick to it. Water-thin flux will run off.

Tiny figure is dipped in thick flux (Handy Flux) and laid face down on the asbestos block.

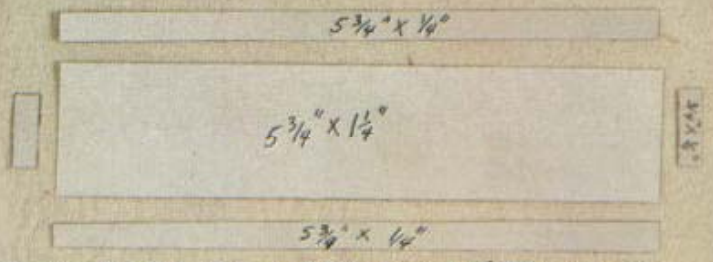
The figure is sprinkled with granular solder.

Figure is heated to melt flux and solder, coating back of figure with solder.

Figure is placed in position on base and reheated, welding it firmly to the plate.

The figure is then heated to melt the flux and solder, coating the back of the figure with solder. Remove heat. Turn figure over onto plate in proper place. Add a little more flux and heat plate almost to melting point of solder before much heat is directed towards tiny figure. When the melting point of the solder is reached, the solder will flow just to the edge of the figure.

The Buffalo Hunt
belt buckle



This bracelet is made up of four pieces of 20 gauge silver sheet soldered onto a back of 18 gauge silver. This makes a frame to hold the story cut-outs.

The characters for the story are first drawn on scrap pieces of 20 gauge silver sheet using a fine marking pen. They are then cut out with a jeweler's saw, assembled in the frame and soldered into place.

Going to Shiprock

There are innumerable ideas and designs for stories for this type of jewelry. Bracelets, necklaces, pendants, buckles and even boxes can be used to tell a story.

Trying to Break a Wild Horse

Mudhead Capers

The Deer Hunt
pendant

Making Camp

The overlay story bracelet is a modern concept of an old idea. The rocker engraved and stamped story bracelet was probably introduced into the southwest by the Kiowa-Comanche before 1900. Only a few of these stamped and engraved bracelets were made by both the Navajo and Hopi during the next 50 years. The overlay technique, as developed by the Hopi, is the ideal manner in which to express this interesting idea. Articles depicting a story, or an idea, are now being made in a number of mediums. Some are stamped, or overlaid or inlaid with turquoise or other stones or combinations of all. Even gold overlay is being used.

The Rabbit Hunt belt buckle

Catching The Horses For A Ride

Navajo Squaw Dance

A story ring can be used to depict some very personal happenings or remembrances from a friend or a loved one. The widest one below pictures a kachina dance.

Encountering A Skunk

A story ring is made in a similar manner as the bracelet. The story characters are sawed out and soldered on after a border of halfround wire is soldered to the edges of a strip of 20 gauge silver sheet. The ring is then shaped on a ring mandrel and held together with iron binding wire while it is soldered.

Hawk After A Rabbit

Rainstorm At Shiprock

A Cyclone

A finished bracelet after being shaped over a braclet mandrel with the aid of a rawhide mallet, then finished by polishing.

The Story Teller belt buckle

ROCKER OR FILE ENGRAVING

Old Kiowa-Comanche nickel silver button

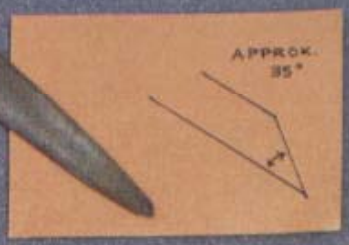
Rocker engraved bracelet

Rocker engraving or file engraving was the most popular method of decorating silver used by the Eastern and Great Plains Indians. Examples were traded to the Southwestern Indians and much was taken as plunder. There were a few silversmiths who practiced the art, but it did not gain popularity in the Southwest.

The name for this type of decoration comes from the action which produces the engraving. It is a rocking-like motion of the wrist, walking the chisel-like point of the graver slightly pressed into the metal, cutting out tiny slivers of metal to form a line or design. The rocking-like motion, also directed forward, produces a zig-zag line somewhat resembling the "herringbone" prints left in the snow by a skier walking uphill. The engraving tool can be a file, awl or a commercially made engraver. Like a file, it must be made from a very hard metal. It should be sharpened to a chisel point of about 30 to 40 degrees, and as wide as the line desired. The engraving job is made easier if the point of the tool is kept very sharp by rubbing it often on a fine emery or oil stone. The engraver should be held much like a piece of chalk, but with the handle nesting in the palm of the hand so that more pressure can be easily exerted on the metal. A file engraved decoration on a piece of jewelry is different from a filed decoration. The engraving is done with the sharpened end of a file, the filing is done with the flat working edge of a triangle file. A triangle file is used to score or cut the design, which is composed of notches around the edge, or of grooves for an almost sculptured effect filed into the slightly rounded surface.

Old button made from a coin silver watch case with rocker engraving and old ear tab

Early engraving tools were usually old files ground to a chisel point and used without handles.



These three lines illustrate the results obtained when rocking the engraver slower or faster. The faster the rocking motion, the more solid the line becomes.

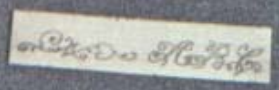
Cross made from a hammered out coin

Old Kiowa-Comanche buttons acquired by trading, or taken by Ute Indian raiding parties

Examples of four engravers of different widths and the results of each

A commercial engraver

Examples of script that illustrate what can be accomplished with a little practice



A commercial awl-type handle with a very small triangle file tip

These two are homemade handles probably mesquite wood, with triangle file tips

The piece of work should be held down securely by clamping, cementing or tacking to a firm base to avoid the possibility of movement. Keep the fingers out of line of the graver so a slip will not result in an injury. The design or letters should be sketched on the piece of work with a fine line felt tip pen. To engrave, start with moderate pressure to adjust the depth of cut into the metal. Practice on several pieces of scrap metal. The angle of the tool to the metal to be engraved should be steep enough to keep from slipping and shallow enough to allow the point to easily rock and move along, following the line. Try only straight lines at first. After much practice, curves, circles, flowers and even script can be attempted. For a great amount of engraving, an engraver's block should be acquired.

LEAF AND FLOWER DECORATIONS

Buckle

Bracelet

The leaf and flower decorations shown above are lost wax centrifugally cast pieces made commercially and are not Indian made. They can be purchased from many of the silvercraft suppliers. These are but a few of the many designs available. Once they are incorporated into a piece of jewelry it is usually so difficult to distinguish them from the handmade decorations that only an expert can tell the difference. However, most of the decorations on the jewelry pictured on these two pages are Indian handmade.

Whiskey jigger

Money clip

This cast snake is only one of the many cast figures available

The decorations shown below are examples of how attractive handmade leaves and flowers can be made. The real leaves around the border are just a few of the unlimited number of natural leaf shapes that can be used as patterns.

The progressive steps in making a leaf

The easy way to obtain a design is to trace or sketch the outline of an attractive leaf on a suitable size piece of silver scrap. Use silver thick enough so it will not bend easily once it is applied, usually 18 or 20 gauge. To make a heavy leaf with a central stem, solder a piece of half round silver wire down the center. The veins are then stamped. To make "S" figures and spiral shapes, thin strips about 1/8 inch wide are cut from 20 gauge sheet and bent with round-nose pliers.

When soldering decorations onto a piece of jewelry, tiny chips of solder, or silver solder filings should be used

A few of the miscellaneous "fill-in" shapes that can be used

These examples illustrate the many leaf backgrounds that can be used and the chasing tools used to make them

THE MULTIPLE STONE BELT

The belt with numerous small stones is usually a woman's belt. The ones with larger stones are worn more by the men. This belt is made up of 8 conchas and 9 butterflies plus the buckle. This makes a belt to fit a 38 to 40 inch waist. It is usually worn over a dress or jeans so it should be larger than the fitted belt. The conchas can be spaced out to make it larger or taken out to make it smaller.

An old concha male and female die

The shell or rosette design is pressed into the eight pieces of 20 gauge silver.

Twenty 6-millimeter cups for the stones are soldered around the rosette and an oval bezel cup is soldered in the center of each concha. Care should be taken to separate each bezel cup sufficiently so none are soldered together. The best way to accomplish this is to melt a chip of solder with flux on the bottom of each cup before placing them around the rosette.

A small silver ball is soldered between each bezel cup.

The design is stamped around the edge to form scallops and carry out the shell motif.

The entire concha is sawed out with a jeweler's saw.

A copper strip ¼-inch wide is formed over a one-inch piece of strap iron, to form a loop for the belt. One of these copper loops is soldered crossways on each concha and lengthwise on each butterfly to accommodate the belt.

The buckle is made in a similar manner except a 1 x 1 inch hole is sawed in the center for the belt to go through. Pieces of 12 gauge round wire are used for the cross bar and the tongue.

An old set of butterfly dies, male and female

This particular style concha belt, a favorite amont the Indians of the Southwest, is worn for every occasion, but especially for celebrations. It is truly a "home-grown" product. They say, "It can't be worn back East", or "They don't wear such things in Kansas City". They certainly wear it in New Mexico and Arizona! To see one of these beautiful turquoise studded belts around the waist of a lovely woman, is one of the most attractive sights to be seen in the Old West today.

Nine butterfly spacers are stamped out and seven 6-millimeter silver cups are soldered on as shown.

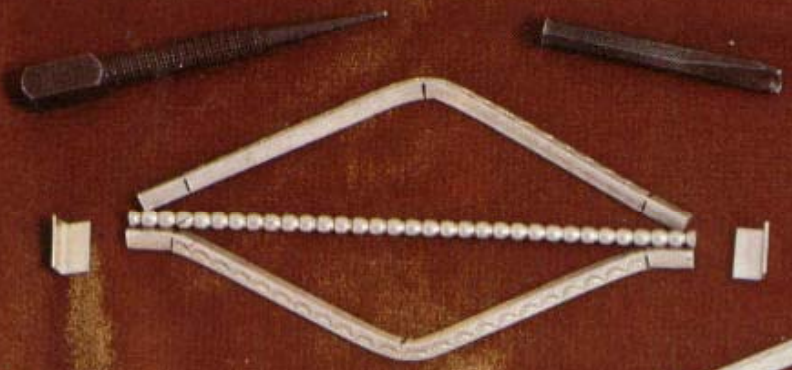
The design is stamped around the edge of the cups and the butterflies are sawed out with a jeweler's saw.

The copper belt loop is soldered on the back, the stones are set and the whole belt polished and strung on a strip of one inch black leather.

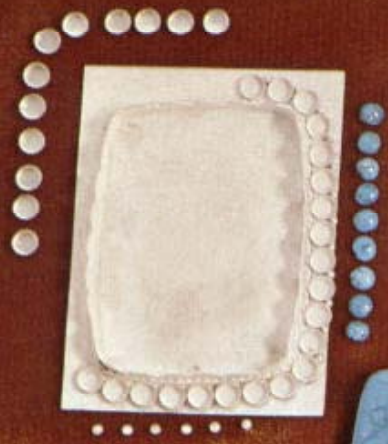
A total of two-hundred and forty-six 6-millimeter round turquoise stones and 8 oval ones are necessary to complete this belt.

THE LARGE STONE CLASSIC BRACELET

The large bracelet presents a greater problem of construction because it is more difficult to bend the heavier parts and also the larger mass of silver needs a great amount of heat in order to solder it.



The 2 gauge triangle wire shanks, 6½ inches long, are stamped with a selected design and then bent into a "V" shape wide enough to accommodate the large stone, using a vise. The three pieces, including a center strip of number 4 gauge round bead wire, are soldered together at the ends. After being soldered, the bracelet is shaped around a bracelet mandrel.



A strip of 26 gauge silver is cut, stamped and filed with a scalloped design to form the bezel for the large stone. The bezel, twisted wire, bead decoration and 7 mm. cups are soldered onto a large plate of 24 gauge silver. The entire assembly is sawed out with a jeweler's saw as shown.

For decoration on the sides, a concha of appropriate size is split in two and half is soldered on each side of the bracelet below the plate. Three small round cups are then soldered onto each concha half to make up the side decoration. The large center stone is set first, then the small ones. The bracelet is then polished.

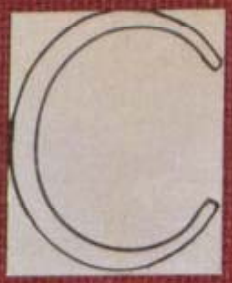
The large stone bracelet or ring surrounded by small stones deserves special credit. There is something about surrounding a large stone with smaller ones that makes it outstanding, a classic work of art. This is true of all large stones, diamonds, rubies, emeralds, or turquoise. When surrounded by a band of smaller stones, the large stone has more prominence, importance, beauty and classic appearance.

THE ZUNI STYLE TURQUOISE INLAY BRACELET

The inlay bracelet developed by the Zuni artist and craftsman is near the height of the development of the craft. There is no limit to the number of designs that can be executed. However the simpler or less complicated ones are usually the most pleasing.

A strip of 18 gauge silver is cut to size and the ends tapered. It is then bent over a bracelet mandrel to fit the wrist.

1 3/4" X 5 3/4"



The base plate is soldered onto one of the side pieces as shown. It is a good idea to saw or trim away the extra silver before soldering the other side piece into place. This is to reduce the amount of heat necessary for soldering. Two pieces are cut to fit the outside curve of the bracelet and bent to fit. They are then soldered on top of the side pieces. This covers the ends like a box with a space in the center for the stones. The inlay bracelet should be constructed entirely of heavy silver. This should be of at least 18 gauge thickness to prevent the bracelet being bent while putting it on or taking it off the wrist, or while it is being worn. Since the stones are cemented securely into their channels, any movement of the silver may loosen them and cause them to come out. It is very difficult to repair this type of jewelry if it is broken.

A narrow channel bracelet of Blue Gem turquoise circa 1955

Designs such as this bracelet can be utilized to make use of smaller pieces of turquoise.

A bracelet with two rows of channel stones shaped into a ridge down the center

Turquoise and coral channel bracelet of unique design

Seven strips of 18 gauge silver are cut the exact lengths for their positions and soldered in to divide the spaces into 6 equal parts. These strips extend a little higher than the surface of the turquoise is expected to be, so they can be ground down flush with the surface of the turquoise. Eighteen pieces of silver are cut to fit between the cross bars and are soldered into place, several at a time, to form 24 spaces for the turquoise stones.

A combination of jet and turquoise forming a domed center

A pair of channel bracelets set with thin slabs of Number Eight turquoise

Each stone must be ground individually for each box or channel. The stones should be cut slightly wedge-shaped, similar to the plug of a watermelon. The best method is to cut a few to fit, about two or three rows at a time. These are cemented into place before cutting others. The stones must be left to dry thoroughly before cementing.

Several are cemented in at a time and the epoxy cleaned away so the next stone can fit snug in the channel. Considerable skill and care in grinding is needed to complete this bracelet. To create a stronger bond, the bracelet can be placed near a lighted electric bulb to heat for several minutes. (No closer than 6 inches.) The turquoise surface should be ground smooth on a cutting wheel, then sanded and the entire bracelet polished.

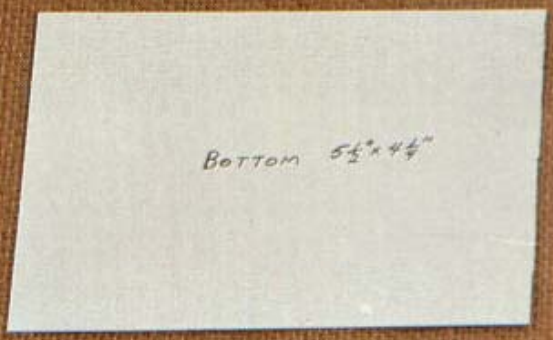
A good quality, two component, epoxy should be used. "Easypoxy" is one of the best (See page 37).

The finished bracelet of fine Castle Dome turquoise

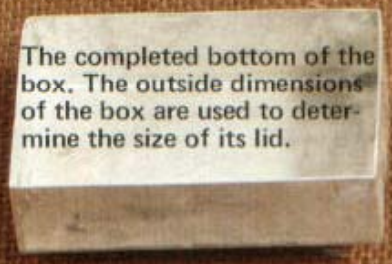
The formed box, or the box that is formed over a wooden form or pattern, is one of the easiest large boxes to make. The use dictates the size. This box is for cigarettes. Boxes can be made for cigars, candy, jewelry and many other articles.

Box by Jimmy Herald

Two pieces of hardwood are cut to the exact size of the inside of the box. Paper patterns should always be made to determine the correct size of the silver, showing exactly where the corners are to be cut out.



Silver sheet of 22 gauge or heavier should be used. After the sheet is carefully marked and the corners cut out, it is clamped between the two wooden blocks and bent with a rawhide mallet. A third wooden block can be used in the forming, as a buffer between the mallet and the silver.

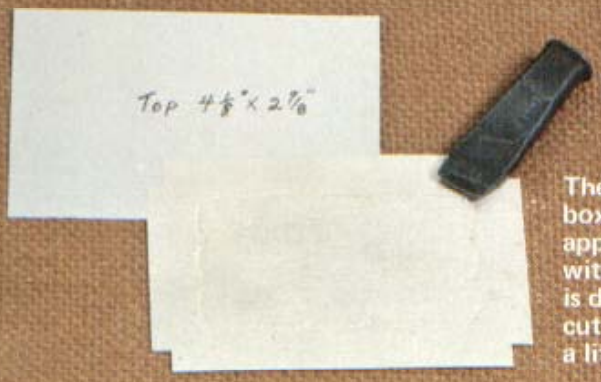


The completed bottom of the box. The outside dimensions of the box are used to determine the size of its lid.

When satisfactorily shaped, the corners are soldered. Any warping caused by heating may be corrected by inserting the block and straightening the box with a rawhide mallet.

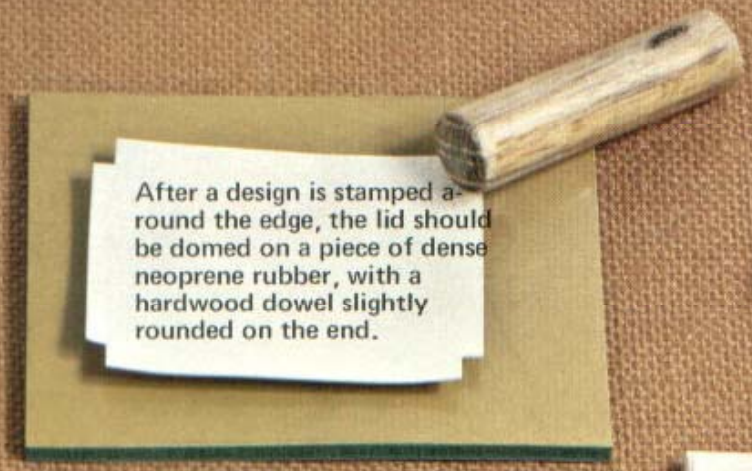
Box by Albert Hardy, 1947

Box by Jimmy Herald



The lid fits over the bottom of this box like a cap. Usually hinges are applied but this type can also be used without hinges. The size of the lid is determined and a piece of silver cut out large enough to fit, allowing a little extra for the bending.

Two more hardwood blocks are made, slightly larger than the first two. These are to be used for forming the lid.



After a design is stamped around the edge, the lid should be domed on a piece of dense neoprene rubber, with a hardwood dowel slightly rounded on the end.

After the lid is domed, the edges are bent around one of the hardwood blocks and then soldered.

Box by Daniel Enos, Jr.

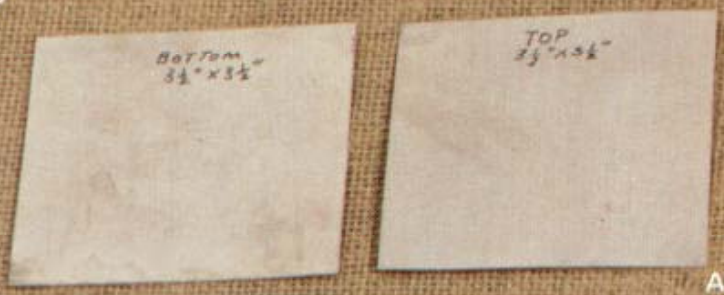
The bezel for a turquoise stone can be soldered onto the center of the top and surrounded by a circle of twisted wire. If hinges are to be used, they should be made and soldered on as shown. After the lid is pickled in acid, the stone is set and the box is polished.

THE SHELL TOP BOX

Box with large turquoise top

This type of box is made with a large stone or shell for the top with the side formed of a single piece of silver bent to reflect the shape of the object mounted in the top. It is probably the most difficult of the boxes to make.

A shell is selected; its size determines the size of the box



All the silver is 24 gauge. A piece of silver 1½ inches wide and the same length as the perimeter of the shell is cut, stamped, bent and soldered to form a cylinder

One of the silver plates is now soldered on one end of the cylindrical sidepiece with the seam to the back, to form the base. This piece forms both the top and the bottom and is a good way (when these are cut apart) to have them match perfectly.

Box with shell top done by Lambert Homer, Jr.

A bezel of 26 gauge silver strip is formed around the shell and soldered to the top plate.

Box with Kato top

The feet are three hollow beads. To make them more sturdy, a piece of round silver wire is soldered through the holes before they are soldered onto the bottom of the box.

A circle is cut out of the top plate inside the bezel leaving enough room for the shell to be securely mounted. The plate is then aligned with the body of the box and soldered to the sidepiece. The base plate is trimmed with a jeweler's saw and the joint filed smooth. The lid is removed by sawing on a line about ¼ inch below the top. This can be done with the Foredom tool using a thin circular saw or carborundum separating disk.

The bottom of the box showing the three bead feet in place

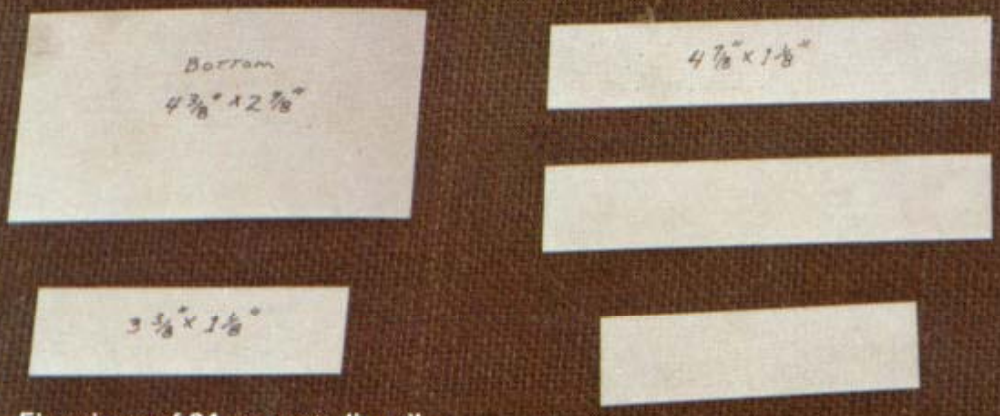
A strip of ⅛-inch, 24 gauge silver is bent to fit and then soldered on the inside lip of the bottom of the box so that it forms a rim to hold the lid in place when the box is closed.

The finished box showing the button latch

A tube and wire hinge is made and soldered to the top and bottom, respectively.

THE MOSAIC TOP BOX

This unique box is designed so the lid forms one large channel or bezel for the turquoise inlay. The feet are large hand-cut turquoise beads.



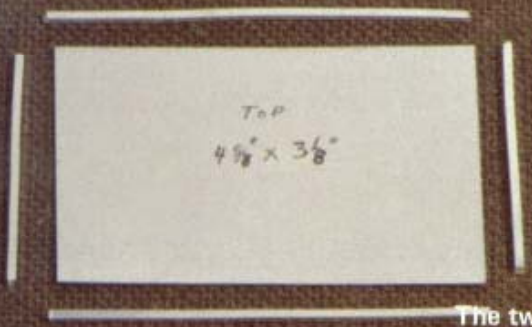
Five pieces of 24 gauge sterling silver sheet are used to make up the body of the box.

The simple but unique bendi of the sides is accomplished b making a bending jig. A piece o hardwood (oak) 1½ x 3½ x 4 inches is drilled through th center of the longest dimensio using a one-inch wood drill. Th block is cut in half, lengthwis through the center of the hole Either half can be used as th female die. The side of a on inch hardwood dowel is used t hammer the silver side strips int the wooden channel. The ends o each sidepiece should be cut t match the curve of the other

The side pieces are held in place with "third hands" and soldered. This frame, made of side pieces, is then soldered on a 24 gauge plate. The sides are then trimmed and filed. To prevent the frame from warping while it is being soldered, it should be held down by a weighted asbestos block while the final seam is soldered.

To make the hinge, take a piece of 8 gauge silver tubing a little shorter than the length of the box. Cut it into five equal pieces, solder three of these pieces along the top edge of the box with equal space in between as shown. A piece of iron wire put through the holes will align them and hold the pieces of tubing in place while they are being soldered.

Cut a piece of 24 gauge plate 1/8 inch longer and 1/8 inch wider than the top of the bottom of the box. Around the edges of this plate solder four pieces of number 10 square wire and fit carefully to hide the seam.



The lid is hammered on a dense piece of neoprene rubber with the frame of square wire down, in order to dome it. A wooden mallet with a slightly rounded end is used for this operation.

The two remaining pieces of silver tubing are soldered onto the edge of the top, under the square wire frame, in a position to form a continuous hinge when the box is assembled.

A large number of turquoise triangles (75 or 80) are cut about 1/3 inch thick and one inch long. The angles should vary in order to make an interesting pattern. They are first fitted into place and then cemented with a strong black epoxy.

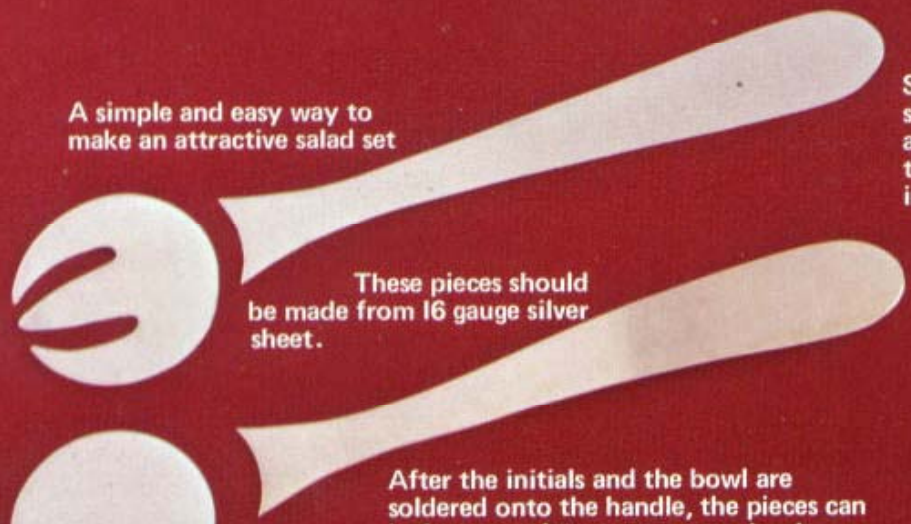
Holes are drilled in the 4 corners of the bottom of the box to accommodate the feet, which are put on with "Chicago screws" or "key post" fasteners.

After the box has been polished, the lid is fastened on with a piece of 12 gauge round wire pushed through the holes in the tubing. The ends are then peened.

Good results can be had by using a type that is made for repairing the dented fenders of cars. The kind shown here is "EasyPoxy" made by Conap, Inc., 1405 Buffalo St., Olean, New York, 14760. After setting for 24 hours, the entire top is ground on a fine lapidary wheel to a smooth dome. It is then sanded and polished.

The feet are made of 4 slightly flattened turquoise beads about 5/8 inch in diameter and 3/8 inch thick, hand ground and polished, and drilled with a 1/8 inch hole through the center.

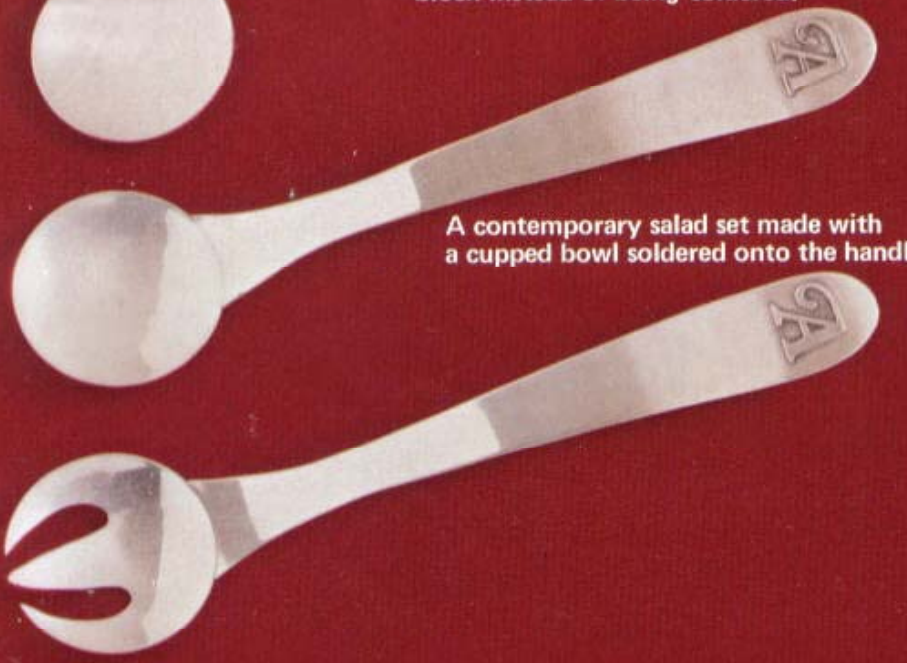
A simple and easy way to make an attractive salad set



These pieces should be made from 16 gauge silver sheet.

Silver spoons were made by the Indian silversmith before 1900. Pictures taken about that time show a number of them in the process of manufacture in the workshops.

After the initials and the bowl are soldered onto the handle, the pieces can be hammered to restore some hardness. They are then filed and polished. If large enough pieces of heavy silver are available, they may be cut from one piece and the bowls hammered into a dapping block instead of being soldered.



A contemporary salad set made with a cupped bowl soldered onto the handle

Small salad set

Ice tea spoon

Stamped salad set

Butterknife

Two early American coin silver spoons circa 1780. They were hammered from cast slugs.

The successive steps in making a spoon from a ½x¼ x 4inch cast slug of silver

Progressive steps in making a salt spoon. Made with a 5/8 inch disk of silver, domed, with a silver handle decorated and soldered on.

Hammered on an anvil and frequently annealed by heating it to a red heat and quenching.

When the right thickness and shape are attained the outline is traced on the silver and sawed out.

An old silver-plated fork that has been hammered flat to be used as a pattern

A variety of salt spoons

With a great deal of work and skill, and the correct size and shape of the cast slug, very little trimming should be necessary.

Forks made from heavy silver sheet, 16 gauge or heavier. The silver was hammered to make it hard before it was sawed out and filed. It was then bent to a comfortable shape over a bracelet mandrel and polished.

In about 1920 one of the Navajo silversmiths after making dozens of tiny salt spoons and being informed of their use, remarked, "The white man must eat an awful lot of salt!"

Spoon stakes for use in forming the bowl of the spoon

These are only a few examples of what has been done to adorn the revolver or pistol with silver and turquoise grips.

Plates of 18 or 20 gauge silver sheet are cut slightly larger than the area they are to fit. Filing and polishing should bring them to exact size when finished.

Pieces of 18 gauge strip silver, ¼ inch wide, are bent to fit the outline of the original wooden grip. This forms a channel into which the turquoise mosaic is cemented with epoxy.

Care must be taken to make openings to accommodate the release button and the screw to hold the grip in place. Small silver washers can be made to build up necessary thickness for screws.

Silver handmade grips made by hammering 18 gauge silver sheet over a form. They are undecorated and easy to construct.

A lost wax centrifugally cast grip inlaid with turquoise

The grip on this Bauer 25 caliber automatic is made of a solid piece of stabilized Mexican turquoise.

This turquoise channel inlay grip has heavy silver sides and back.

Since most guns are hand finished, there is usually a slight variation in the size of each gun grip, even if the guns are mass produced.

The checkering on the original walnut grip was carved out and a turquoise mosaic inlaid in its place.

An old Smith and Wesson with an early stamped grip

These guns were photographed on a portion of a painted buffalo robe.

Additional sand is dumped in and pressed firmly into place with the fingers or a dowel. When the flask is full, the excess sand is scraped off even with the surface of the flask. Small ventilation holes should be made by ramming a venting wire through the sand, in many places, just touching the surface of the model. This is to let air and steam escape when the molten metal is poured.

The model should be placed, face up, on a board that fits the flask opening. (Two of these boards will be needed.) The model and board are dusted with parting powder. Sand is sifted on to the model until the surface is covered.

Venting wire tools, made with 20 gauge piano wire

Uncleaned casting, showing where vent holes were filled with silver

The flask is ready to have the metal poured in after the two halves are firmly clamped together. The silver is poured and the metal allowed to cool for a few minutes. The casting is removed, cleaned, filed and finished.

The flask is then turned over and the model carefully removed. A gate or pouring channel is cut in the sand from the top of the model to the pouring hole. The other half of the flask is placed on a board that has been dusted with parting powder and filled with sand like the first flask. This forms the flat or back half of the mold. This is turned over and the other half of the gate cut in the sand.

Model for a cast bracelet

Cast silver bracelet, filed and cleaned

Cast bracelet bent ready to receive bezels and decoration

Finished bracelet

Each silver casting is filed and a loop of triangle or half round wire is soldered to the top, forming a pendant. It is then darkened and polished.

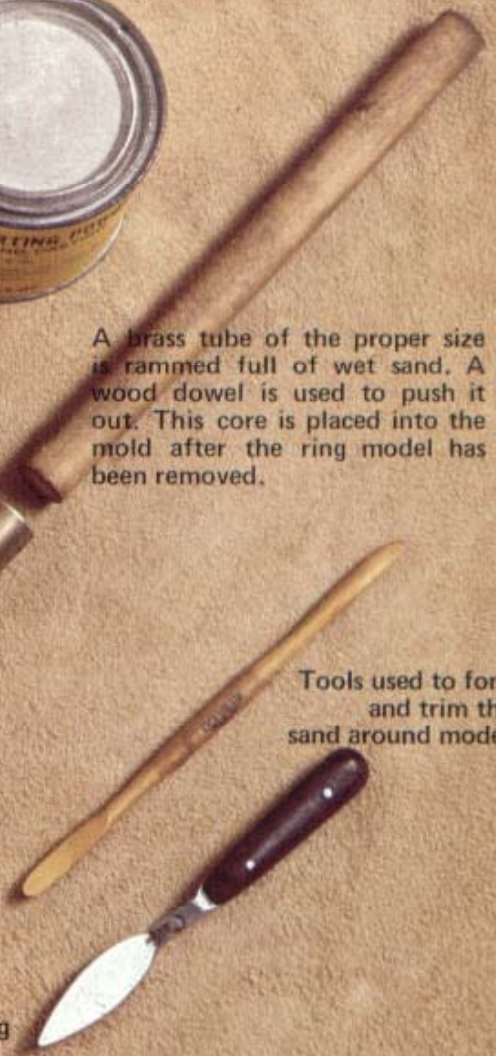
Parting powder is a moisture resistant powder, that is usually partly composed of lycopodium powder, which is the minute spores of a club moss. This powder, when dusted on the surface of a wet sand mold, or the surface of a model, forms a barrier to keep wet sand from adhering to the dusted surface.

A small amount of parting powder is put on a thin cloth and the cloth tied into a bag. This is used to dust a thin coating on the model to act as a moisture barrier.

The drag showing the top of the ring already molded

A special ring making flask

A brass tube of the proper size is rammed full of wet sand. A wood dowel is used to push it out. This core is placed into the mold after the ring model has been removed.



The cope with the ring and the mandrel in place, ready to be removed. The core should then be put in place. The two halves are put together and the metal poured, forming the ring.

Tools used to form and trim the sand around models

The sprueplate with half arbor and sprue in place

The trimmed ring

The filed ring

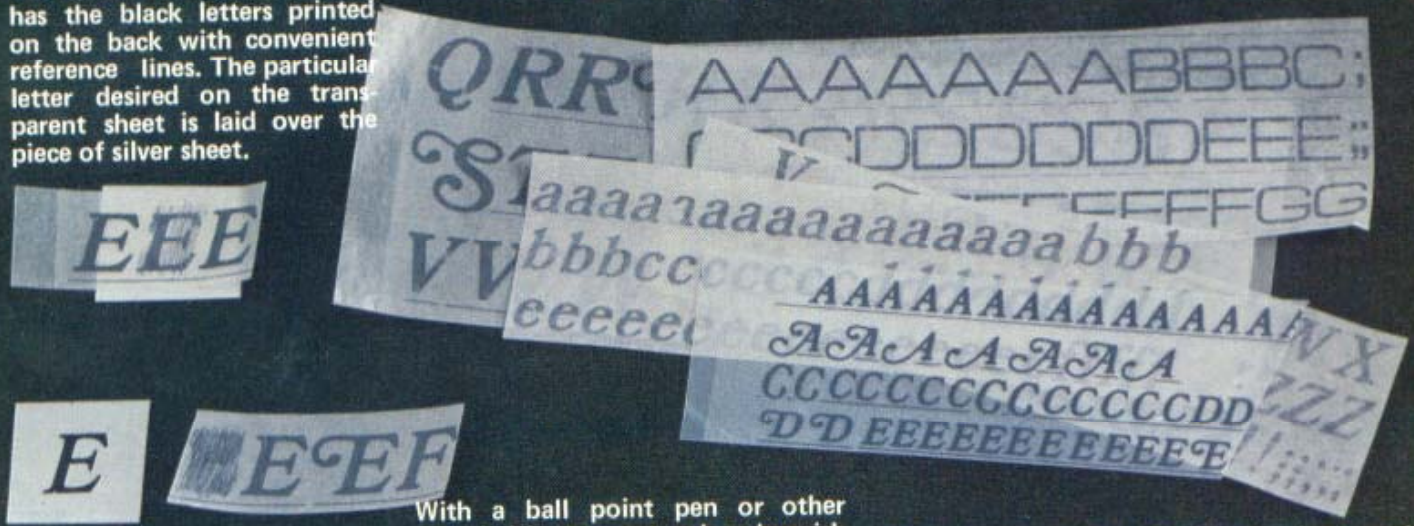
The finished ring

The ring as it comes from the mold showing vent holes made by shoving vent wires from the top of the ring mold through the sand to the wood base underneath

Always use a little powdered borax in the metal being melted.

The time-honored foundry method for casting metal, using a sand mold, was used very little by Indian silversmiths until recently. A matching pair of casting flasks is necessary, as is a quantity of fine sand. Many places in the Southwest a good sand can be found which has been blown by the wind until the edges of its grains appear rounded when viewed under a magnifying glass. Good sand can also be purchased from jewelers' supply houses. Before being used, the sand must be mixed with water until it reaches the correct consistency. A good test for this is to squeeze a handful of sand into a "cigar". When the "cigar" is broken, if it breaks cleanly, without crumbling, it is about ready to use. The sand should be dry enough so that it doesn't readily stick to the fingers and also to pass through a "window screen" sifter without clogging it.

A sheet of transparent paper has the black letters printed on the back with convenient reference lines. The particular letter desired on the transparent sheet is laid over the piece of silver sheet.



With a ball point pen or other rounded instrument, rub or burnish the transparent paper over the letter with broad strokes in order to press and transfer the letter onto the surface of the silver. When the transparent sheet is removed, the letter will stick to the silver sheet and can be sawed out with a jeweler's saw.

Saw out the initial

The easiest and probably the best method of making initials is to use the press or transfer type letter. There are many different kinds, made by a number of companies, obtainable at the local art supply store.

Belt buckles illustrating two types of overlay techniques

The jeweler's saw is used to cut out the letters.

Cuff links

Tie clasp

Buckle

Necklace

Bolo tie and pins

The technique of overlaying letters and initials in silver is included here because it has been a small part of Indian jewelry making, even if it was only done at the request of traders and clients. Indian silversmiths complied with the requests of clients to adorn silver articles with initials before 1900. This practice will probably be popular in the future also.

Letter openers

Key chains

Earrings

Pendant

Stick pins

The articles on this page are shown to suggest the many uses for this technique.

Liquor bottle tags

FASCINATORS

ZUNI MULTICOLOR INLAY

Zuni multicolor inlay is an extremely popular expression of Zuni art.

The method of constructing the inlay is as varied as are the figures represented. The original method was to cement all the tiny pieces of different materials to a piece of old phonograph record which had been cut or sawed to shape.

The rainbow of colors used to make up this jewelry are specially cut pieces of turquoise, coral, jet, tortoise shell and the many colors of various shells. All of these materials have some meaning in the Zuni's religious background. The main figures depicted have a part in Zuni mythology. Some of these are the Rainbow Man, the Knifewing or Thunderbird (a creature half man-half eagle), the Sunface and many Kachinas. The Zuni imagination is limitless in this medium. Also represented are all kinds of animals, both wild and domestic. Every kind of bird and many kinds of insects, especially dragonflies and butterflies, reptiles, frogs, horny toads, and even humans are included.

Checkering file used to serrate silver strips for bezels

The pieces were sanded and polished, bezels were made and decorations assembled and soldered onto a silver plate which was to make up the piece of jewelry. This example is a bolo tie. The excess silver plate was sawed away, the bolo back put on, the components carefully set and the bolo polished. This is only one of the many techniques employed to make this jewelry. Although still used, the phonoagraph record has been replaced with sheet plastic or sheet aluminum. Sometimes even pieces of the bottoms and sides of old aluminum utensils are used.

The methods of cutting the stones and assembly of pieces vary with the individual artist. Generally the stones are cut, assembled and cemented to a backing and the bezel and piece of jewelry constructed around the figure.

The Rainbow Man bolo tie with inlaid tips

The completed Rainbow Man

The pieces for this sunface ring are cut, assembled and cemented to a thin piece of aluminum sheet. It is then sanded, polished and a ring is made for it.

Rainbow Man ring

Butterfly ring

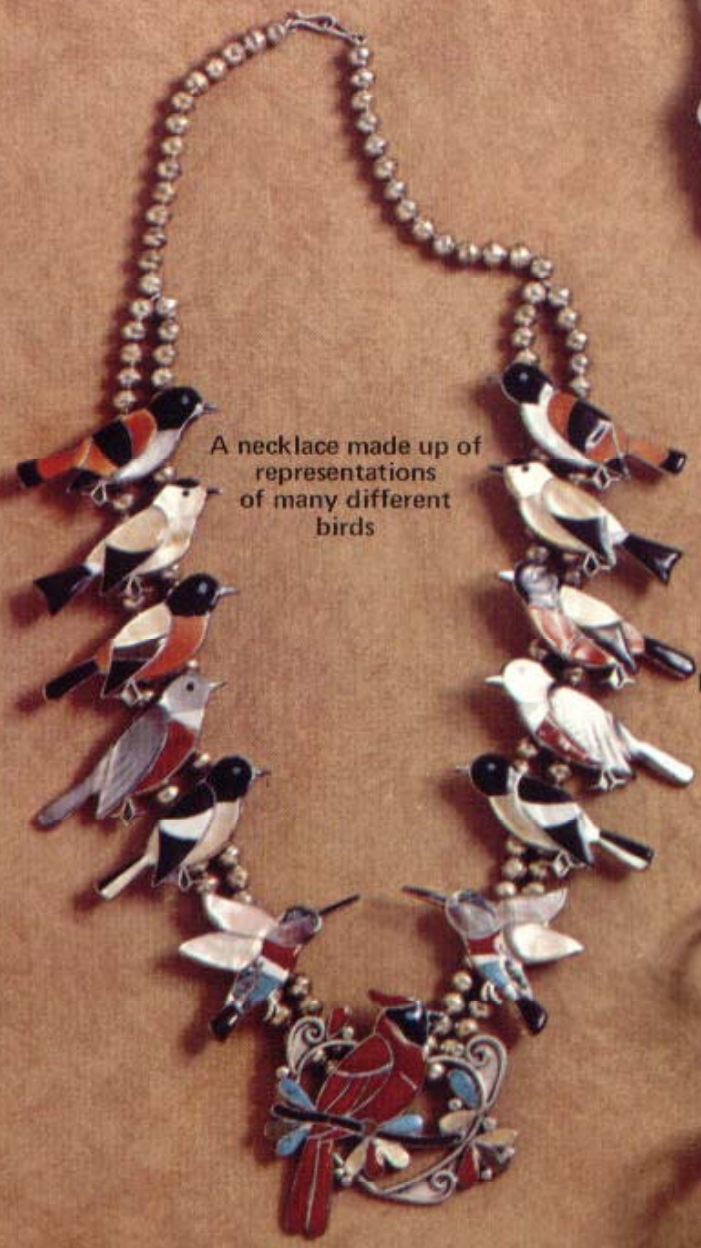
Kachina mask ring

Sunface ring

Wrap around inlay ring

Some years ago a woman at Zuni was seen wearing a rather large inlay pin depicting an old style iron bed with white sheets and pillows covered with many tiny red bed bugs!

Rainbow Man bolo tie



A necklace made up of representations of many different birds

Indian with headdress bolo tie and sunface tips

Knifewing pin

Sunface bracelet

Knifewing bracelet

With this butterfly pin, the silverwork was done first and the stones cut to fit. It is technically channel but looks like inlay.

Inlaid earrings

Blue Jay ring

Sunface ring

THE ZUNI CLUSTER

First the round silver wire bracelet shank is constructed. A plate of 24 gauge silver is used to form the base for the rosette or cluster of small bezels.

To make all the bezels in a row uniform, a nail or bolt is ground or filed to a particular shape -- oval, round or drop -- and the bezels shaped around this form or jig. The bezels are of 28 or 30 gauge silver strip about 1/8 inch wide. One edge is filed with a checkering file. After all the bezels are soldered onto the plate, the cluster is sawed out around the edges and then soldered onto the bracelet.

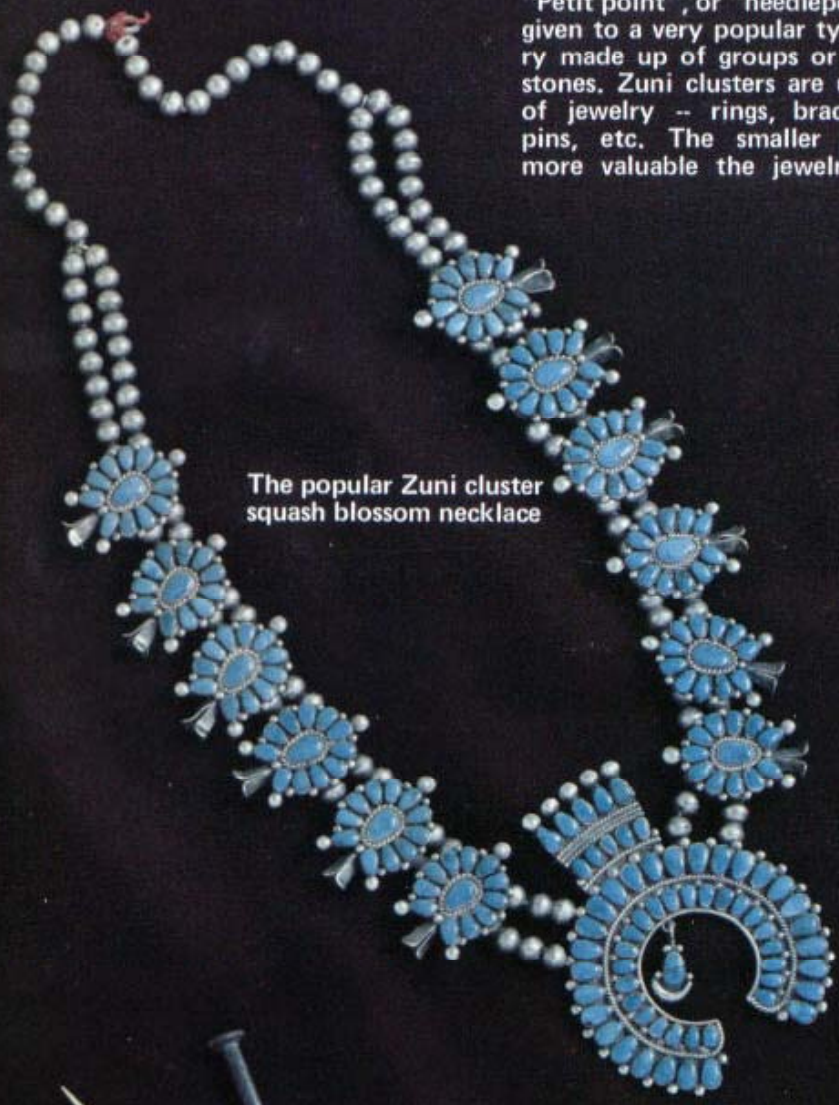
The small stones are dopped onto small birchwood meat skewers and cut to fit the bezels. Frequently a copper template is cut by sawing and filing holes the same size as the jig tools and the bezels. The stones are then uniformly cut to fit the template holes. After the stones are cut and polished, they are removed from the sticks and the wax cleaned off with cheap rubbing alcohol (isopropyl). The stones are then carefully set. A small thickness of paper is put under the thin ones to make them all the same height. The bracelet is then polished.

Usually a bracelet is made up of one large and two small clusters.

A long cluster ring

The simplest type of cluster

"Petit point", or "needlepoint", is the term given to a very popular type of Zuni jewelry made up of groups or clusters of small stones. Zuni clusters are used in all kinds of jewelry -- rings, bracelets, necklaces, pins, etc. The smaller the stones, the more valuable the jewelry is considered.



The popular Zuni cluster squash blossom necklace

Cluster watch band

The technique used in the construction of this jewelry is the opposite from most, in which the metal is designed and constructed around the stone. With this type, all the silverwork is done first and then the stones are cut to fit the bezels. Usually the stones are so small the setting is made easier by the use of serrated bezels.

A needlepoint bracelet

Earrings and pins of very long stones

Two petit point pins with stones so small they were cut on the ends of round toothpicks

The articles pictured here are intended to illustrate a few of the many hundreds of odd and unusual items the Indian silversmith was called upon to make. Sometimes these items are called trivia and frequently become "collectibles".

A wall container for wooden matches

A baby rattle

Snake bracelet

Papoose Carrier pin

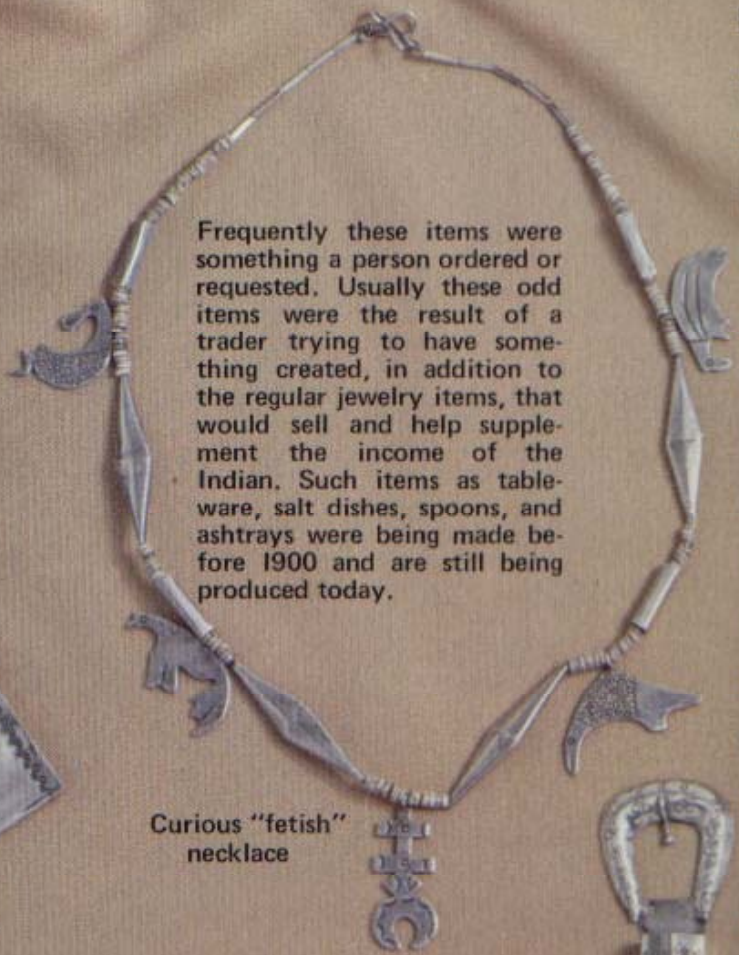
Brooches

Salt dish with spoon

Pepper shaker

Salt and pepper shaker

Snuff box top



Frequently these items were something a person ordered or requested. Usually these odd items were the result of a trader trying to have something created, in addition to the regular jewelry items, that would sell and help supplement the income of the Indian. Such items as tableware, salt dishes, spoons, and ashtrays were being made before 1900 and are still being produced today.

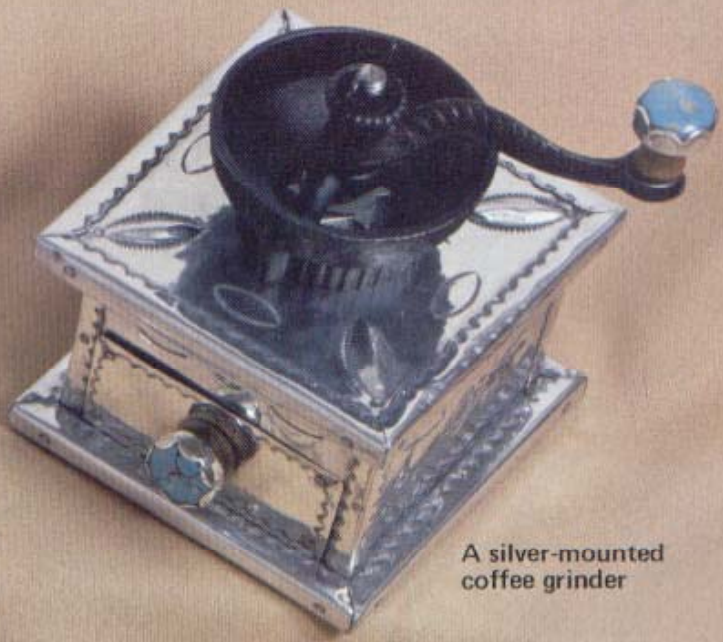
Paper match case

Ashtray

Curious "fetish" necklace

Bolo tie slide shaped like a belt buckle

Book marks



A silver-mounted coffee grinder

Napkin ring

The Indian silversmith is not alone in having created articles he would not otherwise have made. Two of the world's greatest jewelers did the same thing. Benvenuto Cellini created the famous golden salt cellar for the King of France. Carl Faberge made dozens of fancy Easter Eggs for the Russian aristocracy.

Belt buckles

"Curio" spoons of about 1910

Watch fob

Whiskey jigger "self dumping"

Bone ink well

Key chains

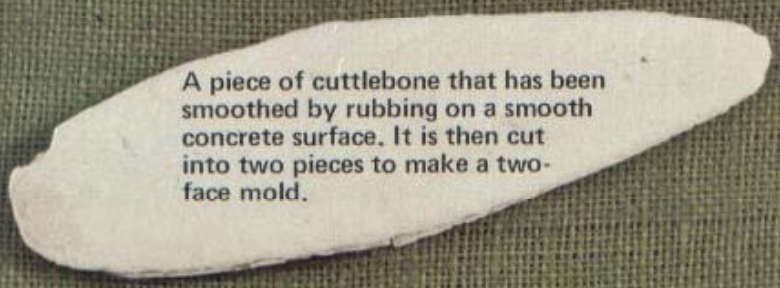
Cigarette holder

Pocket knife

A key chain and driver's license case circa 1945

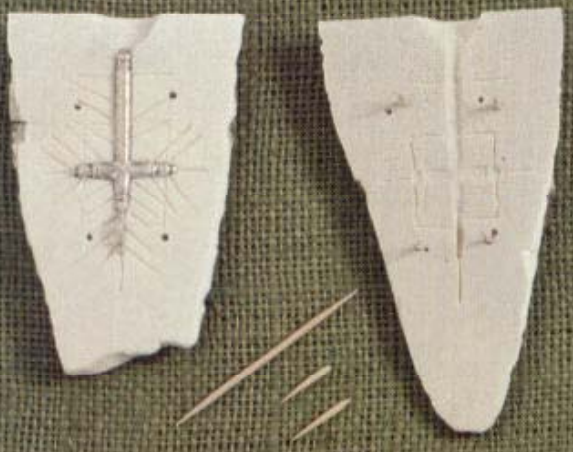
Letter opener

CUTTLEBONE CASTING



A piece of cuttlebone that has been smoothed by rubbing on a smooth concrete surface. It is then cut into two pieces to make a two-face mold.

Jewlery makers in many parts of the world have been using cuttlefish bone for casting since very ancient times. A few Indian silversmiths tried it in the 1920's and 1930's, but their own native tufa was easier to obtain and much more suited to their needs.



The model is pressed into one side of the mold and wooden locating pins (round toothpicks) are put into place before the two halves are pressed firmly together.

After the model is removed, the mold is coated with a thin solution of borax, water glass and water. The mold must be thoroughly dry before the metal is poured.

A crucible used to melt and pour small amounts of silver

The two halves are then put together, using the wooden pins as guides and the metal is then poured. The resultant casting is shown.

An old Mexican style buckle was pressed into this piece of cuttlebone. Only a thin carbon coating was applied. When the metal was poured, it burned out the softer areas of the bone, resulting in an attractive surface design.

This piece of fire-clay composition soldering block was used as the flat half of the mold for all the castings on this page. It shows no apparent damage.

Soft black iron binding wire is ideal to hold the two halves of a mold in place.

The design of a belt buckle was carved into this piece of cuttlebone. Only a thin coating of carbon from a smoking torch was applied. When the metal was poured, the hot metal burned away the softer areas of the cuttlebone mold, leaving an interesting design on the silver surface, resembling ripples in sand.

Cuttlebone is sold in pet stores for use in cages for birds to sharpen their beaks on and as a source of calcium. Some jewelry supply stores are now stocking cuttlebone.

A design of a watch fob was carved into this cuttlebone and the metal poured without the surface of the mold having been coated. The hot metal almost destroyed the mold. A deep ripple design was left on the silver surface.

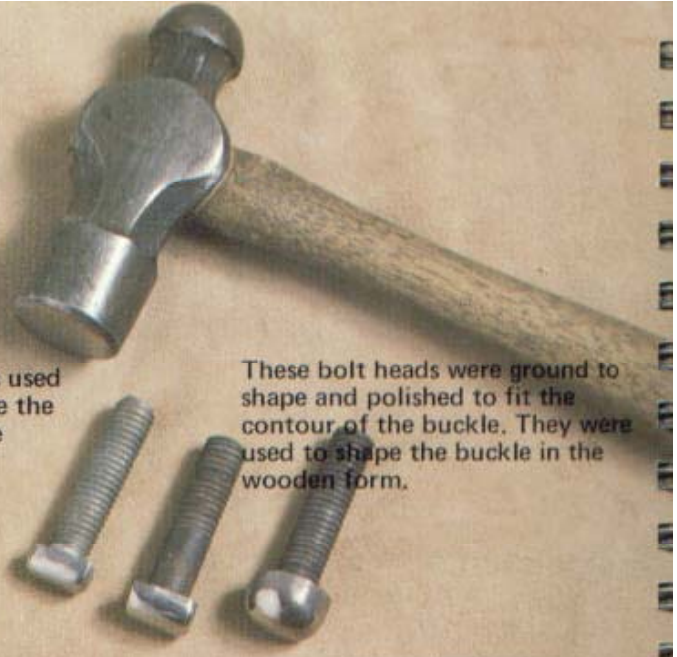
This brass model of a button was pressed into the cuttlebone. The mold was coated with a borax and water glass solution. When dry, it was coated with carbon from a torch. No burning away of the mold was noted until several buttons were cast. Before each casting the mold was thoroughly smoked.

A good coarse half-round bastard file is ideal for filing away burrs and rough edges of castings.

THE HORSESHOE BUCKLE

This buckle is constructed of 24 gauge silver sheet. The main part is stamped and formed in a wooden form, then soldered onto a flat plate,. This makes a hollow, lightweight buckle.

The stamps used to decorate the buckle



These bolt heads were ground to shape and polished to fit the contour of the buckle. They were used to shape the buckle in the wooden form.

The pointed tip is stamped and soldered to a frame on a base to make a box with an open end. When finished it is glued onto the end of the belt.

The guide is a 1/2-inch wide stamped piece of 24 gauge silver bent U-shape, large enough to accommodate two layers of belt leather (about 3/8-inch thick). The U-shaped piece is soldered onto a plate so it has two open ends.

The concave shape of the buckle was ground in the end grain of a piece of redwood with small grinders, using a "Foredom" unit.

This is only one of the many ways to make the horseshoe buckle. It can also be sawed from a single piece of metal, constructed from many pieces, cast, inlaid or decorated with overlay. Some are even made of filigree.

A loop made of 9 gauge round wire is soldered to the back, and a tongue of 8 gauge half-round silver wire is made to fit.

The western-style horseshoe buckle has held up more pairs of Levis than any other single fastener. It made its appearance about the same time as the western jeans or Levis and has continued in popularity until recently, when the large Texas "Show off" buckles became popular.

The finished buckle on a 3/4 inch belt

An old buckle set, made in the 1930's, from Manuelito, New Mexico.

Five or more graduated and matched stones are necessary for a bracelet of this type.

Five 28 gauge silver base plates for the stones

Tubing, 9 gauge; hinge wire, 13 gauge; and a piece of bezel

An attractive Zuni style link bracelet set with Blue Gem turquoise

13 gauge round wire fits the inside of 9 gauge tubing best.

The plates (usually 24 gauge), bezels and decorations are assembled as shown.

A number of pieces of silver tubing, of 9 gauge, are cut to form the hinge pieces. These pieces must be very carefully matched and soldered on to the sides of the plate as pictured. Care must be taken to achieve the proper alignment of each piece while soldering.

The box, constructed of 24 gauge silver, is a closed, decorated box with a hinge tube at one end and a "T" shaped opening at the other to receive the spring catch.

Spacers to be used between the stones and fasteners

The spring catch is made of 25 or 26 gauge nickel silver to insure its flexibility after soldering. A hinge tube is soldered on one end and a small silver ball is soldered on a small tongue on the other. The perfect bending of this piece insures the workability of the catch. The best way to construct this type of catch is to get a commercial one and copy it, using "trial-and-error" experimentation to adapt it to individual needs.

A strip of bead wire for decoration

The final soldering of the balls to the ends of the hinge wire is accomplished by only the most skillful silversmiths.

The stones are set after all the soldering is done.

The completed link bracelet

This 9 stone link bracelet would take many hours to complete.

The intricate and delicate workmanship required to assemble the link bracelet makes it one of the most time-consuming and difficult projects undertaken by the Indian silversmith. Great skill is needed to solder the tube hinge pieces and especially to solder the silver balls onto the hinge pins.

An early link bracelet (circa 1920) that depends on a leather strap and a buckle as a fastening device.

THE DOMED CHANNEL BRACELET

The domed channel bracelet is usually a narrow bracelet inlaid with turquoise and other stones,which are cut to a high dome and give the appearance of half-beads set in the channel of the bracelet.

This is an old domed channel bracelet bought in northern Arizona in 1955.

A narrow domed channel bracelet is made by cutting a strip of 16 or 18 gauge silver ½ inch wide and to the proper length for the desired size. Two strips of half round wire of 6 gauge are soldered along the edges, and two heavy pieces of silver are soldered on the ends. The bracelet is then bent around the mandrel to the proper shape.

Several heavy silver inserts are soldered in at infrequent intervals.

Considerable skill and care in grinding is needed to complete this bracelet.

After the silver has been pickled and cleaned, the stones are cut to fit the channel. They must be beveled or slightly wedge-shaped in order to fit against each other as close as possible. Several are cemented in at a time and the epoxy cleaned away so the next stone can fit snug in the channel.

Stones that have been cut to fit the bracelet channel

After the stones are cemented in place, the bracelet should be exposed to light bulb heat and the stones cut to shape on a lapidary carborundum wheel, then sanded on a "heatless" rubber wheel. Be careful not to cut the silver away! The completed bracelet is then polished.

CUSHION STYLE INLAY

Cushion style inlay is an inlay done like that on pages 30 & 31. The stones are smoothed to a flat surface, a little higher than the level of the silver, and then the edges of each stone are rounded to form a cushion-like surface. Frequently several stones are put into a single box or channel and each multi-stone "cushion" carved.

The cushion channel bracelet is made in a similar way to the other channel bracelets but fewer silver dividers are used in the channels to separate the stones. Each stone is cut and fitted into its place. After several stones are cut, fitted and dried, they are cemented in place. Once the epoxy has set, the excess can be cleaned away with a small drill, using a "Foredom" grinding unit, and the next stones fitted closely in place. After all the stones are cemented in the bracelet and the epoxy is sufficiently cured, the surface is ground smooth, slightly higher than the surface of the silver channel.

A bolo tie of cushion cut channel inlay with matching tips

A thin carborundum "separating disk" is used in the "Foredom" unit to sculpture, or carve, a shallow cushion shape around the edge of each stone. Coarse and then fine heatless rubber bonded carborundum wheels should be used to smooth the cushion-like edges and tops of the stones. The entire bracelet should then be polished, first with tripoli and then with "Zam".

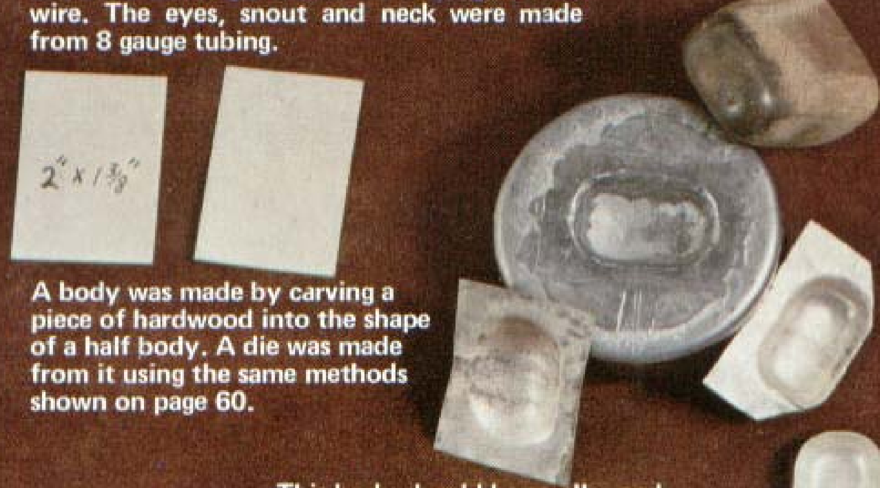
The "Foredom" unit, or flexible shaft grinder, with various disks and heatless rubber wheels used to grind and polish.

A dust mask should always be worn when grinding stones, especially when using heatless rubber wheels without water.

These tiny representations of Kachina figures are only three inches tall. They were all constructed from 26 gauge sheet silver, except the arms and legs, which are 4 gauge round wire. The eyes, snout and neck were made from 8 gauge tubing.

The Niman or Home Dancer

The Crow Mother



A body was made by carving a piece of hardwood into the shape of a half body. A die was made from it using the same methods shown on page 60.

This body should be smaller and more rounded in order to fit the bare arms and legs (8 gauge round wire for most of these Kachinas).

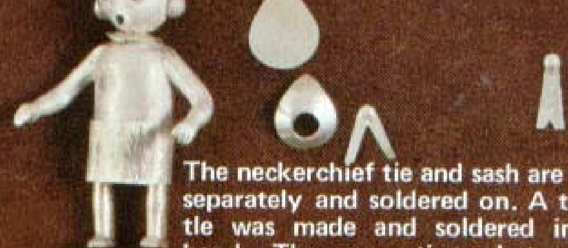
The Patun or Squash Kachina

The hands are filed and the arms are bent and filed to fit the curve of the shoulders, then soldered onto the body.

The head is formed of 2 half spheres like a bead. The eyes, snout and four melted balls are soldered on, completing the head. The neck is a short piece of tubing soldered into the body, onto which the head can be easily attached. The legs are made from two pieces of 4 gauge wire and the feet are two pieces of 4 gauge half round wire soldered into grooves filed into the end of the legs.

The skirt is formed of a piece of silver sheet scored with a checkering file to resemble cloth; the ends are soldered together and the skirt fitted to the figure and soldered on.

The White Ogre Kachina



The neckerchief tie and sash are formed separately and soldered on. A tiny rattle was made and soldered into the hand. The separations between the fingers and toes are done with a jeweler's saw.

The last tool used on the figures before they are polished is this tiny round punch, which is used to make the navels on the figures.

The Completed Mudhead

The Eagle Kachina

For the more elaborate parts of these figures, a few special stamps were made for designs on masks, skirts and feathers of various sizes. The more intricate designs were made with an electric vibrating tool. Also a number of designs and objects were made using several sizes of round wire.

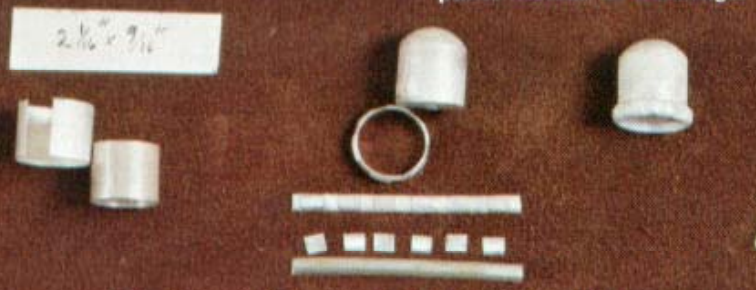
The Polik Mana
or Butterfly Dancer

The body for the Mastof is basically the same as the Mudhead body. The skirt is textured to look like leather, and there are six hand cutouts soldered onto the body. This figure is wearing moccasins and carrying a rabbit stick.

The helmet is a tube, topped with a shallow cup and a ruff of half round wire, scored with a checkering file around the bottom. The mask decorations are either cutouts or pieces of wire bent to fit.

The Kokopelli, or Humpback Flute Player, figure is quite different from the others shown. The body has been hammered into a long shirt, with the arms constructed of tapered tubing to represent shirt sleeves instead of bare arms, and the legs resembling pants instead of bare legs.

Kokopelli



This is a unique figure. It has pot hook eyes and a snout especially carved from round wire. A strip of silver divides the helmet, which is topped by a solitary feather.

The helmet is constructed tube-like, with a high round crown and a special ruff around the bottom to represent the black and white bicolor on the real mask.

The Snake Dancer

A Mudhead sitting
on a stool singing

THE BROKEN RATTLE
A young Mudhead, while dancing, shook his old rattle too vigorously and now it has broken. He is wistfully looking at the broken half lying on the ground.

Silver figures of Indians constructed of silver sheet and wire

The Zuni Water Carrier, wearing the authentic costume and carrying on her head a water jar, decorated with frogs. The figure is mounted on a green turquoise base.

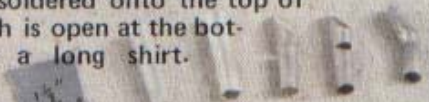
These diminutive (3-inch tall) Indian figures were designed to be as lifelike and as natural-looking as possible. A great deal of care went into giving each one as much character as possible. They are all action figures. Each one is portraying some kind of activity. Included are objects that contribute to, or add interest to, this activity. All are very uniquely appealing; even the bases were chosen and cut to size for each particular figure.

The most difficult item to make on these figures is the face. To accomplish this, a male and female die was made in order to stamp out tiny faces. First the end of a ½-inch round piece of tool steel was carved into a face using small carborundum, rubber-banded wheels on a "Foredom" flexible shaft. To form the female die, the polished steel face was then pressed into a shallow cup of melted KIRKSITE. The faces were then stamped out by putting an annealed half bead of the right size into the cavity and pounding. The face was then soldered onto a half bead to form the back of the head, and a neck of 10 gauge round tubing was soldered into the base of the head to make it easier to attach to the body.

Green malachite is the base for a Santa Clara Hoop Dancer.

The Navajo Sandpainter, on a red sandstone base, is completing his sandpainting from bowls of color sand.

After being formed, two of these halves were soldered together completing the torso or body. The head was soldered onto the top of the torso, which is open at the bottom end like a long shirt.



The legs and arms are made of pieces of sheet silver formed around a small mandrel and soldered. To get the bend in the arms and legs, small V's of silver were sawed out at the elbows and knees and the pieces bent and soldered. The arms are trimmed and fitted to the shoulders and soldered onto the body. The hands are filed from short pieces of 8 gauge silver wire and soldered into the ends of the sleeves. The legs are soldered on the inside of the lower edge of the shirt, as shown. The feet are pieces of half round, 4 gauge silver wire, filed to shape.

The Hopi Potter shown with the traditional hair-do of a young girl, is decorating her pottery. Base of ironwood.

The Apache Devil Dancer is just beginning his dance on a base of black limestone.

The body die was made by carving a piece of hardwood into the size and shape of half the torso.

The wood was then coated with a mixture of whiting and water and allowed to dry. The coated wood form was then pressed into a shallow cup of melted lead, to make an impression of the half-torso. The wooden form or punch was then used to pound the piece of silver sheet into the cavity, forming a half-torso.

The Sioux Chief offering his peace pipe to the Great Spirit. Base of red ryolite.

The Blackfoot Medicine Man is asking for power from the Great Spirit for his medicine bundle. He has a tiny silver knife in the scabbard on his belt. Base of yellow limestone rock.

The Crow Sundancer blowing a whistle while dragging a buffalo skull skewered to his shoulder muscles with thongs. Mounted on base of spotted limonite rock.

After the body was assembled, the many small pieces of decoration were first stamped and then sawed out. Each piece was bent, fitted and soldered separately: first the breech cloth , then the leggings, then the shoulder fringe on the shirt and then the fringe on the sleeves. The war bonnet was carefully shaped to fit the head and soldered on. The most difficult part is soldering the full length trailer of feathers down the back of the figure. Finally, the peace pipe was soldered in his hands.

The war bonnet pattern

The full length feather trailer

Binding wire, clamps, props, asbestos blocks and chunks of charcoal were used to hold the pieces of silver firmly in place for soldering. The only solder used was No. 55, made by Leach and Garner. The only flux used was "Handy Flux" .After every soldering operation the figures were put in a solution of pickling compound and then cleaned.

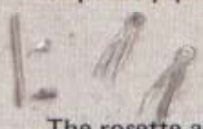
The Hop Boy Rabbi Hunter with a rabbit jus behind him Green tur quoise base

The shirt collar fringe

The Navaj Silversmit filing kato on a anvil. H has movable pliers and ti snips at his side. Turquois base

The leggings

The peace pipe



The rosette and ribbons

The arm fringe

Breech cloth

These are the dies that were used to stamp the designs on the decorations. Many were made especially for this purpose.

The full-skirted Navajo Rug Weaver with her rug on a loom and a basket of balls of yarn beside her. Base of mesquite wood.

THE SILVER GOBLET

A paper pattern should first be made and formed around a tall tumbler in order to get the correct top and bottom curvature. These silver goblets are all 5 inches tall, 2-3/4 inches in diameter at the top and about 2 inches in diameter at the bottom. They are all made from 24 gauge sheet silver and require a piece of silver 6 inches wide and 9 inches long. The bottom is a silver disk 2¼ inches in diameter. The pattern is traced onto the piece of silver; then the silver is cut to the correct curves and angles.

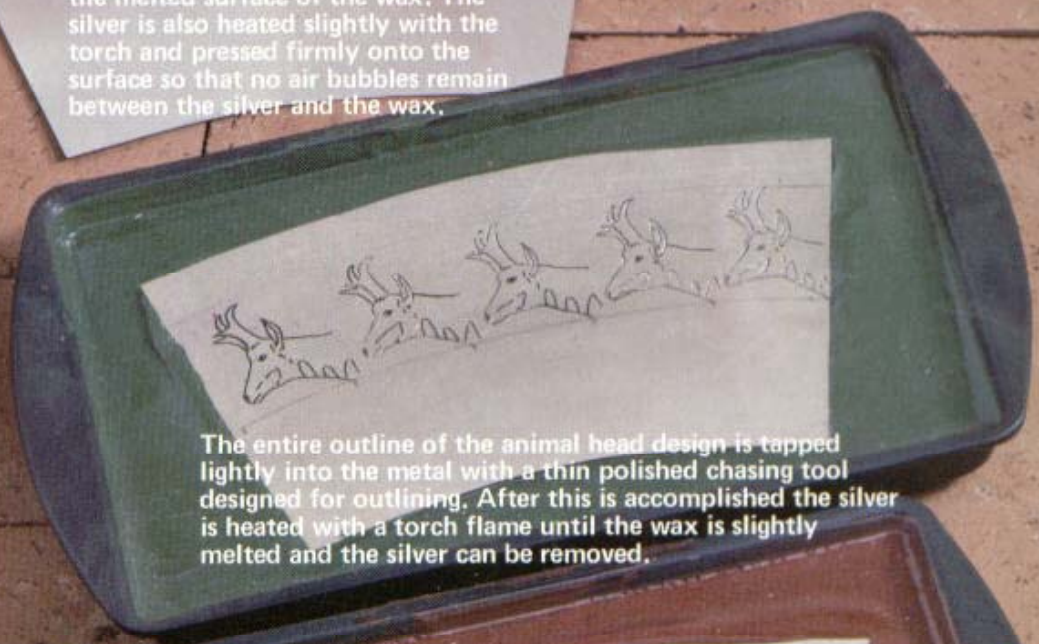
Mountain Lion

Eagle

Prehistoric pottery design

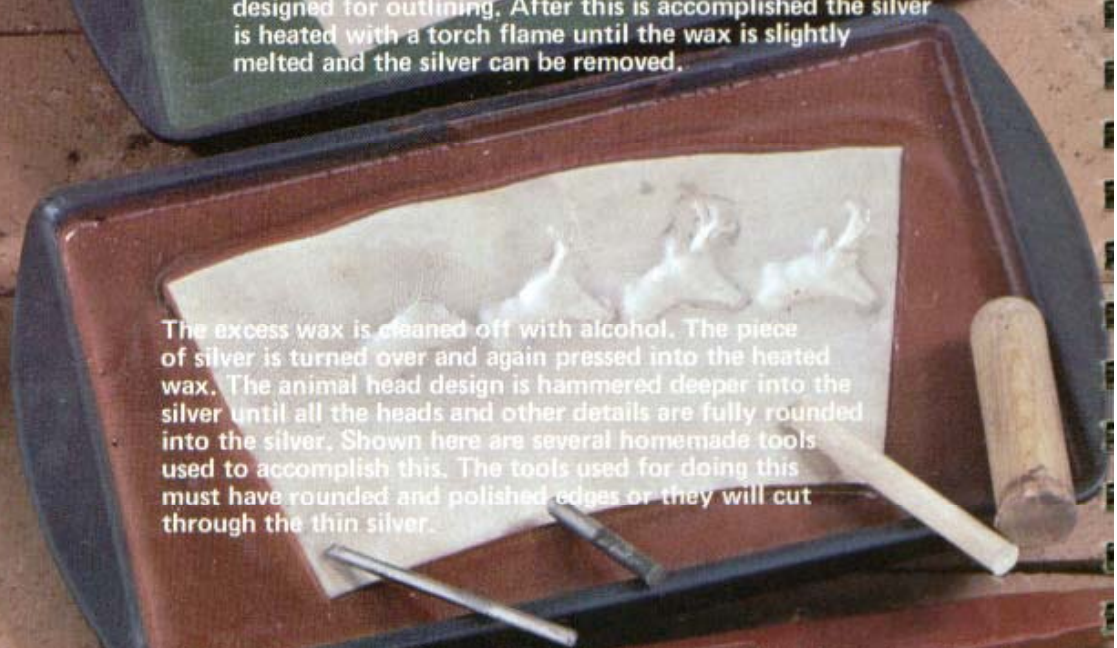
The design for the animal heads is traced onto the silver with a permanent ink. A torch flame is used to melt the surface of the chaser's pitch and the silver is laid on top of the melted surface of the wax. The silver is also heated slightly with the torch and pressed firmly onto the surface so that no air bubbles remain between the silver and the wax.

Big Horn Sheep



The entire outline of the animal head design is tapped lightly into the metal with a thin polished chasing tool designed for outlining. After this is accomplished the silver is heated with a torch flame until the wax is slightly melted and the silver can be removed.

This silver goblet with a turtle design was made by Navajo silversmith Andy Neuman, under the direction of Governor Morris at the Coolidge New Mexico Trading Post in 1945.



The excess wax is cleaned off with alcohol. The piece of silver is turned over and again pressed into the heated wax. The animal head design is hammered deeper into the silver until all the heads and other details are fully rounded into the silver. Shown here are several homemade tools used to accomplish this. The tools used for doing this must have rounded and polished edges or they will cut through the thin silver.

Chaser's pitch may be purchased from the supplier or it can be made from ordinary dopping wax by adding a little beeswax and turpentine to the dopping wax when it is melted. These pans are 1½ x 7 x 11 inch baking pans, which hold about four pounds of wax.

It is a good idea to practice on a copper sheet until one becomes familiar with the techniques required to successfully accomplish a project in repose. The work should be turned over as many times as necessary to expose the correct side for hammering to bring out the design and obtain the proper contour or depth. Each time the work is removed, it will have to be heated with the torch; and each time, the surface of the wax will have to be melted to receive the work. Annealing is also necessary to keep the metal from breaking.

Bear

Buffalo

Copper is a good metal to practice on. This is a reverse.

This is an obverse, or front, on silver. It is to be a box top.

Practice on pieces of scrap silver before each project is attempted.

The designs on the three goblets at this edge of the page wre taken from South American prehistoric gold jewelry

When the figures are completed to your satisfaction, the silver is removed by heating, cleaned with alcohol and annealed. It is then bent around the special wooden mandrel. The end edges are neatly trimmed so they fit perfectly when they are wired together with iron binding wire, then the seam is carefully soldered.

Caution should be used when melting pitch. Melted pitch or dopping wax on the skin can cause severe burns.