JAMES THURMAN

james.thurman@unt.edu
www.JamesThurman.com

1155 Union Circle #305100
UNT College of Visual Arts & Design
Denton, TX 76203

The ULTIMATE COMPILATION of REFERENCES for:

HANDMADE PINS

University of North Texas
College of Visual Arts & Design
Metals & Jewelry
James Thurman

The Ultimate Pin Resource

Compiled from the following resources:

The Theory & Practice of Goldsmithing, Dr. Erhard Brepohl

Practical Jewelry Making, Loosli/Merz/Schaffner

The Complete Metalsmith, Tim McCreight

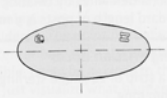
Jewelry: Fundamentals of Metalsmithing, Tim McCreight

Jewelry: Concepts and Technology, Oppi Untract

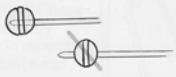
Pin Findings

Pin Findings

Locate pin mechanisms above the central axis to prevent brooches from tipping forward.

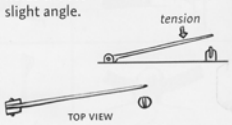


The end of the pin should not extend beyond the catch. Position the catch with the opening downward.



If a pin is too sharp, it will pierce threads and damage fabric. A smooth, bullet-shaped point will find its way between threads. File the proper rounded shape, burnish it to toughen, then polish the pin with rouge.

At rest, the pinstem should be slightly above the catch. This will create a tension that will help keep the pin closed. A similar tension is created by including a stop that holds the stem off the brooch at a slight angle.

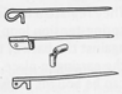


There's process and there's product. If you're too concerned about product, it can get in the way of process.

Mike Myers

Pinstems

Pinstems should be made of a tough metal like low karat gold, nickel silver or stainless steel. Many designs are possible, and each will include a stop that keeps the pin in tension as it fits into the catch. Harden after soldering by twisting the wire.

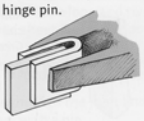


Pin Catches

Pin catches also come in hundreds of styles, and like pinstems, they can be bought or made. Use a tough metal and engineer a catch that is easy to open on purpose but that will avoid coming open by accident.

Pin Holders

Bend the pinholder over a piece of sheet to get the correct fit. After soldering, saw off the curve, and drill holes for the hinge pin.



A Simple Pin

Solder a loop of wire onto the back of a piece, attached at both ends. Snip the wire so one part is larger than the other. Twist the wire to harden it. Curl a spring with round-nose pliers, then file, sand, and burnish the point. Planish the tip of the short piece and curl it into a shepherd's crook. Adjust the gap so the pin stem clicks into place.

Pin Findings

Telescoping Pin Catch

This catch is held closed by the friction of a small pin against the end of the larger tube. To open, rotate the small tube until the pin engages the slot. A short peg keeps the smaller tube from coming all the way out.

1. Make telescoping tubing. The pinstem must fit inside the smaller tube.

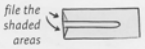
2. Solder a strip of sheet onto the larger tube to lift it off the piece. Cut a slot in the larger tube with a saw. The pinstem must fit here.

3. Solder a thin wire at a right angle to the end of the smaller tube. It is easiest to start with at least an inch of wire, then cut off the excess after soldering.

4. Slide the tubes together and, with the small pin tight against the end, saw the other end off flush. Slide the tubes open and file about ½ mm more off the end of the smaller diameter tube.

5. With the tubes in the open position, solder a knob on the end of the smaller tube. The knob can be made from sheet, bead, or bezel.

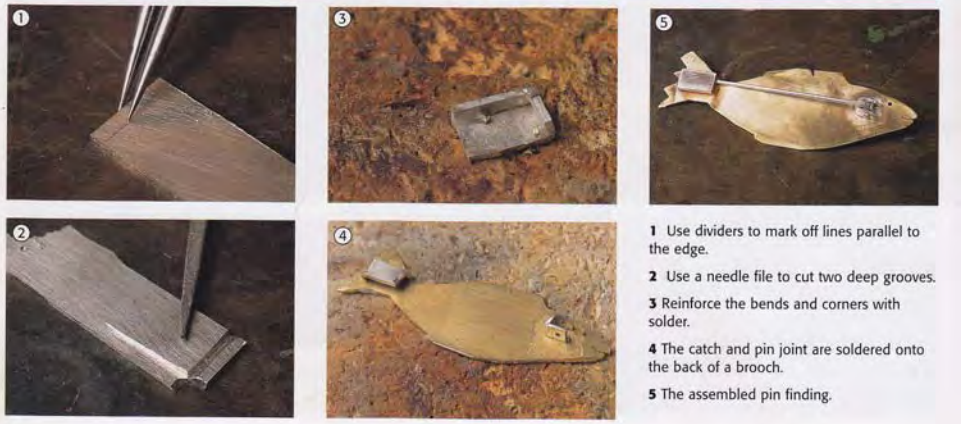
6. File a sloping edge to allow the inner tube to rotate. The friction of the small pin against this edge will keep the catch closed.



Hinge-Style Pin Joint

1. Bend a strip of sheet to make a short length of angle.
2. Solder two small pieces of tube into this, allowing gravity to insure their alignment.
3. Solder a length of wire onto another small piece of the same tube. File a groove to locate the wire, and allow 4–5 mm to extend past the end. This handle makes it easy to twist the wire without damaging it. Snip when the pinstem is hardened.
4. After all soldering and finishing, assemble the finding with a temporary hinge pin. Snip the pinstem to length, remove to shape the tip, then set with a permanent hinge pin. Note that the vertical wall of the angle piece provides the stop that creates tension.

MAKING A BASIC CATCH



1 Use dividers to mark off lines parallel to the edge.

2 Use a needle file to cut two deep grooves.

3 Reinforce the bends and corners with solder.

4 The catch and pin joint are soldered onto the back of a brooch.

5 The assembled pin finding.

12.5
Brooches

12.5.1 FUNCTIONAL ELEMENTS AND DECORATIVE FORMS

Centuries ago when humans were limited to relatively crude techniques for cutting and sewing garments, pins were used to gather and secure pieces onto the body. With the development of tailoring and fasteners, pins have evolved from functional to decorative accessories.

Our most basic understanding of a pin derives from its ancient origins and consists of a thin pointed shaft that easily penetrates fabric, but that has a "head" on the other end to prevent the pin from going all the way through (figure 12.62b). This simple configuration can still be seen today in the form of tie pins (stick pins) and still have the same shortcoming – because there is nothing on the tip, the pin can work itself loose and fall out.

One historically important style of simple pin is called the penannular brooch, shown in figure 12.62c. A section of fabric is gathered up and pulled through the ring where it is speared by the pin. The ring is rotated until the pin lines up with the opening – it is passed through to the top of the ring which is then rotated to cinch it in place. This is particularly effective on thick fabric, which explains its wide use among the Celts of Britain who used it to secure their tartan robes.

Another ancient device (figure 12.62d) is so familiar that it's easy to forget what an important advance it represented in its day. It has remained unchanged through thousands of years, which says a lot about the effectiveness of the design. Safety pins can be made of almost any size wire, though most fall between 1 and 2 millimeters. One end is filed to a point and the other is forged to widen it. This section is bent into a scoop as shown to contain the tip of the pin. The springiness is determined by the type of wire used and its degree of work hardening.

We will go on to discuss more elaborate catches, but it is worth noting that this simple pin has all the ingredients we will find in more sophisticated pins: a pointed stem, a hinged section, and an enclosing catch.

The last drawing in figure 12.62 shows an early variation of the safety pin called a fibula. The pin, spring and bow are typically forged from a single piece. In this case the catch has been soldered on.

Of course it is still possible to make fibula; a contemporary example is shown in figure 12.63. Far more common, however, are pins in which the holding apparatus is distinct from the piece of jewelry, generally created or purchased as a separate finding that is attached to the back in such a way that it is invisible when the pin is being worn.

As mentioned above, a pin back system consists of the pin, a hinge-like element called the joint, and a

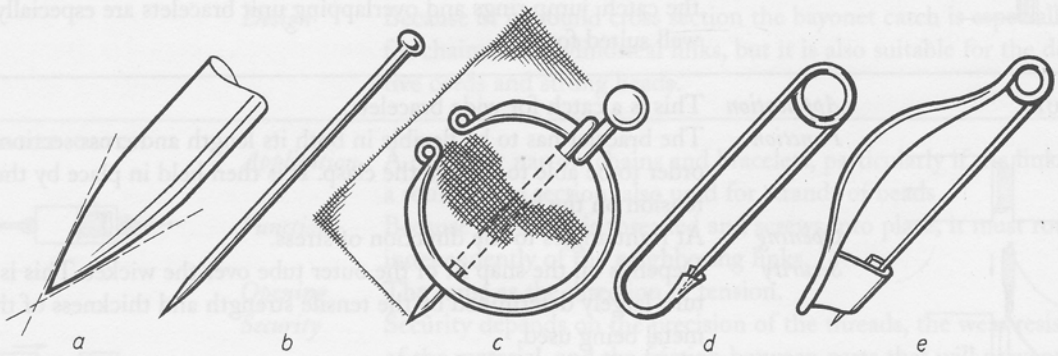


Figure 12.62
a) shows the ideal "bullet" point for a pinstem, c) shows a traditional penannular brooch, d) shows a classic fibula design in both its ancient and modern versions.

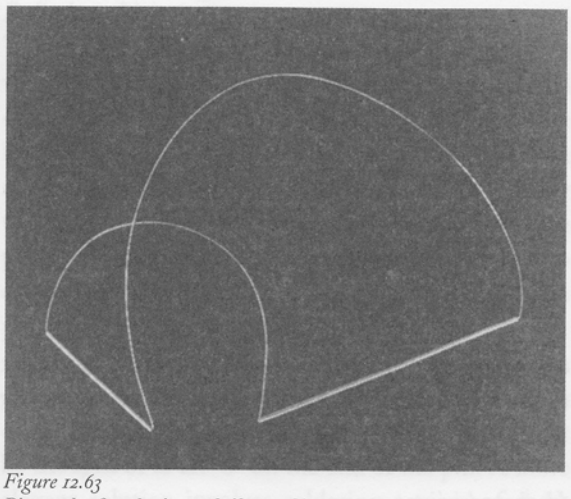


Figure 12.63
Pin made of steel wire and silver tubing.

catch. These components are manufactured in equal quality and far cheaper than it would be possible to make them by hand Accordingly they are used not just in mass produced jewelry but also with one-of-a-kind pieces. The decision to attach a manufactured pin back onto a hand made piece of jewelry it is always a judgment call as to whether it can be unified with the sensibility of the piece. In certain cases there will be the need to make the finding by hand so that it integrates in shape, size and proportion to the unique object. With this in mind, some traditional pin systems are described here.

There are some principles and obvious rules that arise from the function of a pin back system, and even though they should be part of a goldsmith's basic knowledge they are not always completely clear, particularly with younger colleagues (figure 12.64).

- Pins are made to be pushed into the material with the wearer's right hand. Therefore on the back of a brooch the joint should lie on the right and the hook on the left when they are soldered on.
- The opening of the hook should always face down. If the safety should open, the point is still held into the hook by the force of gravity upon the brooch.
- The joint and hook catch are positioned above the center axis of the pin. This will prevent the pin from tilting forward when being worn.
- The joint and hook catch should be just high enough off the pin to allow a gather of fabric to fit easily beneath. From this it follows that pins intended for heavy fabric like coats will need taller findings than pins intended to be worn on a sheer blouse.
- When the pinstem is engaged in the catch it should lie parallel to the back of the brooch (d).
- The pinstem should be able to open wide enough to make it easy to position, typically as much as 90°, as seen in (b).
- The pin is bent slightly at the joint to create tension when the tip is contained in the hook. Though subtle, this provides a surprising amount of security in even simple catches.

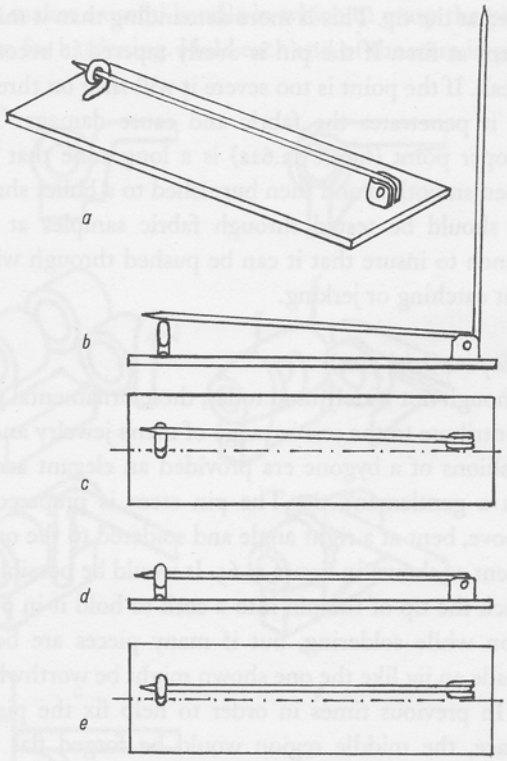


Figure 12.64
A basic pin mechanism.
b) illustrates that the pinstem is under tension at rest, c) shows the location of the stem above the midline of the brooch.

12.5.2 PINSTEMS AND JOINTS

Virtually all pinstems are made of round wire, often the same alloy as used to make the piece. An exception is the use of nickel silver on sterling objects, where the base metal provides increased toughness and spring. If the pin is attached by a mechanical means (like a rivet) it does not need to be taken into consideration when stamping the quality of the alloy.

Most pinstems will have a diameter of 1.2–1.5 mm (18–16 gauge) but of course each situation must be considered individually. Where the pinstem is longer or the pin heavier it might be wise to increase the diameter of wire being used.

The simplest attachment for a pinstem is to simply bend a loop at the end. More sophisticated arrangements will attach a piece of sheet or a section of tubing to provide the hinge pivot. When this is attached the pinstem is cut to the correct length and a point is filed at the tip. This is more demanding than it might seem at first. If the pin is overly tapered it becomes weak. If the point is too severe it will snag on threads as it penetrates the fabric and cause damage. The proper point (figure 12.62a) is a long cone that has been smoothed and then burnished to a bullet shape. It should be tested through fabric samples at the bench to insure that it can be pushed through without catching or jerking.

Tie pins (*stick pins*)

Though not widely used today, these ornamental pins contribute to the scarce range of men's jewelry and in fashions of a bygone era provided an elegant accent on a gentleman's tie. The pin stem is prepared as above, bent at a right angle and soldered to the ornament as shown in figure 12.65. It would be possible to stick the tip of the pin into a cork to hold it in position while soldering, but if many pieces are being made an jig like the one shown might be worthwhile.

In previous times in order to help fix the pin in place, the middle region would be forged flat and twisted. This increases the friction of pin against the fabric, but has the disadvantage of widening the hole and possibly damaging the cloth. A modern variation is the addition of a spring-loaded clutch that attaches over the tip of the pin. This protects the point against accidentally poking the wearer and makes it impossible for the pin to fall out by accident.

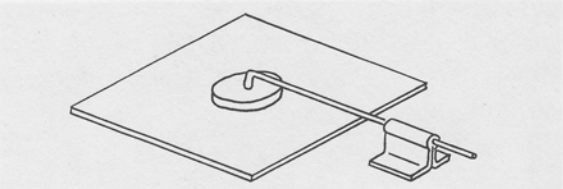


Figure 12.65
Soldering a stick pin finding in place with the aid of a holding jig.

U-shaped joints

The joint (or hinge component) is shown in its assembled side view at the top of figure 12.66a. This version is bent up from a single strip of sheet, filed and drilled to accept a small bit of wire that passes through the pinstem. As shown in the accompanying drawings, a flattened jump ring is soldered onto a wire to complete the pinstem. The finding can be lightened and made more graceful by cutting away a small section on the underside as shown.

The location of the hole should be such that when the units are temporarily assembled, the pin sticks dramatically upward. Use a round file to take material away from the bent section of the joint (the bottom of the U) until the pinstem lays down almost flat. Tension on the pin is created by forcing the stem to bend slightly as it is hooked into the catch. If the pin sticks up too far, this effort will bend the pin and defeat the purpose. In practice it is a simple matter to check the tension frequently during filing.

A simplified version of this joint is created by soldering a U-shaped piece so it is the bottom of the U that is in contact with the pin. This arrangement does not provide a surface against which the pin pushes, and therefore does not provide the upward tension just mentioned. To create this a short length of wire is soldered to the pinstem near the joint, coming off at a right angle. This is trimmed to a length at which it stops the pin at the appropriate height.

Ball-shaped joints

This joint looks nicer than a simple U-bend joint with its rounded sides and it fits better with the ball catch that is frequently used (figure 12.66b). Saw the basic shape from sheet that is one millimeter thick and bend it around a piece of stock that is slightly thicker. Drill a hole through both sides and round the piece with a file. File a flat facet on the bent area to create a soldering surface and attach the piece to the pin, again locating it above the center line.

Because this pin joint does not have a stop for the pin, a foot must be added to the pinstem itself. This can be as simple as a bend of wire, leaving what might be thought of as an "S" on the end of the pin. A more elegant solution involves soldering a piece of sheet metal to the stem and shaping it as shown in figure 12.66b.

Hinged joint

Measure a short piece of tube into three equal segments and cut each line with a fine sawblade, stopping when the cut is about ¾ths of the way through. File away the middle segment, leaving only a bridging strut that connects to two end pieces (figure 12.66c). The "bridge" will hold the knuckles in alignment and prevent their sliding closer together or further apart.

Prepare a shallow groove to accept the knuckles, wire the piece into position and solder it in place, either directly onto the pin or onto a thick piece of stock that will then be attached to the pin. When the solder is complete and confirmed, saw away the connecting strut.

Take a small piece of the same tubing, slightly longer than the gap between the two knuckles, and solder it to the pinstem. The joint will be made stronger by first filing a groove into the tube. Allow the back end of the stem to project beyond the tube; this makes a useful handle in which to grasp the pinstem for hardening. Hold each end of the stem in pli-

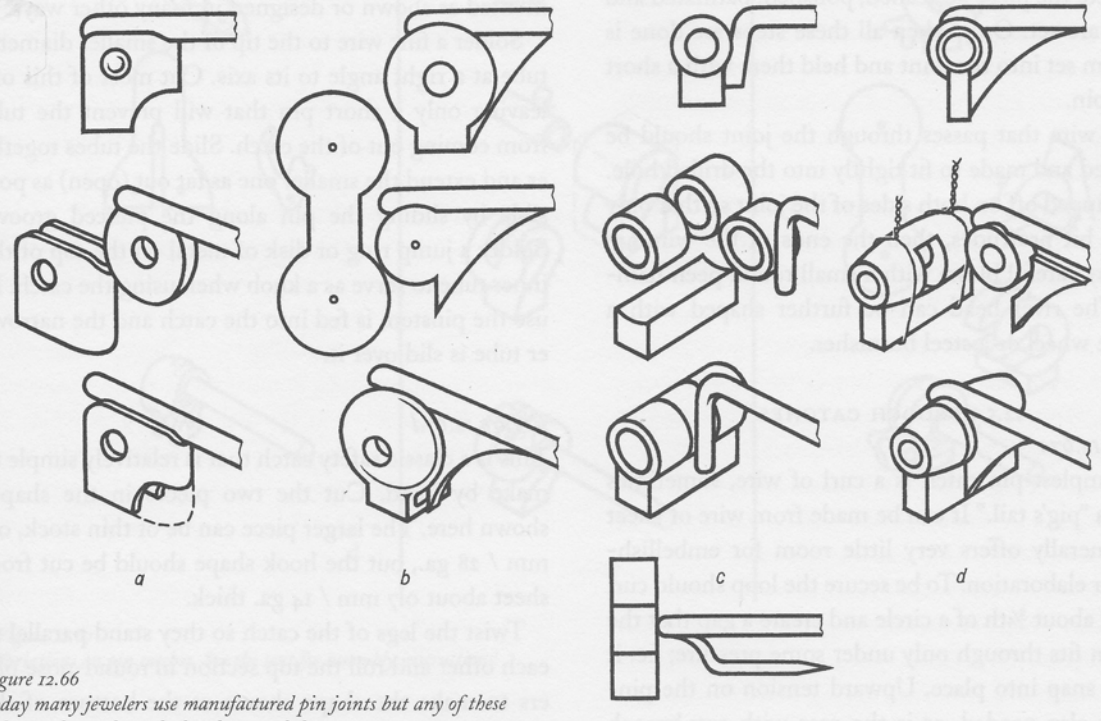


Figure 12.66
Today many jewelers use manufactured pin joints but any of these styles can be made at the bench as needed.

ers or a pin vise and rotate the wire to harden it. To complete the final fit, file the ends of the middle knuckle until it just fits between the outer two.

Barrel hinge (*barley grain hinge*)
This elegant variation of the hinged joint involves considerable work, so its use is reserved for the most expensive work (figure 12.66d). Start with a thick-walled tube or create your own by repeated drawing down. Cut off a section and file it to a barrel shape. Prepare a seat to accept this shape and solder the pieces on as described above. A foot is soldered to the wire that will become the pinstem and a length of the tubing is attached at a right angle. It is filed until it fits smoothly between the outer knuckles.

Hinge rivet and pin
The pin joint and catch are soldered on late in the assembly process, but the true completion of the pin is left until almost the last step. After all soldering is complete the piece is cleaned, polished, patinated and stones are set. Only when all these steps are done is the stem set into the joint and held there with a short hinge pin.

The wire that passes through the joint should be annealed and made to fit tightly into the drilled hole. It is snipped off on both sides of the joint so that only a little bit protrudes, then the ends of the wire are upset by careful blows with a small round peen hammer. The rivet head can be further shaped with a pumice wheel or a steel burnisher.

12.5.3 BROOCH CATCHES

Figure 12.67a
The simplest pin catch is a curl of wire, sometimes called a "pig's tail." It can be made from wire or sheet but generally offers very little room for embellishment or elaboration. To be secure the loop should curl around about ¾th of a circle and create a gap that the pinstem fits through only under some pressure; i.e. it should snap into place. Upward tension on the pinstem is also needed, as is the case with any brooch finding.

Figure 12.67b
From a thin sheet (0.3 mm or 28 ga.) cut out a shape like the one shown here, third shape from the top in the center column. This is bent to shape with a combination of work with pliers and dapping punches to create a bracket that will enclose the pinstem. The catch is then soldered on to the back of the brooch.

Solder a small section of tubing just in front of the catch as shown and insert through it a small wire that has had one end drawn to a bead. Bend the wire so its two legs cross – they will catch the pinstem and press it firmly into the catch area. To release, the crossed wire is flipped down flat on the brooch.

Figure 12.67c
This elegant catch captures the pinstem and protects it inside a tube that slides open for release. Start with a pair of tubes that slide one inside the other. Cut a slot in the larger diameter tube about ⅔rds of its length and attach the tube to a short leg of some sort to lift the finding up off the brooch. This can be ornamented as shown or designed in many other ways.

Solder a fine wire to the tip of the smaller diameter tube at a right angle to its axis. Cut most of this off, leaving only a short pin that will prevent the tube from coming out of the catch. Slide the tubes together and extend the smaller one as far out (open) as possible by sliding the pin along the pierced groove. Solder a jump ring or disk of metal on the top of the inner tube to serve as a knob when using the catch. In use the pinstem is fed into the catch and the narrower tube is slid over it.

Figure 12.67d
This is a classic safety catch that is relatively simple to make by hand. Cut the two pieces in the shapes shown here. The larger piece can be of thin stock, 0.3 mm / 28 ga., but the hook shape should be cut from sheet about 0.7 mm / 14 ga. thick.

Twist the legs of the catch so they stand parallel to each other and roll the top section in round-nose pliers to make the shape shown at the bottom of the drawing. Drill a hole through both sides of the catch

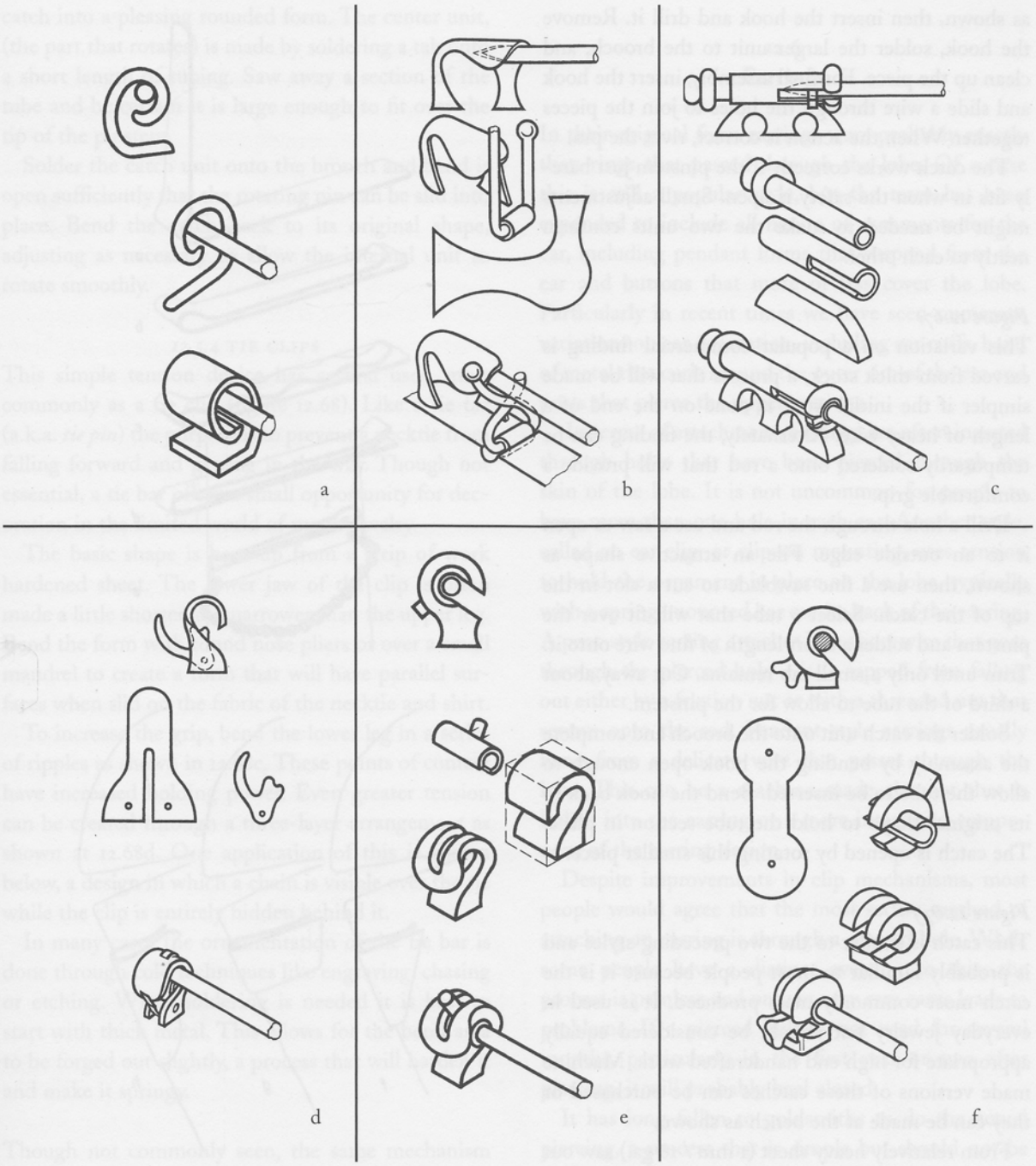


Figure 12.67
Variations on pin catches. See the text for assembly instructions.

as shown, then insert the hook and drill it. Remove the hook, solder the larger unit to the brooch, and clean up the piece. For final assembly, insert the hook and slide a wire through the holes to join the pieces together. When the action is correct, rivet the pin.

The catch works correctly if the pinstem just barely fits in when the safety is open. Small adjustments might be needed to make the two units conform neatly to each other.

Figure 12.67e

This variation on a popular commercial finding is carved from thick stock, a process that will be made simpler if the initial work is done on the end of a length of heavy wire. Alternately, the finding can be temporarily soldered onto a rod that will provide a comfortable grip.

Drill a hole through the rod and use a saw to open it to an outside edge. File an attractive shape as shown, then use a fine sawblade to cut a slot in the top of the catch. Select a tube that will fit over the pinstem and solder a short length of fine wire onto it. Trim until only a small tab remains. Cut away about a third of the tube to allow for the pinstem.

Solder the catch unit onto the brooch and complete the assembly by bending the hook open enough to allow the tube to be inserted. Bend the hook back to its original shape to hold the tube section in place. The catch is opened by rotating this smaller piece.

Figure 12.67 f

This catch is similar to the two preceding styles and is probably familiar to most people because it is the catch most commonly mass produced. It is used in everyday jewelry but should be considered equally appropriate for high end handcrafted work. Machine made versions of these catches can be purchased or they can be made at the bench as shown.

From relatively heavy sheet (1 mm / 18 ga.) saw out the "barbell" shape shown in the illustration. File the connecting section thinner and bend the piece into a U shape with the two disks laying parallel. File the

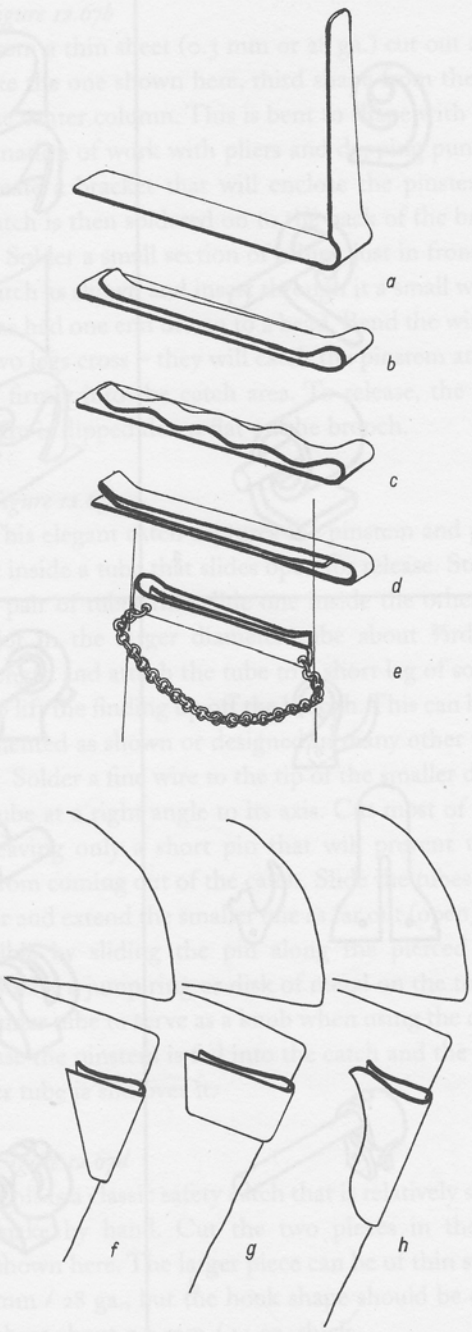


Figure 12.68
Tie and lapel clips.
a) bent spring clip, b) flat spring clip, c) rippled spring clip, d) double spring clip, e) double spring clip with decorative chain, f) to h) reverse side of lapel clips.

catch into a pleasing rounded form. The center unit, (the part that rotates) is made by soldering a tab onto a short length of tubing. Saw away a section of the tube and be certain it is large enough to fit over the tip of the pinstem.

Solder the catch unit onto the brooch and bend it open sufficiently that the rotating pin can be slid into place. Bend the catch back to its original shape, adjusting as necessary to allow the internal unit to rotate smoothly.

12.5.4 TIE CLIPS

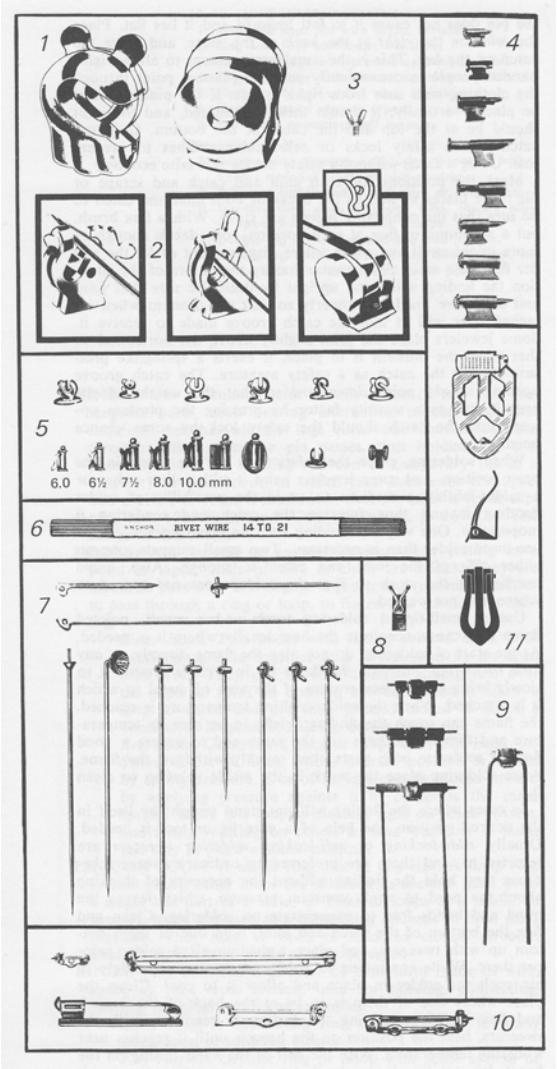
This simple tension device has several uses, most commonly as a tie clip (figure 12.68). Like a tie tac (a.k.a. *tie pin*) the purpose is to prevent a necktie from falling forward and getting in the way. Though not essential, a tie bar offers a small opportunity for decoration in the limited world of men's jewelry.

The basic shape is bent up from a strip of work hardened sheet. The lower jaw of the clip is often made a little shorter and narrower than the upper leg. Bend the form with round nose pliers or over a small mandrel to create a form that will have parallel surfaces when slid on the fabric of the necktie and shirt.

To increase the grip, bend the lower leg in a series of ripples as shown in 12.68c. These points of contact have increased holding power. Even greater tension can be created through a three-layer arrangement as shown at 12.68d. One application of this is shown below, a design in which a chain is visible over the tie while the clip is entirely hidden behind it.

In many cases the ornamentation of the tie bar is done through cold techniques like engraving, chasing or etching. When soldering is needed it is best to start with thick metal. This allows for the bend area to be forged out slightly, a process that will harden it and make it springy.

Though not commonly seen, the same mechanism can be used to create clips for other places on garments such as shirt collars, jacket lapels and so on. These can be of almost any size and either quite plain or very fancy.



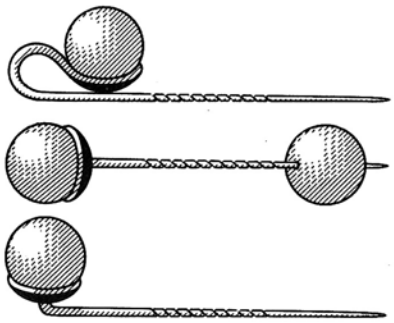
19–14 *FASTENINGS: Brooch findings*

1. *Matching catch with safety lock,* and *joint,* for hard soldering.
2. *Self-locking catch* whose latch closes when the pinstem is pressed down into the notch, and *joint* with internal posts, whose sides when pressed permanently engage the hole in an inserted pinstem and hold it in place.
3. *Catch* and *joint* with *screw bases.*
4. *European-type catch* in assorted sizes, consisting of a horizontal cylinder first pulled out by a head to allow the entry of the pinstem, then pressed to return it in place to hold the point locked within the cylinder.
5. *Catches and joints with patches,* designed for soft soldering, but when made of silver or gold, usable for hard soldering as well.
6. *Rivet wire,* assorted sizes, used to hold the pinstem to the joint.
7. *Pinstems,* various lengths, used with catch and joint of proportional size; with hole and pressure cam; attached pins; screw ends; and other systems used in Europe.
8. *Safety lock,* European style, soldered by a patch to a brooch back just below the pinstem, used to engage a pinstem when used with an ordinary, simple wire hook. After the pinstem is inserted and engaged with the hook, the hook is lifted upward, grasps and holds the pinstem under pressure against itself.
9. *Double pinstem findings,* French, with various joint systems.
10. *One-piece assembled brooch finding* with safety catches, used for soft soldering.
11. *Brooch clips* with spring device, demountable for hard soldering.

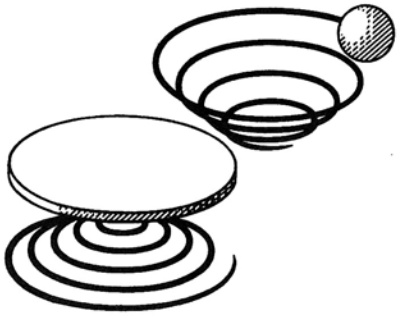
33 Pins and buttons

as basic elements

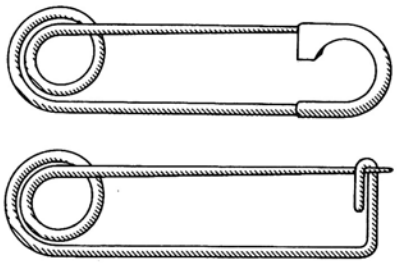
One-piece items



Pins

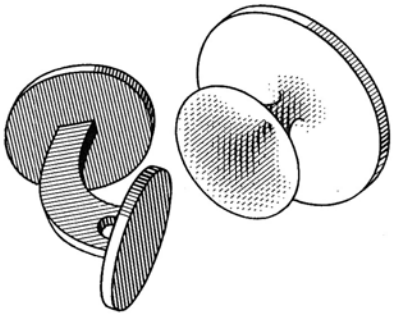


Spiral pins

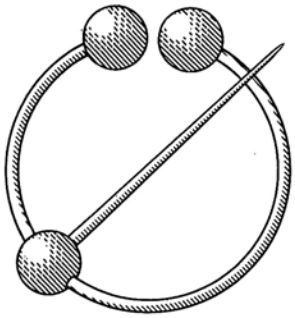


Safety pins

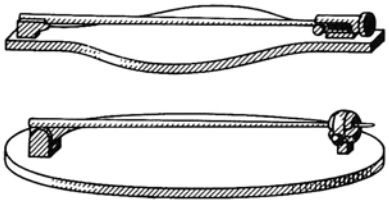
Two-part items



Buttons (cufflinks with crosspiece)



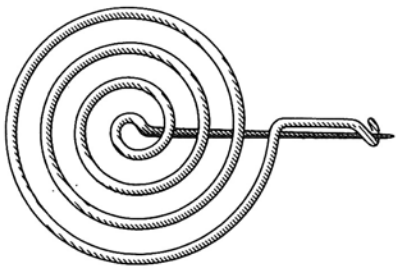
Fibula



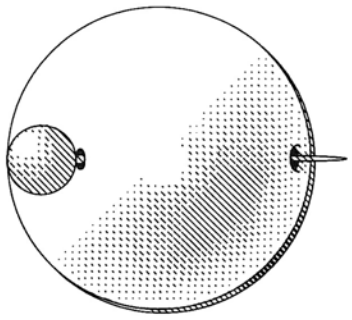
Brooches

Observe:
- the relationship between the nature of a given metal and its hardness
- appropriate pin thickness in relation to the metal used
- the shape of the point of the pin
- the possibilities of creation offered by pins and buttons

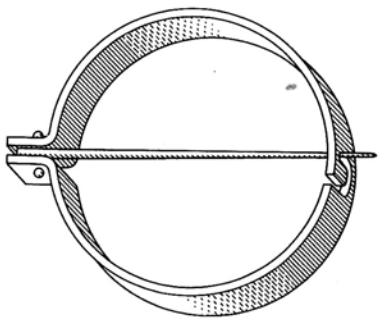
Possibilities of creation



One-piece



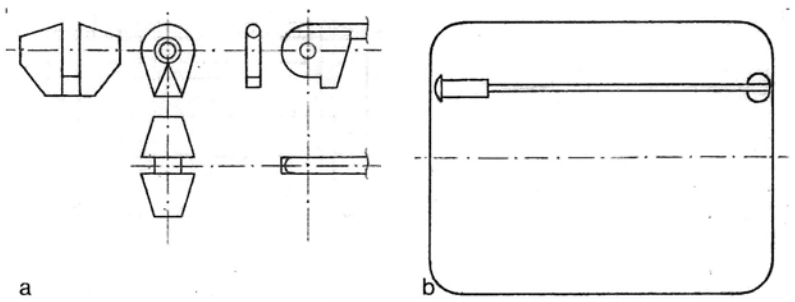
Two detachable parts



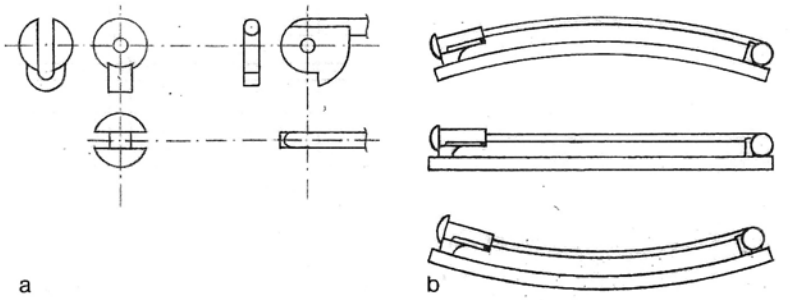
Two assembled parts

33 Pins

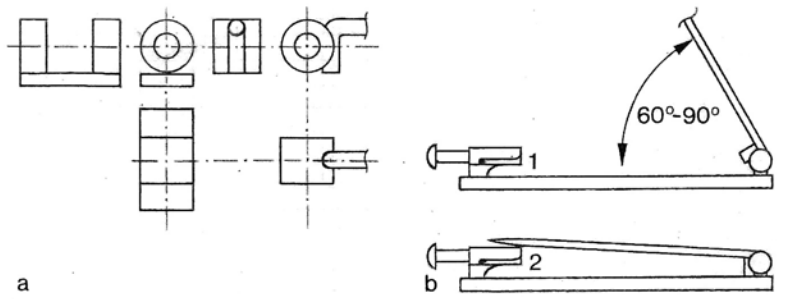
a) Barrel hinge with sliding part
b) Brooch pin, fixed in the upper third of the plate



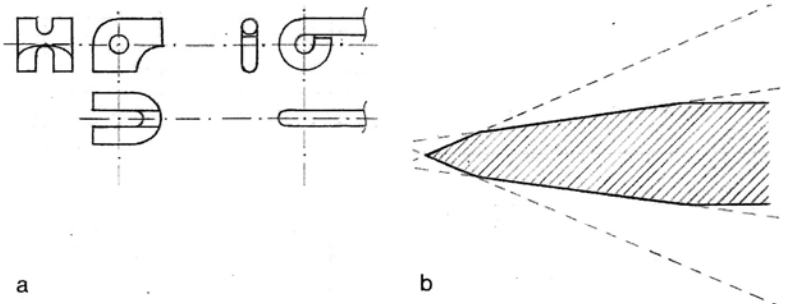
a) Ball hinge with sliding part
b) Brooch pins, adapted to the shape of the item



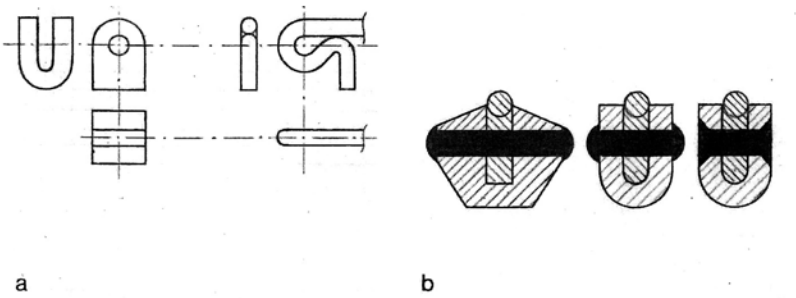
a) Block hinge with sliding part
b) 1. Opening angle 60°–90°
2. Stopping position of pin



a) Cheek hinge with sliding part
b) Shape of pin point



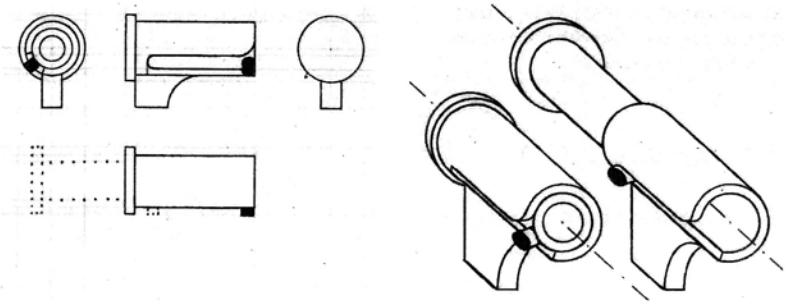
a) Cheek hinge with sliding part
b) Riveting systems



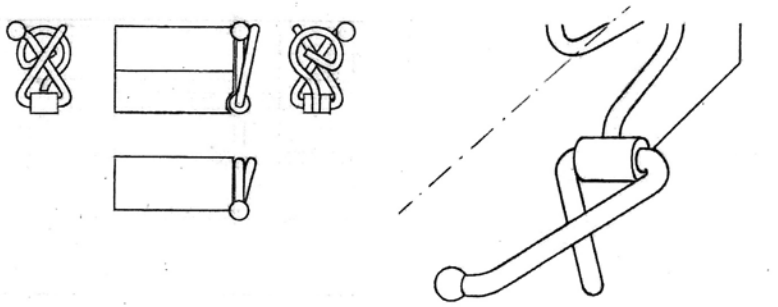
Basic objects

33 Pins

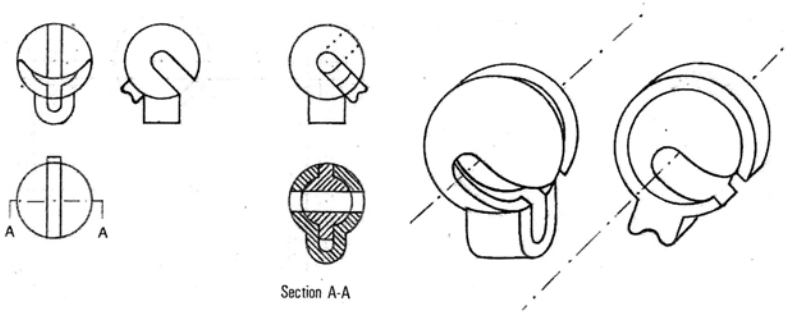
Pull-out fastener



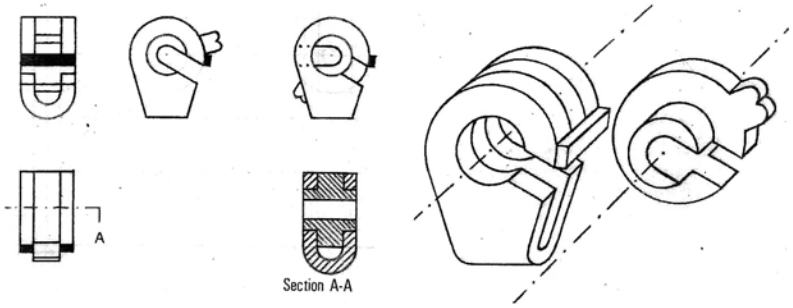
Safety fastener



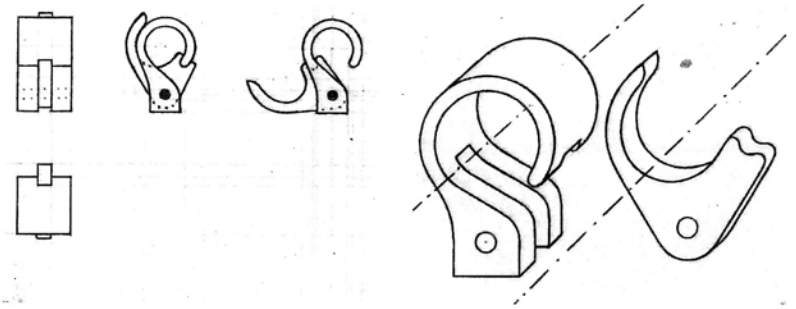
Ball fastener



Turn fastener

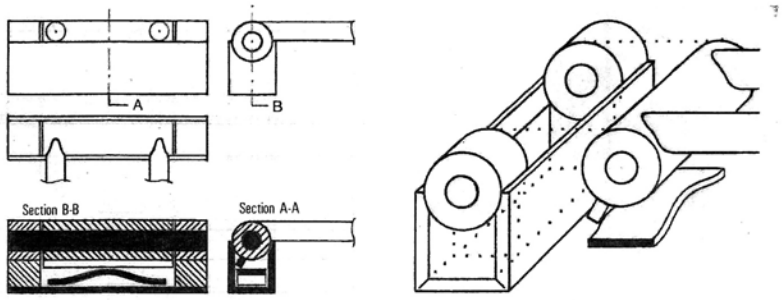


Fastener with locking hook

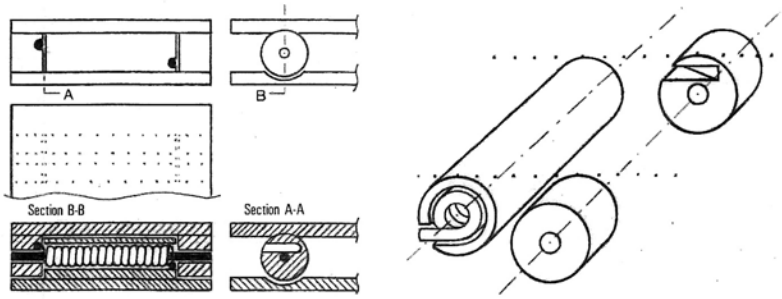


34 Clips

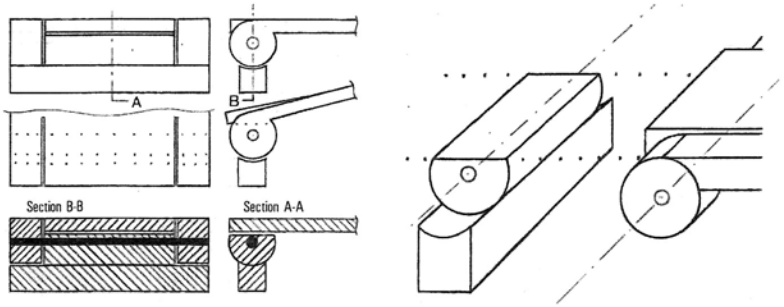
Clip system with leaf spring



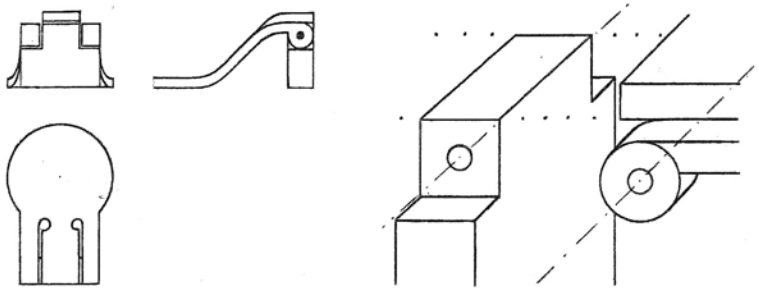
Clip system with spiral spring



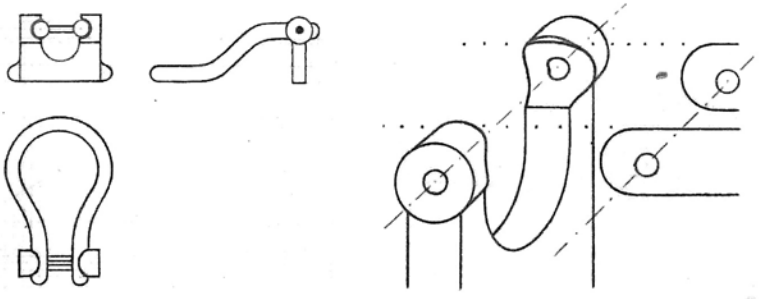
Clip system with spring effect by clip elements (hidden spring)



Earclip system with spring effect by clip elements



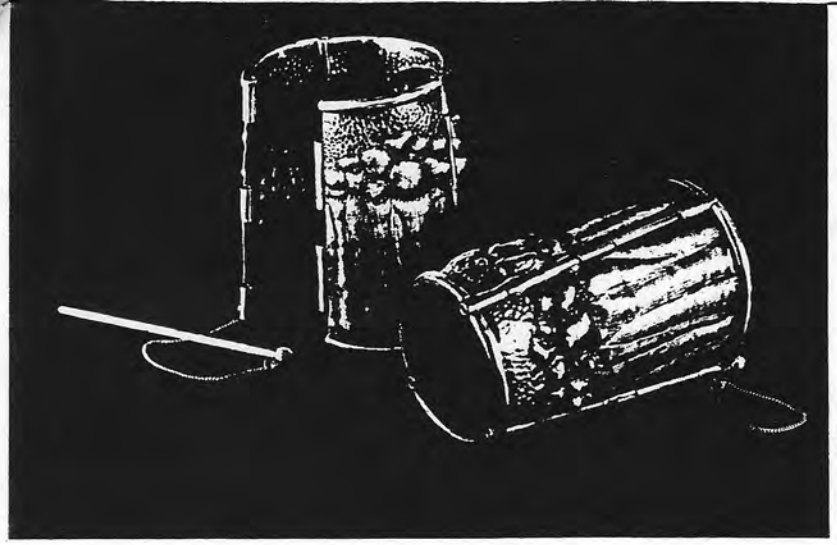
Earclip system with spring effect by bow element



Armaturen: I

(Halterungen, Verschlüsse, Klipmechaniken, Bewegungen)

Lfd. Nr.	Ausgangsmaterial (Rohmaß)	Metallstärke (mm)	Endzurichtung (Fertigung)	Schnitt (vereinfacht)	Isometrische Darstellung	Benennung
1	2 × 12	0,5-0,6	gefeilt eingefeilt gelötet		Zunge	Broschhaken
2	9 × 4	0,5-0,6	gebogen gebohrt gefeilt		Widerlager	Broschscharnier (Böckchen)
2 a)	Länge nach Abstand von Scharnier u. Broschhaken	Ø 0,9-1,0	Öse gebogen nicht löten Spitze gefeilt			Broschnadel
3	3 × 12; 5 × 6	0,8; 0,6	Schlitz eingesägt			Haken mit Sicherung
4	9 × 6	0,6	feilen einfeilen biegen Löten			Scharnier mit Stützplatte
4 a)	Länge nach Bedarf	Ø 0,9				Nadel mit Widerstandsfuß
5	22 × 7; 6; 7 × 3	0,25; 0,20; 0,6	äußeres inneres Scharnier Fuß Deckplatte		Arretierungsstift	Schiebesicherung
6	5; 22 × 8	0,5; 0,5	einfeilen sägen Scharnier nicht schließen			Rohrhaken
7	9 × 3	0,6				Scharnier mit Anschlagplatte
7 a)	Länge nach Bedarf 4 × 3	Ø 0,9-1,0; 0,6				Nadel und Platte mit Widerstandsnase

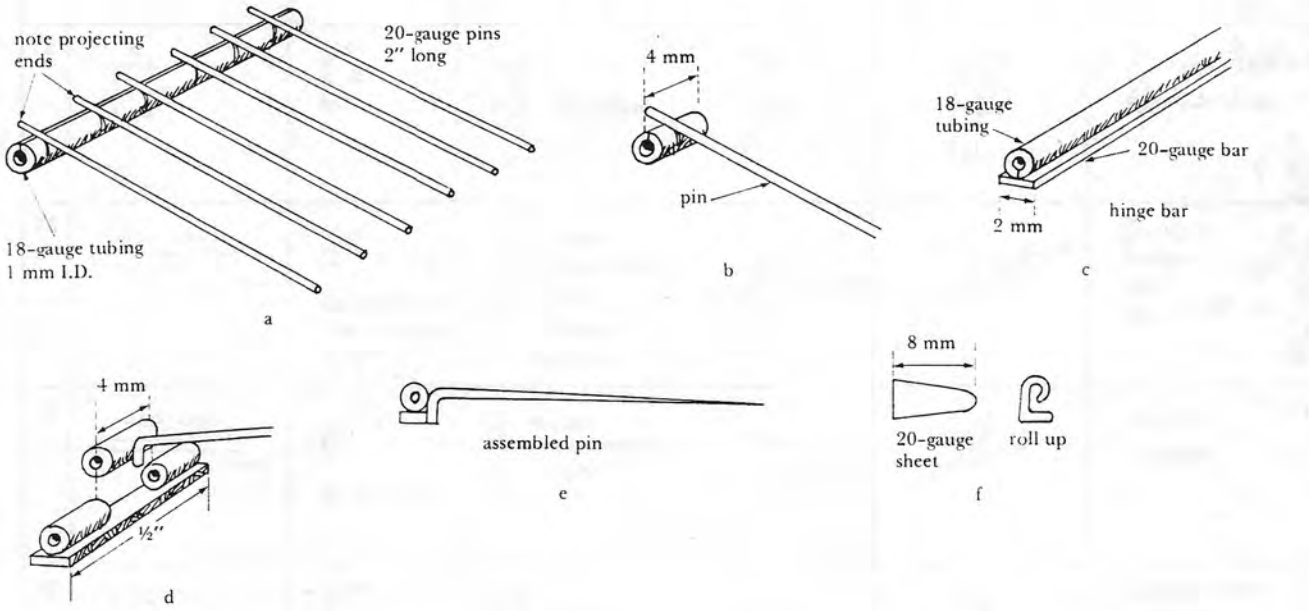


433. Anne Echelman. Pair of silver cuff bracelets, repoussé and chased, 1975.

Displacement can be made possible by a slide, hinge, twist, radial rotation, or a spring (Fig. 433).

15.10

Silversmith Pin Set A pin set requires a pin tong, a hinge to fasten it to the back of a jewelry piece, and a clasp to hold it in place (Fig. 434). One method for quantity-producing pin sets rests soundly in silversmith tradition: Make a sterling-silver tube (**11.3**) about $3\frac{1}{4}$ inches long, and draw it down to a 1-millimeter inside diameter (I.D.). This should yield an outside diameter (O.D.) of about 2 millimeters (roughly $\frac{3}{32}$ inch) if you start with a strip of 20-gauge sterling. Remember that when you draw a tube down to a smaller size, the tube wall thickens.



434. Procedure for multiple production of silversmith pin sets, provided by Heikki Seppa: Several pin tongs are soldered at regular intervals to a length of tubing (*a*), which is then cut apart (*b*). A length of identical tubing is soldered to a bar (*c*) and cut to form a three-section hinge with the pin (*d*), whose projecting end is bent down to provide spring tension against the bar (*e*). Finally, a simple clasp is rolled from sheet (*f*) and positioned on the work to receive the pin tong (*g*).

University of North Texas
College of Visual Arts & Design
Metalsmithing & Jewelry
James Thurman

REFERENCE MATERIAL

HANDMADE PIN BACK SAMPLES

Andy Cooperman

- Notice forged end of spring arm

Ken Bova

- Second tube increases tension against catch
- Spring arm bent first, then bend pin stem 90 degrees to lock in

Ken Bova

- Removable pin stem enables piece to be easily converted into a pendant

Ken Bova

- Center acts as spring arm