Rounded-mandrel ground-layer pin forming jig

Bend a repeatable smooth U-shaped ground-layer pin around two small mandrels, keeping bend radius and leg spacing controlled instead of making sharp hand-plier corners.

Capacity and fit

One pin per cycle from annealed 1/8 in stainless wire. Target centerline straight top span 3 in, bend centerline radius 1/4 in, straight legs 6 in. Approximate outside width 3 5/8 in and height 6 5/16 in; finished tolerance 1/16 in.

Limits

Pins hold a suitable low branch near soil; they must not clamp bark. Select the crop and layering procedure separately.

No fence, anchor or lifting capacity. Do not bend spring-tempered wire, galvanized fence wire of unknown temper or wire with sharp burrs.

Finished component envelope

10 x 8 x 3/4 in / 254.0 x 203.2 x 19.0 mm (x, y, z). Solid-part envelope; operating sweep and loose purchased accessories excluded. Axes: x left-right, y front-back, z up.

Cut list - actual dimensions

Part / quantity	Finished L x W x T / material
P01 / Jig base / 1	10 x 8 x 3/4 in / 254.0 x 203.2 x 19.0 mm. Exterior plywood, measured actual thickness as listed; seal cut edges outside plant-contact surfaces

Hardware and consumables

- Two purchased steel spacers: 1 in long, 3/8 in OD, 1/4 in bore, smooth outside

- Two 1/4-20 x 2 1/2 in bolts, four washers and two locknuts

- Annealed 1/8 in stainless wire, cut 15 13/16 in per pin; one pin is an output of this jig, not another counted project

- Two bench clamps; two end caps or rounded covers for exposed bolt threads

Tools

Tape measure and combination square; Pencil, clamps and safety glasses; Saw with wood blade; drill/driver and piloting bits; 120- and 180-grit abrasive; Wire cutters rated for the selected stainless wire; Two smooth-jaw bending pliers and a fine file; 9/32 in drill bit.

Fastener direction and joint schedule

- Mandrel bolts pass through 3/4 in base plus 1 in spacers; washers and locknuts complete the stack. The wire is bent around smooth spacers, not bare threads.

Build sequence

01. Cut the base and mark its front edge. The pin legs will extend past this edge during bending; leave clear bench space below it.

02. Mark both mandrel centers at y = 4 in, x = 3 1/4 and 6 1/4 in. Their 3 in center spacing sets the straight top span.

03. Drill both 9/32 in holes perpendicular to the base. Deburr and confirm the 1/4 in bolts pass without force.

04. Insert bolts from below with washers. Fit smooth 1 in spacers above the base, then washers and locknuts; tighten without crushing the plywood.

05. Cover exposed bolt threads above the nuts. Check the working 1 in spacer height is smooth and free of burrs.

06. Clamp the base at both rear corners. Cut one 15 13/16 in length of annealed wire with rated cutters and file both ends hemispherically smooth.

07. Mark the wire midpoint and align it halfway between mandrels on their far side. Keep the wire flat against the base.

08. Bend each side around its mandrel with smooth-jaw pliers, making two approximately 90 degree corners. A 3/8 in mandrel plus 1/8 in wire gives a 1/4 in centerline bend radius.

09. Remove the pin, compare leg lengths and trim only enough to equalize them within 1/16 in. File new ends smooth and check the approximate outside dimensions.

10. Trial the pin in loose soil over a scrap dowel. Stop insertion while a clear gap remains above the dowel; then use only with an appropriate low branch and check it does not rub bark.

Acceptance checks

- Mandrel centers are 3 in apart; both are vertical and cannot rotate loose under hand bending.

- Pin legs are parallel, ends smooth and not pointed toward exposed footpaths.

- Installed pin retains clearance over the branch and does not pinch it as the soil settles.

Use

- Push by hand into prepared loose soil; do not hammer the pin or use it to pull a branch downward forcibly. Mark its location to avoid stepping on it.

Care

- Remove after rooting or when no longer required, wash soil off and inspect for kinks or sharp corrosion. Retighten jig hardware as needed.

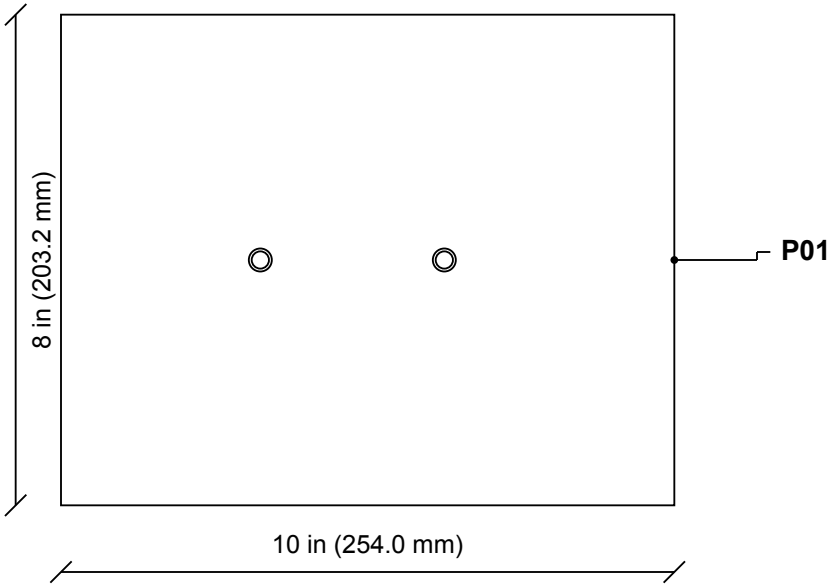
Primary context sources

Iowa State University Extension: How to Propagate Shrubs by Layering. Simple/tip and mound-layering context. No hormone, fertilizer or universal rooting schedule supplied.

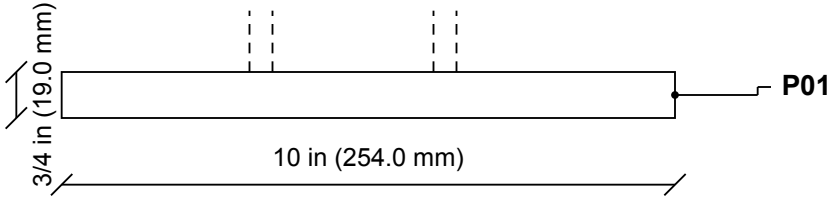
OR-004 / ASSEMBLY VIEWS

Combined tags mark coincident profiles. Repeated members share one callout. P-numbers match the cut list.

PLAN / x-y



FRONT / x-z

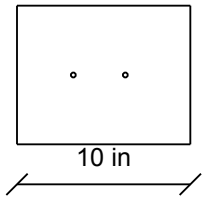


Geometry is schematic orthographic projection. Working clearances and fastener directions are specified in the text.

No scale measurement from this sheet. Use written dimensions. Unbuilt original design.

OR-004 / CUT AND MACHINING 1

Face view: length horizontal, width vertical. T = actual thickness. Square cuts unless stated.

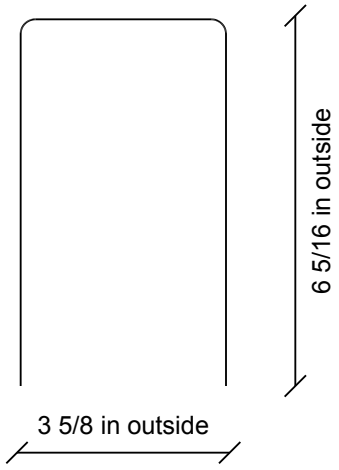


P01 Jig base / qty 1

10 x 8 x 3/4 in / 254.0 x 203.2 x 19.0 mm

Drill two 9/32 in holes at face (3 1/4,4),(6 1/4,4) in.

FINISHED PIN / CENTERLINE PROFILE



Wire diameter 1/8 in (3.2 mm).

Centerline top straight 3 in (76.2 mm).

Centerline bend radius 1/4 in (6.4 mm).

Nominal straight legs 6 in (152.4 mm).

Cut 15 13/16 in (401.6 mm); trim equally.

Finished profile tolerance 1/16 in (1.6 mm).

Round both cut ends; retain clearance above bark.

Dimensions in inches control; metric equivalents are in the cut list. Hole locations are measured from the stated face corner.