

Twist Jaw Tongs



Twist tongs look simple, but there are some crucial tricks to making them successfully. Make them wrong, and the jaws are likely to drop off!

Both parts of the tongs are identical, through at least the fifth step below.

First step: Mark and notch the bars



Take two flat bars, 3/8" x 7/8" x 11". Do these steps identically for both bars:

Using a center punch, put a mark near the edge 2" from one end, and near the opposite edge 3.5" from the same end. Do the same on both bars. These punch marks will be relatively easy to see on a red-hot bar.

Locations of punch marks



Using the rounded edge of your anvil, forge a rounded notch in from the side of the bar at the first mark. Go about halfway through the bar.

First notch



Using the rounded far edge of your anvil, forge a rounded notch in from the side of the bar at the second mark. Go a little less than halfway through the bar.

Second notch

On the face of your anvil, take out any nonuniformities in the thickness of the bar.

At the end of this first step, the front notch should be shaped as shown, with a shallower slope on the side nearest the end of the bar. The shallower slope will spread out the twist in Step 3.

Second step: Round the edges

This second step is crucial. If it's not done right, the jaws of the tongs can easily develop cold shuts and break off.

Using the rounded edge of your anvil, round of the inside edges of the notch closest to the end of the bar. Heat the bar in the vicinity of the notch to yellow heat. Hold the bar tilted sideways at 45 degrees and hit it with your hammer as shown to flatten the inside corners of the notch. Then rock the bar side to side, tapping with your hammer, to develop a smooth, rounded surface on the inside of the notch.



Front notch with rounded edges

At the end of this second step, the inside of the notch and the edges on the other side of the bar opposite the notch should be smooth and rounded with no grooves and no folds. The rounded portion should extend partway up the shallow slope of the notch (the side closest to the end of the bar). If there are any sharp corners or any folds, in the fifth step you will develop cold shuts that will cause the jaws to break eventually.

If there are still rough areas in the notch, pause at this point and use a round file to remove the irregularities.

Third Step: Draw out the reins



Reins drawn out, wider & flatter near the ends

Draw out the reins, using the edge of your anvil and the horn. Use the face only to straighten unwanted bends and to flatten faces of the reins. The reins should taper, being larger near the joint and smaller near the ends.

One nice trick is to flatten the last six or eight inches of the reins to give them a wider surface to grip with your hand. Chamfer the edges so they feel and look good.

Fourth Step: Punch rivet holes



Punch holes for a rivet at the hinge. Heat the hinge area to yellow. Drive your punch down with a heavy hammer, until you can feel the punch bottom out. Quench your punch after every two blows. If you let the punch get overheated, it will mushroom.

Punching the rivet hole



Turn the half tong over to see the "eye" on the back. Center your punch on the eye, give it a couple of good whacks, then move to your anvil's pritchel hole and drive the punch farther, knocking out the "biscuit" (the slug). Remove and quench your punch.

The "eye"

Using a conical drift (your tapered punch will serve the purpose) and orange-yellow heat, enlarge the holes until a rivet fits through easily. Flatten the hinge faces against the face of the anvil. After flattening, check to make sure the rivet still fits easily through the hole.

Fifth Step: Twist the jaws in two stages

This is the make-or-break step. If the notches have been made as shown in Step 1 and rounded as shown in Step 2, *AND* if you use a **yellow** heat, it should work fine.

Set the jaws of your vise slightly wider than the thickness of the half-tong hinge. Get a twisting wrench ready, with its jaws set slightly wider than the thickness of the half-tong jaw.



Correct position of the half-tong in the vise

Heat the jaw and hinge portions of your half-tong to a yellow heat. Place the half-tong in your vise so that the vise jaws close just behind the bottom of the notch as shown.

Vise jaws pull heat out of your half-tong quickly. That actually is a big help, because it cools the throat of the notch first, relative to the slope from the throat to the chin. Allow the bottom of the notch cool to a dark red. The mass of the tong jaw will keep the slope hot. This will cause the twist to spread out farther along the slope, rather than be concentrated at the throat.

Close your twisting wrench at the "chin" of the jaw, and twist clockwise until the jaw is at 45 degrees to the hinge. Re-heat to yellow, put the half-tong back in the vise, and finish the twist to 90 degrees. If you twist one tong jaw clockwise and the other counter-clockwise, I guarantee that they will **not** fit together!



45 degree twist



90 degree twist

If you have done everything right up to this point, the twist should begin at the throat of the notch, and continue partway up the shallow slope of the notch. There should be no cracks or folds.

If the notch was too narrow, or if your twisting wrench was too close to the throat of the notch, or if your heat was too low or was concentrated near the throat of the notch, the twist will be concentrated at the throat of the notch and it will almost certainly cause cold shuts.

Eighth Step: Rivet

It's worthwhile to make or buy a decent bucking block. That's simply a piece of 3/4" thick steel with spherical dents in it, made to fit the rounded heads of rivets. You can make one by first making round-end punches the right size for your rivets, then driving the punches into a chunk of orange-hot 3/4" steel.

Position the jaws correctly on each other and make sure the rivet fits through the holes in the hinge. Heat the rivet to a bright red, insert through the holes, make sure the two sides of the hinge are in close contact, put the rounded head of the rivet in a bucking block, and give the rivet a good, solid WHACK to upset it tightly in the hole. Peen the rivet.



Peened rivet

*Bucking block, tongs with unpeened rivet,
and flat stock for fitting the jaws*

At this point, the hinge will be frozen because the rivet has been upset in its hole. Don't worry, all will be well! Place your tongs back in the forge and heat the jaws and hinge to a bright red. Quickly cool the reins in your slack tub, then grasp the handles and plunge the jaws & hinge into the slack tub while rapidly opening and closing the reins. Open and close through the full range of motion while the jaws and hinge are cooling. Like magic, the hinge will loosen to just the right amount.

Ninth Step: Finish the jaws



Now you need to adjust the spacing of the jaws so that they fit the size of stock you want them to hold.

Open the jaws of your vise. Get a piece of the stock and set it on your anvil so you can easily grasp it with the tongs you are making.

Heat the jaws to orange, concentrating the heat on the jaws and minimizing heat to the hinge by just placing the jaws in your forge. Grasp the stock all the way back to the "chin" of the jaws. Move the tongs, with the stock in the jaws, to the vise and close the vise tightly. Keep the reins set wide at about 30 degrees.

Jaws closed on stock

Now is a good time to apply your touchmark on the reins.



Touchmark applied to reins

Tenth Step: Finish the reins

There are two parts to finishing the reins. First is to close them so that their ends are just a few inches apart while gripping the stock. Second is to "jog" them so that they move in the center plane of the hinge. Both parts can be done in a single step.

One thing to keep in mind while finishing the reins is that it is convenient to have a gap between the reins when the tongs are closed. This allows them to hang on a bar, without the bar forcing

the tongs open. By keeping the portion of the reins cool close to the hinge during the finishing operation, you ensure that the reins bend a few inches away from the hinge, leaving the desired gap.

Heat the reins of the tongs. Concentrate the heat away from the hinge and away from the ends of the reins. Cool the handles in your slack tub. Grasp the stock in the jaws of the tongs, and clamp the tong jaws in your vise. Bend the reins toward each other until the handles are about two and a half inches apart. Also, jog the reins toward the center plane of the hinge as shown.

Remove the tongs and quench in the slack tub. They are finished!



Steve McGrew
Incandescent Ironworks, Ltd.
www.incandescent-iron.com