The Dragon

This small, economical stove can make an incredible difference in comfort for those forced to live outdoors. On a frosty morning it can be a challenge to get a small fire going, and where concealment is important, the tell-tail smoke makes the smallest of campfires impractical.

This stove can begin producing comfortable heat within a couple of minutes, and with a little practice, can be started with about as much smoke as would be required to light a pipe. Once begun, you can feed it just about anything. Twigs and small hunks of wood and even limited quantities of leaves and paper that are unsuitable for even a camp fire can be converted into comforting smoke-free heat.

Its simplicity belies the thought and science involved in the design. By burning the smoke you render 40% more energy, remain concealed, and reduce pollution. This requires a hot fire and a good blast of air, but this normally translates into a fire that is at first too hot, and then quickly burns out.

By having the air inlet directly opposite the flue outlet, the fire is exposed to a direct constant blast of air – ideal conditions for burning the smoke. By standing the wood on end in the main pipe, there is not enough air above this fire to burn it all at once. As the bottom of the charge burns, the rest of it gradually settles into the fire to provide an extended high-intensity burn. With a little practice this diminutive stove provides the best combination possible for a small concealed camping situation.

The name for this stove (“the dragon”) was given by a group of homeless people who were among the first to enjoy its comfort. This fits with the soft low roar that the stove makes when functioning efficiently.

The stove is constructed from a 5” piece of sheet metal pipe, a 3” Ell, and the piece of flat sheet metal shown on the left.

Three types of tin snips can come in handy: The gray pair is for cutting straight lines, the red pair for cutting counter-clockwise, and the green pair is for cutting clockwise. Either the red or green pair would be enough, but when you work with sheet metal you soon realize why the other two were invented. The pointed tool to the left of the gray tin snips is a scribe, the traditional marking tool for sheet metal work (a large nail works almost as well). For my part, I find a felt-tipped pen such as show to the right of the pliers to be handy as well. Then of course, there is the metal yardstick. Missing from this photo is the hammer, an electric drill with a 1/8” bit, and a pop rivet gun.

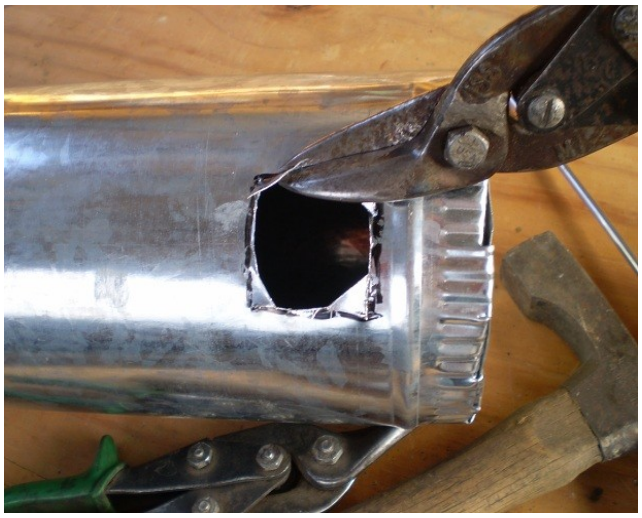
Begin by standing the crimped end of the 5” pipe on a flat piece of sheet metal, and marking the sheet metal with it's outline. This circle must be cut out about 1/8” inside the line, and will form the bottom of the stove. Draw a line around the pipe, about 1/2” in from the crimped end.

Beginning from a position right next to the seam in the pipe, cut an *even number* of slits about 1/2” apart around the bottom of the pipe, and bend every other tab inward. Set the sheet metal disk on the bent tabs and fold the remaining tabs over it to secure it in place. Tap these tabs lightly with the hammer to tighten the seal on the bottom of the pipe.

Center a 1-1/2” square 90 degrees from the seam, with its bottom 1-1/2” above the end of the pipe.

Drive the scribe deeply into this square and twist it sideways to create a starting point for the tin snips.

Begin cutting out the square with a spiral pattern, and finishing with tin snips that cut in the opposite direction (if you happen to have a pair on hand).



Hold the uncrimped end of the Ell against the opposite side of the pipe, with the crimped end pointing to the top of the pipe, and mark it to fit the pipe. Trim to shape and use it draw a circle on the pipe, with the bottom of the circle 1-1/2” above the bottom end of the pipe.

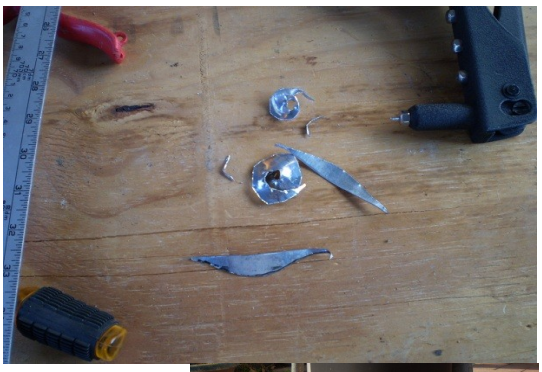
Cut a hole about 1” in diameter in the center of this circle, and cut about 8 radial lines outwards, that are just long enough to cross the line of the circle.

Bend the resulting tabs outwards so that the fitted end of the Ell can slip in between them.

When you insert the Ell, make sure that none of it protrudes into the pipe, or else the descending wood will hang up on it.

Secure the Ell in position with pop rivets or sheet metal screws; not every tab must be secured. I like to put at least two rivets near the top of the Ell as shown on the left below, and another couple in the sides near the bottom. One of these is visible in the photo on the right below.

If you do not find and keep track of every single scrap of sheet metal – especially the tiny ones – they are likely to find you. They are particularly fond of bare feet and unsuspecting hands and forearms. Perversely, they seem to especially love children. Please take this warning seriously.



About 7' of 3” flue pipe provide enough draft for efficient operation.

Painting the stove with a high-temperature flat black paint improves the radiation of heat.

When igniting the charge of kindling at the bottom, it helps to blow a little of the fire into the bottom of the flue to get the draft started.

Since the lid is not airtight, DO NOT USE THIS STOVE INDOORS.

Sometimes you may wish to regulate the air inlet. A piece of sheet metal formed as shown here works pretty well. This is also convenient for covering the inlet when the lid is to be removed for adding wood. This will draw the draft down the pipe instead of allowing the smoke to rise through it.

It is convenient to attach a 2' length of pipe directly to the stove by adding a scrap of sheet metal between this piece and the top of the stove as shown below. This way a single 5' section of 3” flue pipe is all that is needed to extend the stack to the minimum height required.