

the FireLight Stove [\(click here to download this page as a PDF\)](#)

LEGAL: This is my design. You may make one or two for personal use or for a friend. **You may NOT SELL ANY stoves made by this design!** If someone wants to buy one, contact me, rjprince@FireLightStove.com **The USER assumes ALL RISK** for making and using this stove. It will work well if made according to these instructions. This stove is intended to be **made and used ONLY BY ADULTS and/or with RESPONSIBLE ADULT SUPERVISION. DO NOT USE THIS STOVE INDOORS OR IN A TENT! Do not use this stove on flammable surfaces, or in close proximity with flammable objects. ONLY USE THIS STOVE ON A STABLE AND NON-FLAMABLE SURFACE. IF YOU KNOCK THE STOVE OVER WHILE IT IS IN OPERATION, BURNING ALCOHOL WILL SPILL OUT AND THE FIRE WILL BE OUT OF THE BURNER AND ONTO WHATEVER SURFACE THE STOVE WAS AT THE TIME.** Again, **THE USER ASSUMES ALL RESPONSIBILITY AND LIABILITY FOR THE SAFE BUILD AND USE OF THIS STOVE. Ray Prince and FireLightStove.com will not accept any liability for any event that may occur due to the use or misuse of this stove. If you do not agree to these terms and conditions, do not make or use this stove!**

PLEASE NOTE: Knives and sharp edges can cut! Scissors can pinch and cut! And of course the main value of fire is that it gives off heat or in other words, **FIRE BURNS THINGS!** If you are not responsible and coordinated enough to use tools and fire without hurting yourself or someone else, you should probably buy a stove, not make your own! If you cut yourself on the edge of a can or burn yourself with alcohol; or if you burn the kitchen counter top or set the house on fire; or cause any other type of property or personal injury --- you have done so against my specific warning to the contrary and I will not accept liability for your ineptitude. If you are competent with a craft knife and flammable substances, please do not be offended by my warning to those who are not.

Home-made alcohol stoves are inherently lighter and less likely to fail than my other store-bought stoves. If you are dedicated to solid fuel tablets, just turn the burner over and place the tablet on the top (formerly the bottom) and light it!

I do not recommend anything but denatured alcohol and HEET (methyl alcohol in YELLOW bottle) in these burners. I am confident that grain alcohol will work as well, though I have not tried it. **DO NOT USE GASOLINE, DIESEL, KEROSENE, LANTERN FUEL, NAPHTHA, JET FUEL, ROCKET FUEL** or anything but denatured, ethyl, or grain alcohol in this burner! Isopropyl may work in a pinch but it does not burn as cleanly or put off as many BTUs. If you do try Isopropyl alcohol, the 91% works better than the 70%. Isopropyl does give a nice yellow/orange flame that is much easier to see than the more intense blue flame produced by methanol/ethanol. In the process of developing this stove, I have made literally hundreds of burners of different designs and with many modifications. During development and testing I burned over 7 GALLONS of denatured alcohol, 1/2 ounce at a time, sometimes with as many as 10 stoves burning at the same time! I built most of the other soda can stoves as well as numerous variations of the cat food/tuna can stove and even came up with some ideas using round Altoid lemon sours cans.

I believe that this design has several advantages over some of the other soda can stove designs:

- quick to build from readily available materials
- simple construction of both burner and screen
- no special tools, materials, glues, etc. needed
- overall weight is a bit less than some of the others
- burns well in sub-freezing conditions (not sure about sub zero weather)
- ease of operation (fairly low "fiddle factor")
- compact/self contained - everything fits inside pot with room to spare

Again, if you have any doubt about being able to complete this project safely, please BUY A STOVE! On the

other hand, if after a few tries, you are still unable to complete a project of this nature, you probably should not go hiking alone or be trusted with matches!

MAKING THE BURNER:

Burner Materials List - ONE soda can (that's it!)

Tools - break away razor knife; scissors; block of wood, book or CD cases (1 1/4 inches tall for scoring the top, then about 1 inch for scoring the bottom of the can). I have made a burner using only my leatherman micro, but cutting the slits in the top 1/3 of the can dulled the scissors.

Time to build - 5 minutes or less (after the first one). I can make a burner in less than 2!

Lay a blade (with fresh tip) on the book (I use a block of wood) with the point protruding about 1/3 to 1/2 inch.

Remove the flip tab from the top of the can (otherwise it can get in the way). Position the can, top side down. Rotate the can using the book (block) as a guide so that the blade scores the can. I usually spin the can around at least twice. Rotate back and forth over about a 1/2 inch section to cut completely through the can at one point.

Turn the can over and score the bottom portion of the can about 1 inch from the bottom. Separate both the top and bottom of the can from the middle section which is not used at all. Invert the top of the can so that the lid is against your work table. Use the utility knife to score around the inside top of the can. Rotate several times to make it easier to remove the lid. Use the scissors to "punch" the lid away from the rest of the can (see photo).

Cut slits in the top portion of the can up to the point where the can begins to taper into the lid. I usually cut just to, or slightly past the taper. Cut the slits about 1/3 to 1/2 inch apart. I have cut them 1/4 inch apart, but it does not make much difference in the performance of the burner.

Insert the top (now slitted, somewhat like a fan blade) into the bottom and press until it seats all the way down into the bottom portion. While maintaining pressure to keep the top inside the bottom, use thumb and forefinger to pinch the upper rim of the bottom at opposing sides 8 times. This crimps the bottom portion and holds the two sections together.

This completes the burner portion.





WINDSCREEN/POT STAND

Materials list - aluminum roof flashing (mill finish, not coated)

Tools - metal straight edge, utility knife and paper hole punch

Time to build - 5 minutes or less, after the first one.

Using the strait edge, score the aluminum flashing to make your cuts. If you bend the flashing at the score, it will break apart cleanly. You may want to make a few practice scores and breaks to get the hang of it.

Cut a strip of aluminum three inches wide and about 20 inches long. Wrap this around the outside of your cook pot and mark about 1 and 3/4 inches beyond where the end overlaps. This will give you a windscreen/pot stand that is custom cut for your pot. I use a Titanium Tea Kettle and my aluminum strip is 3 x 17 before I fold the end tabs over. I use a special tool, but you can fold the flaps any way that works. I used to use the metal strait edge to fold the end tabs. Fold each end tab in the opposite direction so that the aluminum looks like a very tall skinny "Z", otherwise the ends will not interlock. I "mash" the fold flatter at the middle of the "tabs" to form a tighter connection.

Punch 20-25 holes about 1/2 inch from the bottom edge of the windscreen. Punch 4-6 holes about 1/3 inch from the top edge of the windscreen. Interlock the end tabs to form the wind screen into a short cylinder. Put tent stakes through the top holes to make a "rack" for your cook pot.

This completes the windscreen/pot stand portion! You are DONE! Now to start cooking...



USE METAL TENT STAKES TO SUPPORT YOUR COOKPOT. Plastic tent stakes will not work well for obvious reasons. (If these reasons are not obvious to you, please accept my **STRONG** warning that this stove is not for you!) Slide them through the holes at the top of the windscreen/support in a manner that will provide stable support to the cookpot. I only use one support for my Titanium Teakettle as the open handles provide enough support at the rear of the cookpot.

When you light the burner, the alcohol will burn on the inside of the burner until the sides are hot enough to boil the alcohol between the insert section and the outer wall. This space between the cans acts as the "generator". It takes only about 5-10 seconds for the generator to heat up, then the burner will generate flame along the top outside edges. This way to accomplish a "pre-heat" is simpler some of the other methods. Granted, the flame does not shoot out of nice "jets", but it seems to be just as effective. This design burns hotter than a simple open can design.

Remember your stove does not have to be pretty, it only has to work well and this stove works very well.

This stove has two effective heat settings - ON and OFF! I experimented with several "simmer" devices but was not really satisfied with any of them. You can invert the burner and add a small alcohol to the "bowl" that is now on the top. This will give a medium level of heat, compared to operation in the normal position. (You could also use a solid fuel tablet in this position, but why?). One further idea on the "inverted burner" position -- you can add a little water to the alcohol and get a lower burn temperature. After the flame goes out, you will still have some water left, but this method will provide a "simmer" of sorts.

Assemble the wind screen/pot stand. Put water in the pot, put lid on pot. Add about 1/2 to 2/3 ounce of denatured alcohol to the burner (just enough to cover the dome). Light the burner. Place the screen/stand over/around the burner. Put the pot on the screen/stand. 1/2 ounce of alcohol will boil 16 ounces of water in about 5 minutes in my Titanium Tea Kettle (by MSR). If you boil more water, you will need to use more alcohol. But again, if you needed me to tell you that, you should not go into the woods without experienced and well trained supervision! Experiment to find what works best for you. 32 ounces of water takes about 1 ounce and about 12 minutes to come to a boil.

NOTE: If you are using the stove in very cold weather, keep a small bottle of alcohol in an inside pocket to keep the alcohol warm. I experimented by freezing the burner, setting it in a plate (and bowl) of ice and ice water, adding warm alcohol and then lighting it. It did not burn quite as strong under those conditions, but it did preheat and burn well, melting the ice that was against the burner rather quickly. Try it! Some of the other homemade stoves go out if you set it in ice water or on snow. This one does not!

Please drop me a note to let me know how it works for you! I may post your comments on my webpage!
rjprince@FireLightStove.com