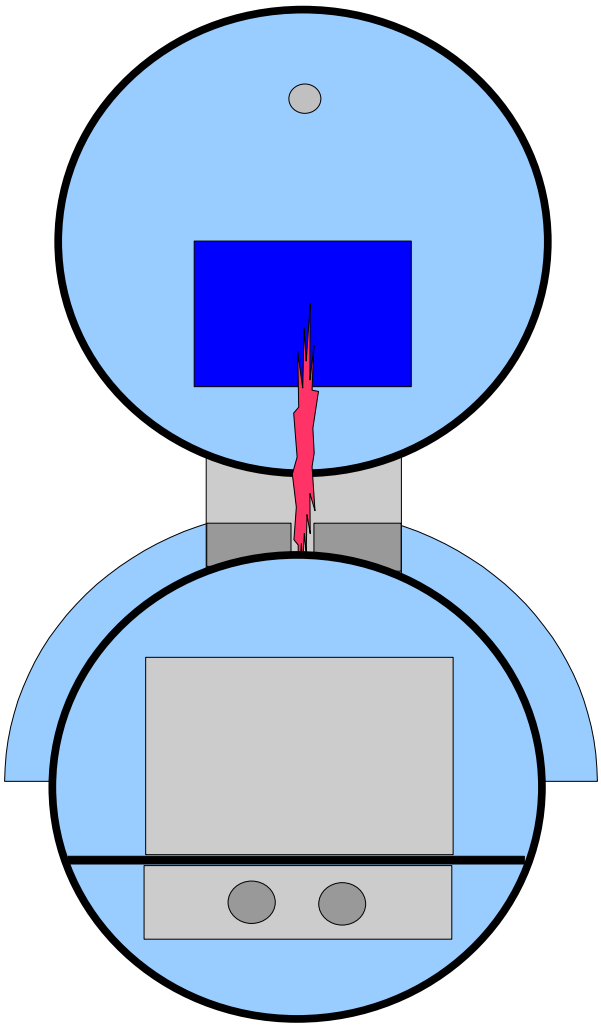
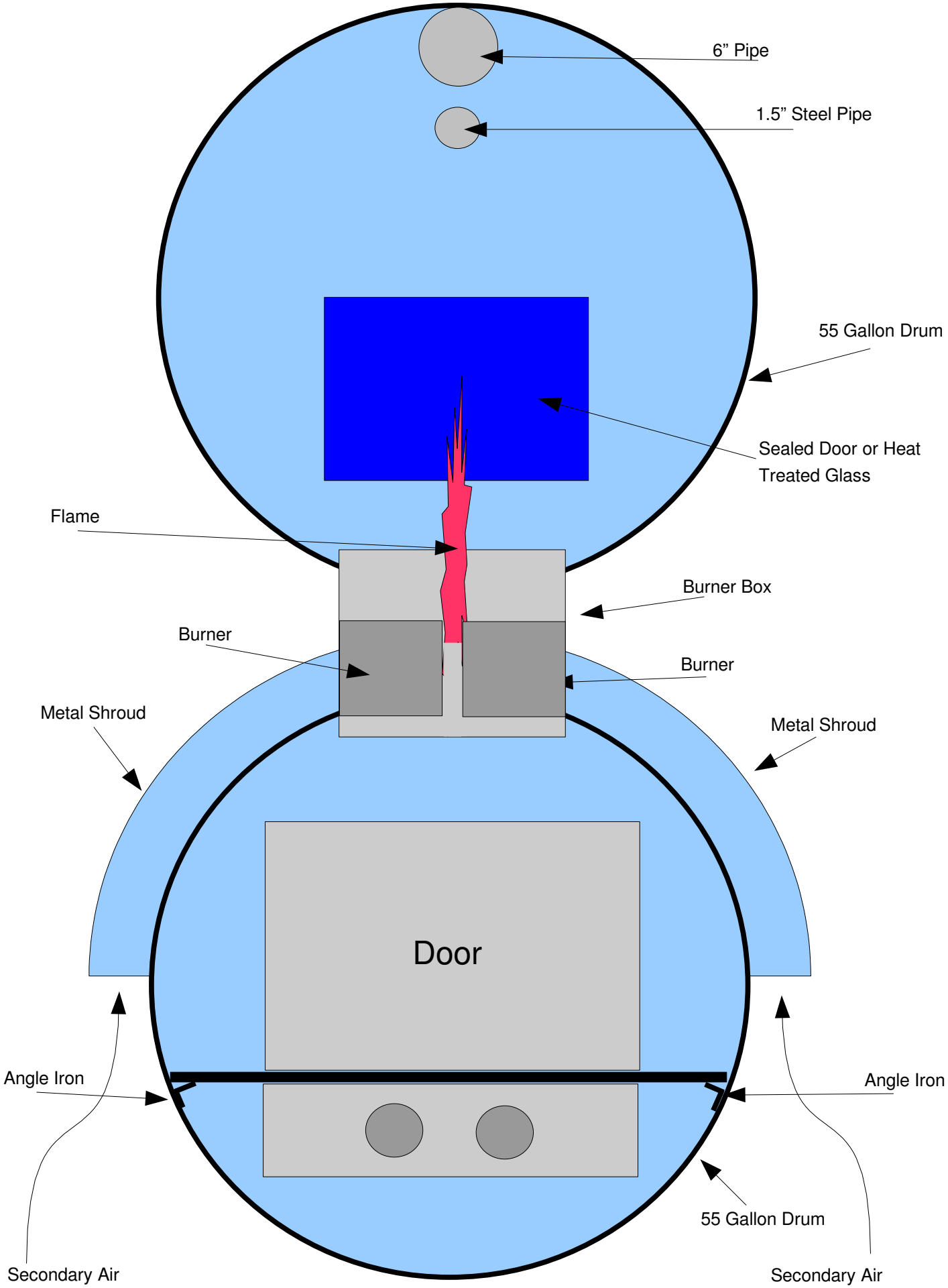
Two Barrel
Wood Gasification Stove



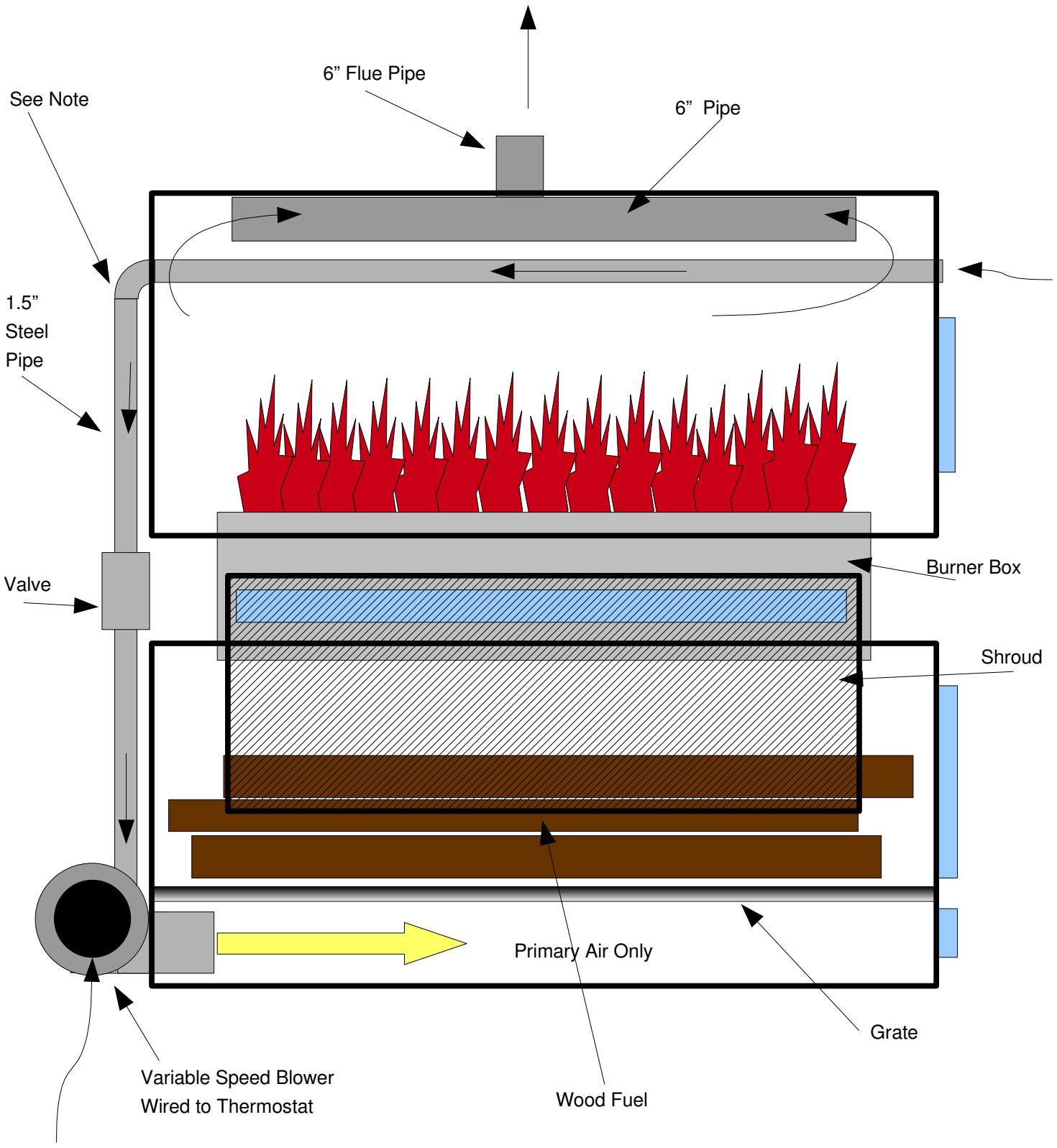
Original Version

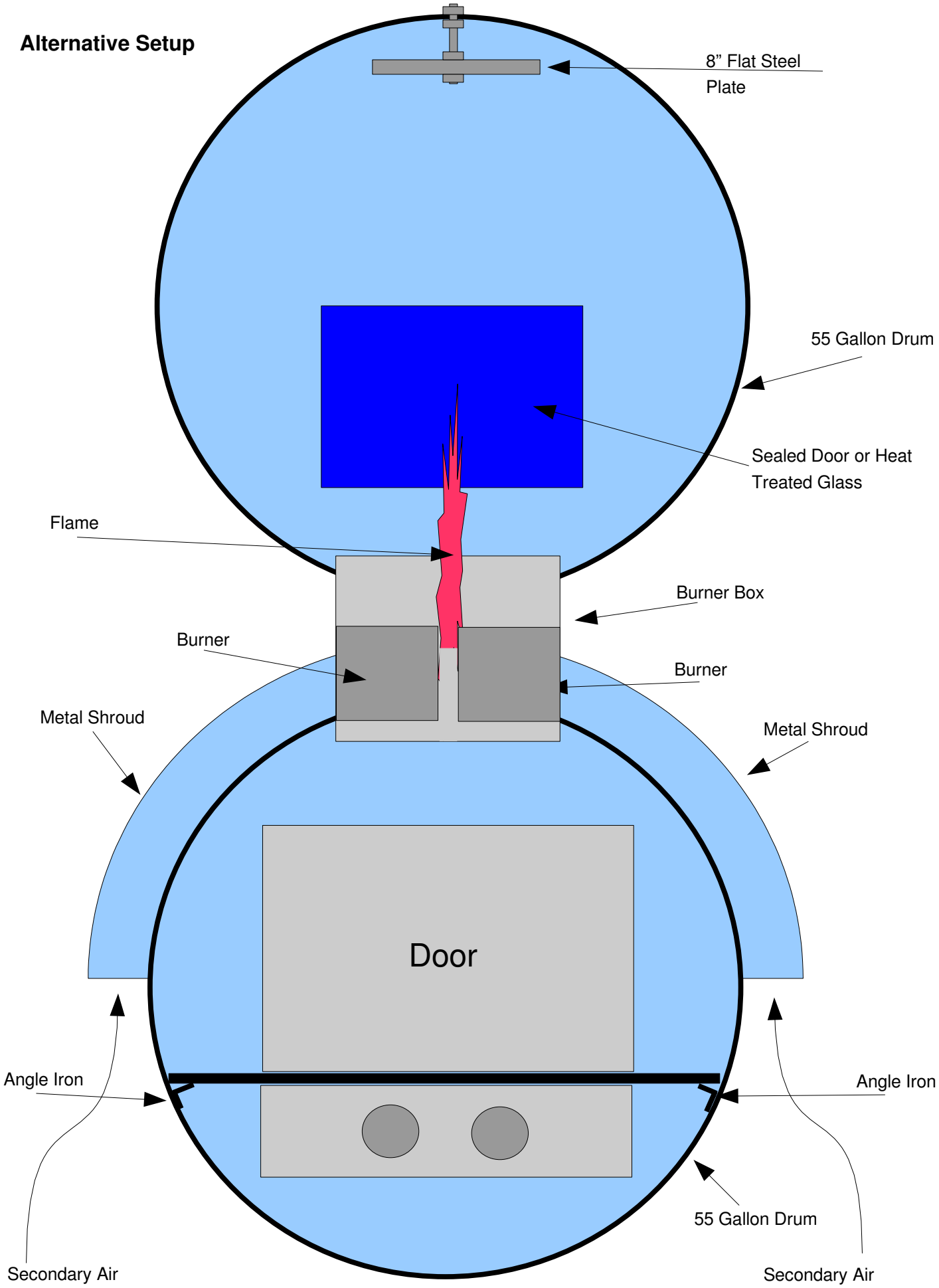
Kit

This is the same way I am using this stove except for the modifications as shown in the drawings below. You will not be connecting the round pipe between the barrels and the top barrel flue will be in the center. However this picture shows that this drum has no top lid. I used the door on the right as it is air tight and has the round primary air intakes that can be shut off.

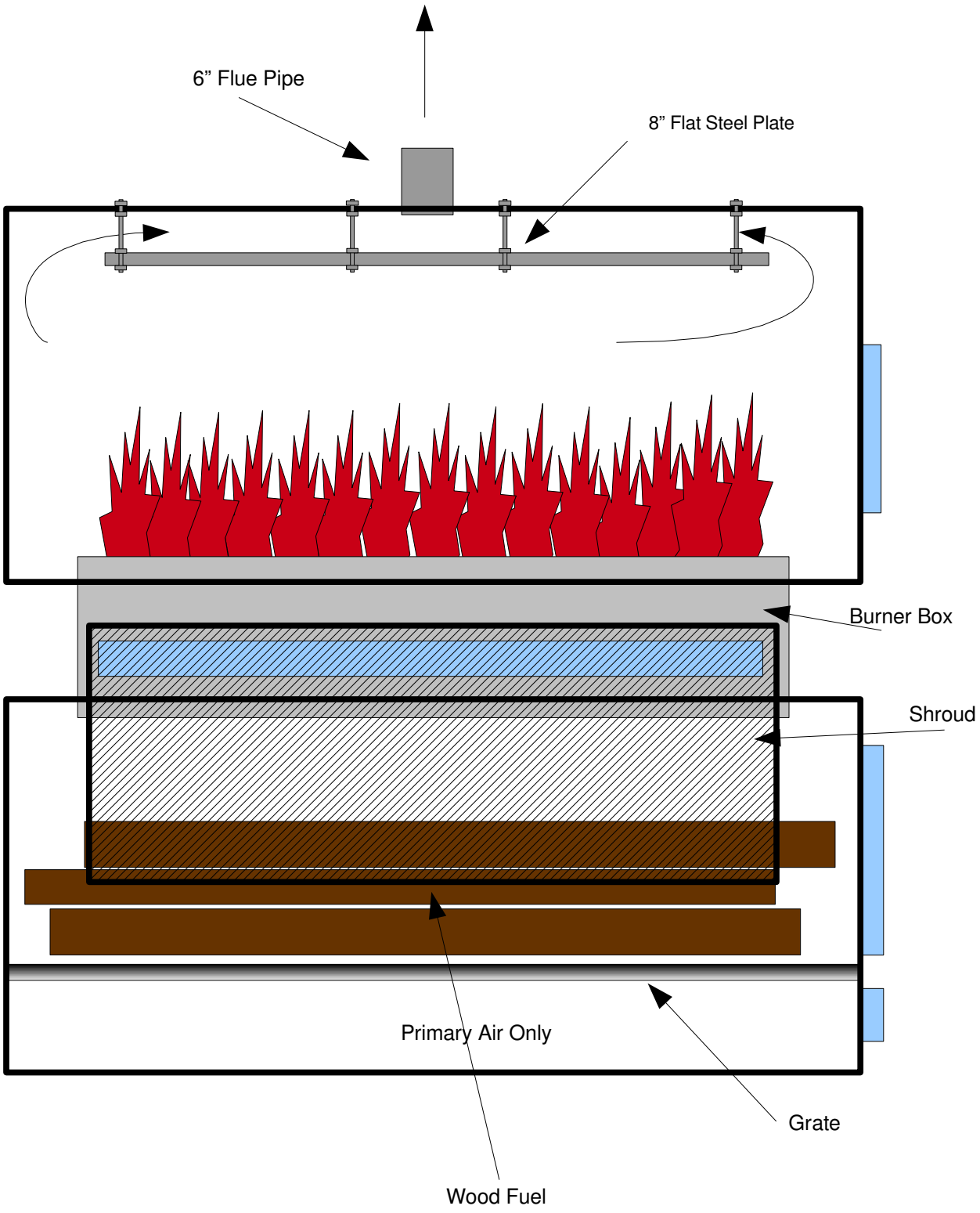

6” Pipe
1.5” Steel Pipe
55 Gallon Drum
Sealed Door or Heat Treated Glass
Flame
Burner Box
Burner
Burner
Metal Shroud
Metal Shroud
Door
Angle Iron
Angle Iron
55 Gallon Drum
Secondary Air
Secondary Air

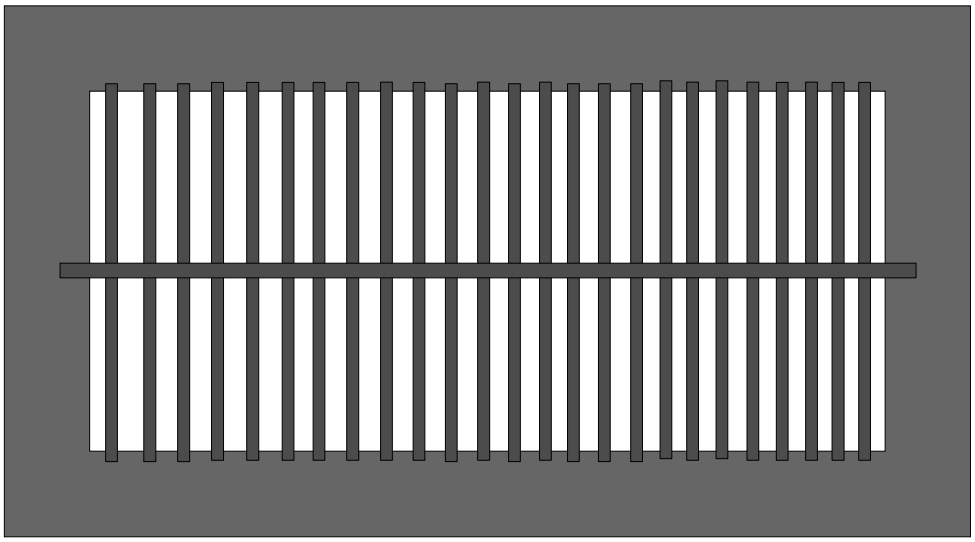
Note: This 1.5” Pipe is used to compensate for extreme outside cold temperatures. If using outside primary air, a portion of inside air is heated to be used with primary air. Other wise the pipe is not needed.



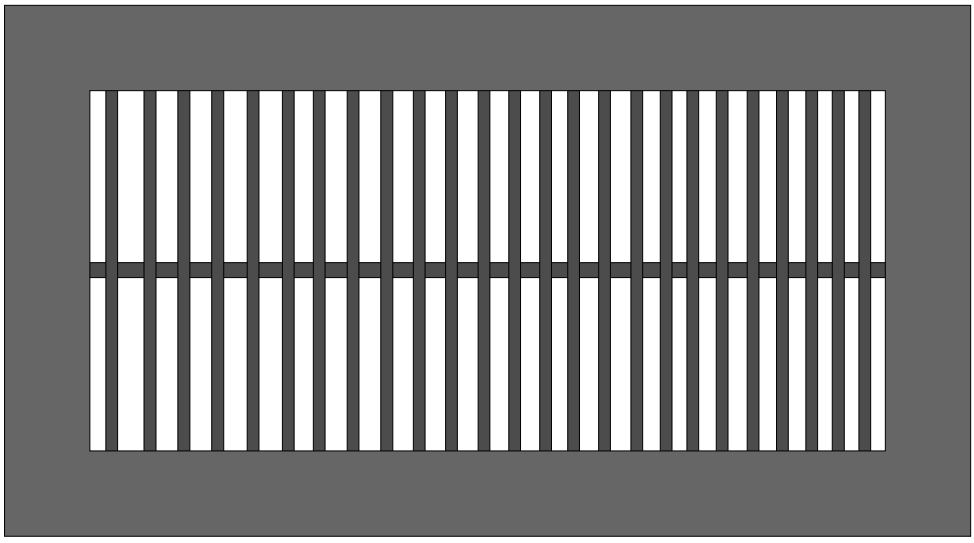

Alternative Setup
8” Flat Steel Plate
55 Gallon Drum
Sealed Door or Heat Treated Glass
Flame
Burner Box
Burner
Burner
Metal Shroud
Metal Shroud
Door
Angle Iron
Angle Iron
55 Gallon Drum
Secondary Air
Secondary Air

Alternative Setup

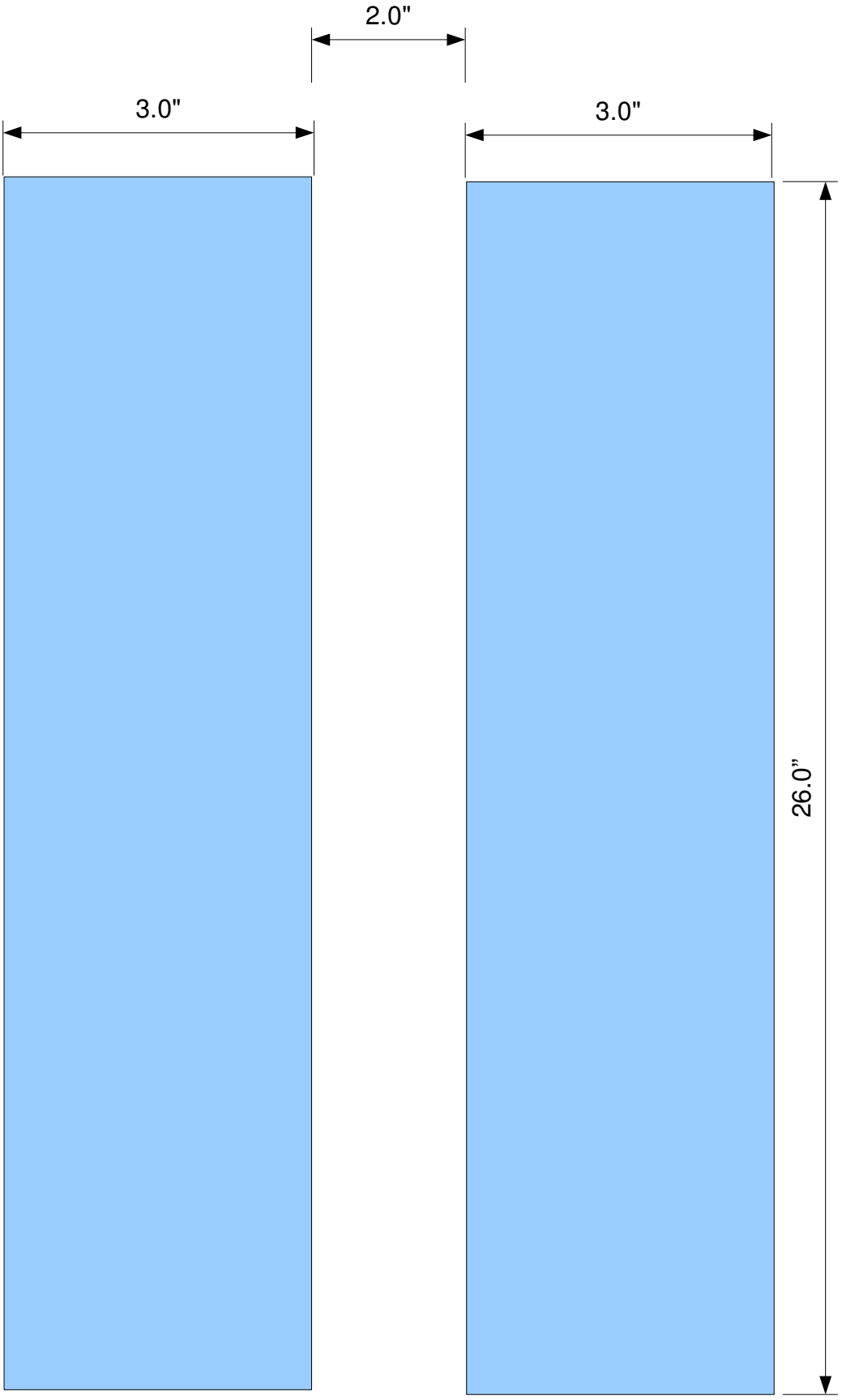




Grate
Bottom

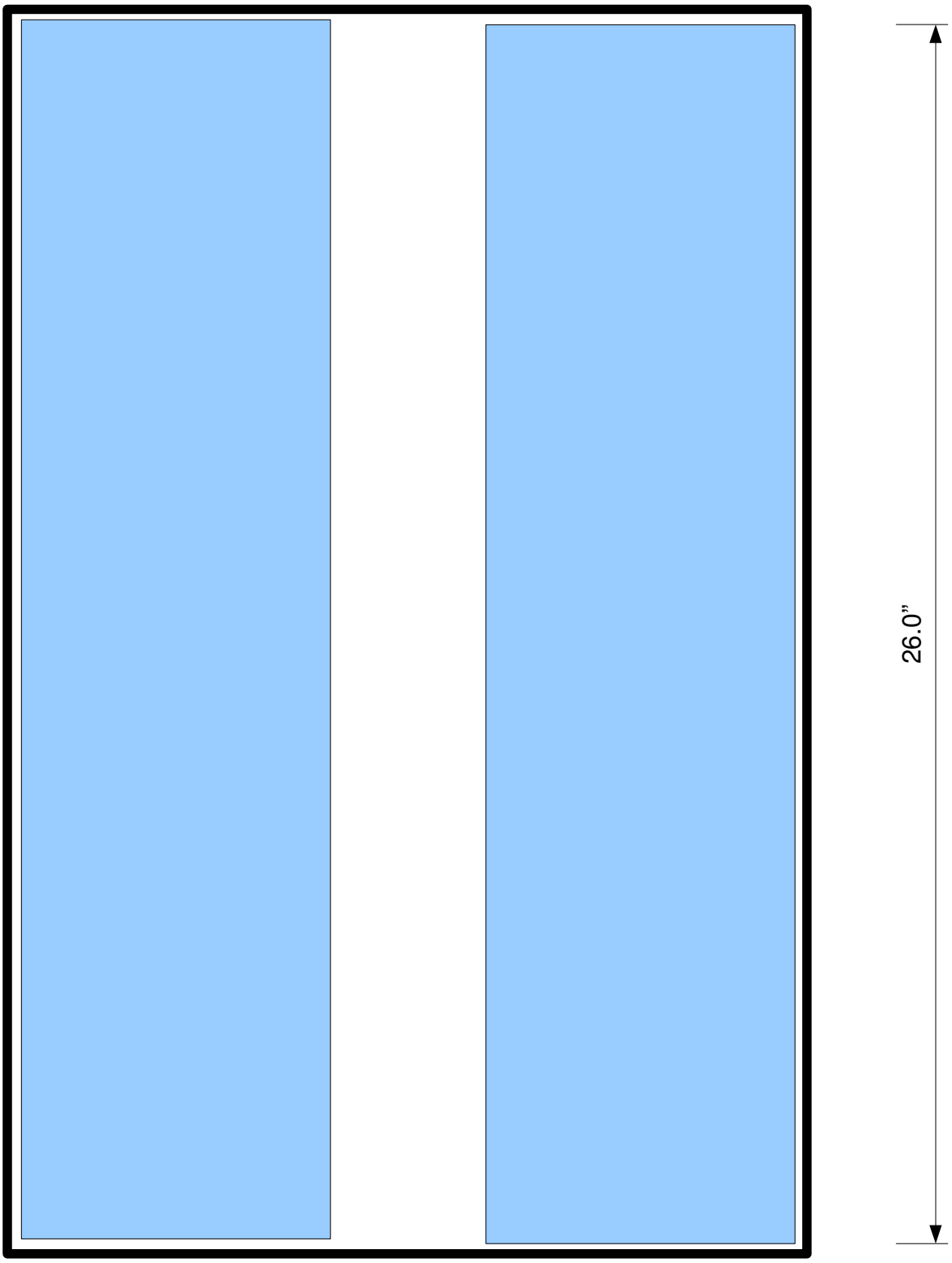


Grate
Top



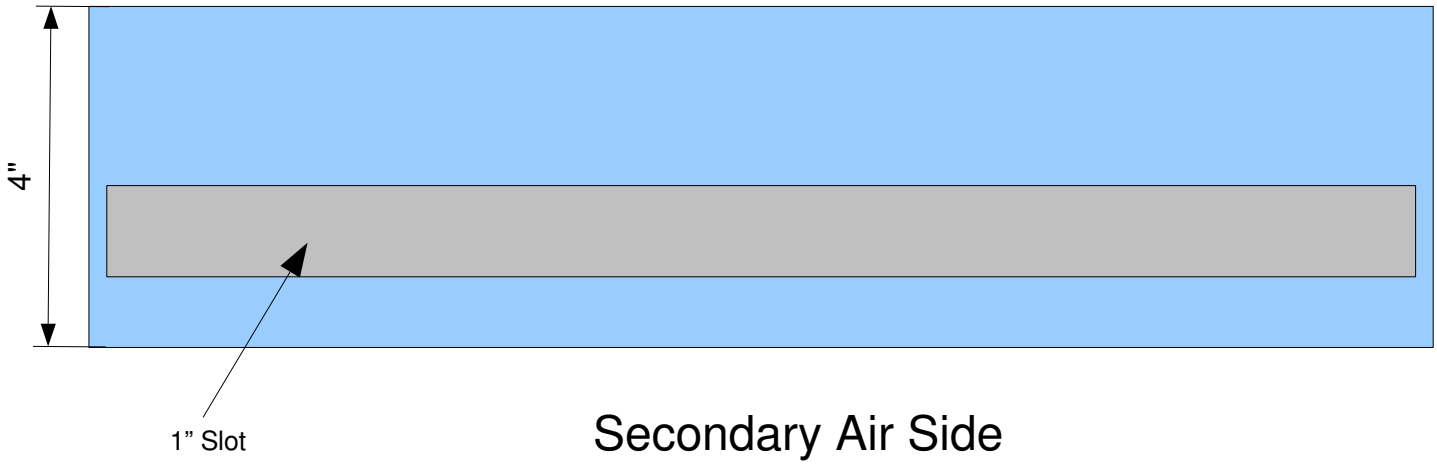
Burner Secondary Air Supply

Note: Metal Box is welded into both top and bottom drums. 2 Burner boxes are then welded into the main box. This is the Top View of the Main box and Burner Boxes.



Burner Secondary Air Supply
With Box surround

Burner side



Secondary Air Side

2 each of these

Instructions

The Barrel Stove is designed from the original Vogelzang stove. The kit was used on the stove as originally planed but the pipe to connect the stove was not used. The originally stove also did not
have a grate and used only the front primary air slots.

The Burner Box that goes between the barrels is 9” wide by 28” long. This can be shorter but make it between the legs of the top barrel. The Barrels I use, the lid comes off so that you can make the grate and insert it before welding it shut. You can use a stove gasket and use some sort of straps to keep the lid on tight all the way around the barrel.

First I mount the legs to the barrel half way between the first and last ring on the barrel. Do this on an even floor so the legs will be flat to the floor.

Next I take the lid and cut the hole for the Door and secure it to the barrel for a true fit, Then remove it.

Next I build the grate to fit inside the barrel above the 2 primary holes in the front door. Under the grate and fastened to the barrel, I mount to angle iron pieces to hold the grate level. Use bolts to secure it to the drum and that it it level.

Next build the Burner Box and make sure it is square. You will have to measure the distance from the bottom barrel top, to the top barrel bottom and then add the extra distance needed to be inside both barrels by at least an inch. Lay the Burner Box on the top of the Bottom barrel and draw a line along the outer edge of the box. This will give you a pattern of where to cut the square hole in the barrel. Make the cut hole a tight fit as you will have to weld up the hole later so there will be no air leaks.
Once you have cut out the top of the bottom barrel and you have a good fit, you can then use it to cut out the hole for the top barrel.
Now make two more box's burner boxes that will tight fit inside that Burner box. Leave 2” between the two burners for the gas's to escape to the top barrel past the secondary air holes. See the diagram to cut the holes in the burner box's. The 3/16” hole's go to the inside of the stove and the large 1” hole goes to the outside of the stove. This is where room air enters under the metal shroud. Weld these into the Outer Burner box as shown.

Next Weld the Burner Box into the top of the bottom barrel, making sure that it is level and there are at least an inch below the barrel. You can just tack it in for now then weld it all later.

Next mount the top barrel stove legs to the bottom drum and then sit the top barrels down over the burner box that you cut for a dry fit. If everything came out, there should be at least an inch inside the top barrel also for the burner to stick through. Now you can mount the legs to the top barrel and tack weld the burner box to the top barrel.

At this point, you drill a hole into the center at the top of the Top Barrel to mount a 6” Flue pipe.
From this point, after you put the lids on both barrels that will not leak, you can use the stove this way and use the front primary air controls for the stove. I do use use any dampers in the stove. if you got the plate with the damper, then keep it wide open at all time. Use the primary air control to control the flame.

The next problem is to make the shrouds for the secondary air chambers. this is made from tin duct and formed over the barrel as shown. This way air will travel up the side of the barrel and into the 1” slot that is in the side of the burner box and then into the burner. Heat from the barrel will pre-heat the air before going to the burner.

The Blower and extra pipe has not been tested and will be tested this winter. The purpose of the 6” pipe at the top of the top barrel is to re-burn any gases that may escape. It also allows any tar that may collect on the outside of the pipe to fall back into the burner to be burned. This should eliminate any smoking of the stove except when first lit. During the first 2 minutes or so, it will smoke then as the flame raises to the top barrel in the burner, the smoke should disappear.

If using outside air with or without the blower, the 1.5” pipe is to heat some of the air and add it to the primary air. It was found that during temperatures of -15 or below, the stoves will not function properly due to the outside air being cold. This pipe uses a portion of inside air and then brought back through the stove for re-heating and then added to the primary air. A valve is used to turn it on or off.

The Blower is a small blower that you can control the speed of. When the room temperature calls for heat, this blower turns on to provide a very small amount of air to the stove. On the end of the blower that goes into the stove, is a plate that opens up with air flow to allow the air into the stove. When the blower is not running, the plate falls down over the blower output to stop any air from getting to the stove. Idling air must be adjusted from the front primary air controls to keep the stove operating at the lowest point.

Depending on the out come this winter, 2007, and the shape of the barrels, I may have to change this design to an all steel unit. I know this stove will run hotter than the one last year due to the fact that it would not always gasify. I hope to add to this manual the pictures and running tests after this winter.

Update: In not finding any pipe that would reach a temperature of 2100 degrees that did not cost an arm and a leg, I have provided 2 Alternatives to the top Barrel. The flat plate steel is to stop the flames before hitting the top of the barrel so as not to get the barrel too hot. Any tar might collect on this steel but should burn before going up the flue. I have also removed the Blower from this method but you can add it if needed. This way you control the stove manual from the 2 primary air controls from the front.

Email: kensmith52@yahoo.com
Group: http://tech.groups.yahoo.com/group/WoodGas