# Starting and Maintaining a Hand-Fired Coal Stove

Starting and maintaining a hand-fired coal stove does not have to be difficult or messy, but it is different than burning wood. The most important difference to remember is that you will be adding and igniting fresh coal before you shake it down to remove the ash. So if you get nothing else from this guide, remember that fact. One of the great benefits of burning coal is, in most cases, you will be able to keep the fire burning all season with alot less work. Just maintain it a couple of times a day. Initial start-up will take between 30 and 60 minutes, depending on how familiar you are with starting a coal fire and your stove. Maintenance (shake down and top off) time is usually 5-15 minutes.

**Harman Magnafire Mark 2 Coal Stove**

## WHICH SIZE OF COAL TO USE?

The two most common sizes of coal used in hand-fired coal stoves are "pea" and "nut". Pea coal is about the size of a quarter while Nut coal ranges between the size of a golf ball and a tennis ball. When using pea coal the fire will burn slower and softer than with the nut coal because the air pockets between the pieces of coal are smaller. It is ok to mix the two sizes for a medium type of burn.

## AIR FLOW (INCOMING AIR)

Today's stoves are airtight so you have much greater control when it comes to how much air is permitted to enter the stove. Coal takes air from underneath, unlike wood that takes air from around and above it. So the more air flowing through the coal from below the hotter and faster the coal will burn. Keep this in mind as we take you through the steps to starting and maintaining your hand-fired coal stove.

Before and during the season, check your gaskets around the doors and glass on your unit for wear. If air is leaking into the stove through these areas the degree of control will be reduced. Here's a trick: take a business card (someones you don't really like anyway) and

attempt to slide it in between the stove and the gasketing on the doors. Go all the way around. If the card slides past the gasketing, there is leakage of excess air into the stove. The gasket should be replaced.

Also, when burning coal you should have a barometric damper installed in your stovepipe. A barometric damper controls the amount of heat and gases flowing up your chimney. Coal burns much hotter than wood, so it is important to have a damper that will open and close automatically to adjust the exhaust flow. When the barometric damper opens it will draw room air into the stovepipe to cool the air rising up the chimney and still allow more heat to stay in the stove. When the damper closes it will allow more heat up the chimney preventing the unit from overheating. Most barometric dampers come with installation instructions, read them carefully and most importantly make sure your damper is "plumb".

NOTE: In coal burning applications, you should always use a 24 guage or higher stovepipe exhausting into a masonry or Class A chimney system. The crimped end (male) of the pipe should always point down, inserting into the uncrimped (female) end. Fasten the pipe together with a least three self-drilling screws. This will prevent any loosening of the stovepipe due to vibrations that can be caused during severe weather and/or chimney fires. Because coal lets off carbon monoxide it is always better to be safe than sorry.

## LET'S GET YOU STARTED

You start a coal fire the same way you start a wood fire. An important note is to NEVER use pressure treated lumber in a wood fire. Pressure treated lumber contains arsenic, a highly toxic chemical. Adjust your air intake on the ash door fully open giveing the unit all the air it can take in. You could open the ash door during this time, however, DO NOT leave it. If you must leave the stove at this time, SHUT THE DOOR!

Crumple several pages of newspaper and place it on the grates covering the bottom. Lay your kindling on top of the newspaper and light. The quick flames produced by the newspaper will ignite the kindling and preheat the chimney causing the draft to "open". Draft is caused by hot air rising in the chimney while cooler air passes across the top of the chimney opening, creating a suction effect. Add a layer of seasoned hardwood on top of the kindling and allow it enough time to ignite to the point that you know it will burn for approximately 10 to 15 minutes. These pieces do not need to be thick, usually about 3 inches at the widest point is enough.

Once your fire is ignited and burning well, add a layer of coal, 2 to 3 inches thick on top of the firewood. Close door and allow enough time for the coal to ignite, approximately 5 minutes. You will know it has ignited when you can see an orange glow around the lower coals and you have "dancing" blue flames across the top of the coal bed. Add another layer of coal and wait again for the dancing blue flames. Then do it for a third time, if necessary. The idea is to have 4 to 6 inches of coal burning in order to have a well-

established bed of coal. IT IS EXTREMELY IMPORTANT to allow time for the "dancing" blue flames in each step. These blue flames are the gases burning. If you do not wait, the gases can build up and ignite suddenly causing a small burst. this has a potential to be harmful to your stove and possibly, though very rarely, can cause glass breakage in your stove, allowing carbon monoxide to escape.

Now you can top it off with more coal. You can pile the coal to just before the top of your firebricks and even higher in the center. If you have a top loading, hopper-fed hand-fired coal stove, fill the hopper slowly so that you do not smother the fire. Wait until you see the "dancing" blue flames again, then you can adjust the intake air to a more comfortable level. With round draft knobs, usually 1 - 2 turns is a good starting point. With lever action drafts usually one half open (50%) is sufficient. For automatic thermostats, just adjust it to the desired temperature. As the weather gets cooler or if it is not throwing off enough heat you can open more draft into the unit as needed. Remember, coal burns slowly, so any adjustment made in the intake airflow will take about 30-40 minutes before you feel the difference.

How often you "top off" and "shake down" a hand-fired coal stove in a day will depend largely on the make and model of your stove, the overall condition of the unit, how hard you burn it and the quality of the coal you are using. In most cases with today's stoves, you will only need to maintain it every 12 hours. After the first initial startup, you may want to do your first shakedown about an hour or two after startup to get rid of the wood ash that prevented a complete filling of the stove with coal. By the time you top off the stove with coal during the initial startup, the wood will not have completely burned away yet. When you shake down the wood ash, there will only be a small amount of ash at this point.

SPECIAL NOTE: Any home that has a coal stove should also have a carbon monoxide detector in the room where the unit is located. It is also wise to have one on the sleeping floor, so that even when asleep, you will have sufficient warning of carbon monoxide danger. Carbon monoxide CAN NOT be seen, tasted or smelled, so a detector is of extreme importance. Ok, I am done lecturing you on that subject.

# MAINTAINING THE FIRE

## (Shake down and top off)

First, and most importantly, give the stove as much air as it can take. Open the airflow draft all the way. Again, you can open the ash door, however, do not leave the stove alone. If you must leave the room, close the door. Add a layer of fresh coal on top, about 2 to 3 inches thick is usually sufficient. Allow the coal to ignite, remembering to watch for the "dancing" blue flames. Once they are dancing, you can shake down the ash using short, quick shakes. (If ash door is open, close it, duh). You only need to shake down until you see an orange glow in the ash pan. Allow a few moments for the fly ash to settle and the dancing blue flames to start again. This is a good time to empty the ash (see notes later in this guide). Do not allow ash to build up in the ashpan. It reduces airflow and can

cause damage and warping to the grates. Top off the stove again and allow the dancing blue flames to restart, adjust your air and you are good to go until the next time.

## SLICING, POKING AND CLINKERS

Have I confused you yet? If not, try this. Some stoves come with tools such as slicers and pokers for moving coal about in your stove. Not my personal favorite thing to do. More often than not it can cause a whole new series of problems. However, on some stoves it works just fine to use these.

A slicer is a long flat tool used to slice through coal allowing air to move through it. It is also used on some stoves to slice between the grates from underneath to move coal out of of the way so ash can drop through to the ash pan and to breakup clinkers. Pokers work much like slicers only they are a long, round rod with a curved end. I have used both before to loosen coal ash that has built up on the sides in front of the firebricks and has not dropped into the ash pan during the shake down process. The problem with this is, that it doesn't always help. Over time, the build up can become so thick that it is difficult to maintain the fire for long periods of time, in a case such as this, it is better to drop the fire and start over. Never use slicers or pokers to "stir" your coal bed. If you wish to drop some ash follow the directions for shaking down as described previously, there is less chance of clinkers developing that way.

Clinkers? You keep mentioning them, what are they? Clinkers resemble a porous rock and can block ash from falling through the grates. They can also jam in the grates. After a while you will need to shut down your stove and clean it out to remove the clinkers. They are caused by a variety of reasons, one is by stirring your coal. Don't do it, period. The cooler air will hit the burning coals and cause some to fuse together, they may continue burning for a short time but will not fully burn and breakup into dust. If your coal has layers of impurities in it, such as minerals, that do not burn, they can also cause clinkers to form. Prevention is usually the best medicine.

## ASH REMOVAL AND STORAGE

Do not allow ash to build up in your ash pan. It will restrict the flow of air to the coal, reducing efficiency and possibly smother your fire. Another reason not to allow the build up is that if it gets up to grates, it can cause an insulating effect. Combine that with the heat of the burning coals above the grates and you could warp or even break your cast-iron coal grates. In the middle of the winter is no time for a warped or broken grate.

When you shake down the coal make sure you allow enough time for the fly ash to settle before opening the door to remove the ash. Do not leave the stove distribution blower or your ceiling fans on when removing the ash pan. Your wife will maim you. Keeping the airflow in the room to a minimum will reduce ash that releases into the air. You can also make or purchase a cover for your ash pan that you can place over the top of the pan for

removal to the outdoors. The cover should have a wooden handle on it to avoid any possibility of being burned by the hot pan. Always use heavy gloves to prevent accidental burns.

Always store ash in a covered metal container OUTSIDE. Do not store inside the home as the hot coals are still giving off carbon monoxide and are still hot enough to melt through any other type of container. Coal ash can continue to burn for quite some time, so always err on the side of safety.

Some people will use coal ash as cinders for roads, driveways and sidewalks. I do not recommend this, as the ash leaves a powder residue that gets on shoes and boots and can be carried into the house. Your wife will have something to say about that, let me tell you.

Does coal have any benefit to a garden or yard, like wood ash does? No, it doesn't and when coal ash gets wet it feels more like clay and can pack and harden just the same. Dispose of it through your trash company or at a landfill or dump. Wood ash, however, has numerous properties that are good for your garden. I add mine to my compost pile or sprinkle directly into the flower beds. Then work it into the soil in the spring. If the wood ash comes from pressure treated lumber, DO NOT use it in your garden because it contains arsenic, a highly toxic chemical.

## ENDING NOTE

In conclusion, I encourage people to burn coal for heat and even for cooking. There is no other heat like it. It is a comforting, even heat, whether you use a convection blower or just let it radiate. Once, you are used to the quirks involved in starting, maintaining and using coal, you will never want to use anything else.

Your suggestions, comments and experiences are always welcome.