

PRICE \$3.00

# THE COAL BURNER'S ALMANAC

A Guide to Coal Burning  
along with the  
Owner's Manual for the

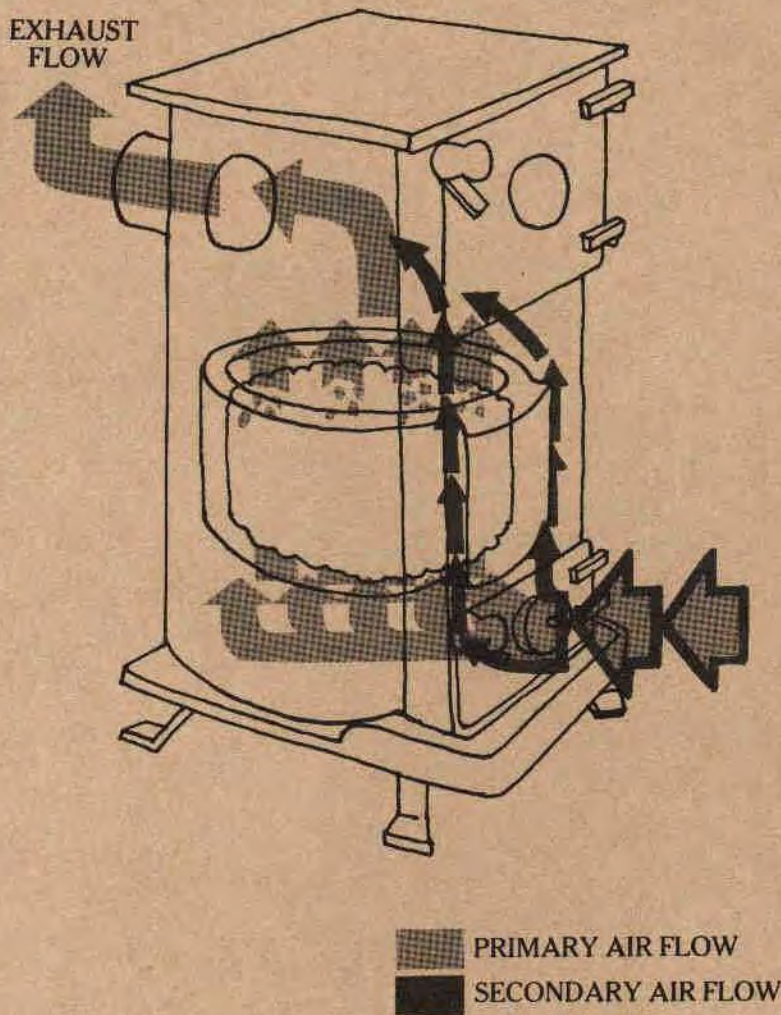
## CRANE COAL COOKER

4th EDITION

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CRANE STOVE WORKS INC., BOX 440, BRAINTREE, MASSACHUSETTS 02184  
MODELS 44/88/202/303

The body of the coal cooker is rounded, eliminating cold spots, poor burning areas and other problems created by corners. It is flat in front, allowing the fully gasketed door with heavy, high tolerance hinges, to remain air-tight. Air-tightness is

further ensured by its continuous welded steel construction outside and inside features a heavy, high temperature, refractory firebox lining fully cemented in place. At triple the cost of ordinary firebrick, it is only one example of the quality



incorporated into this stove.

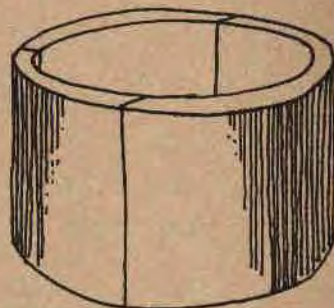
Other features include double baffling, with an inlet and outlet baffle. Also, we have designed a dual, secondary air channel containing a single control for intake air. Real glass\*, not an easily scratched substitute, is used for the viewing area, permitting control without having to open the door. The glass is also fully gasketed for air-tightness while plastic is not.

An essential feature contributing to our stove's efficiency is the rounded fuel bed and a large shaker grate system allowing the entire bottom of the coal bed to be shaken. No poking or scratching tools are necessary. In addition, there is an integral ash catcher area with a lip design for cleanliness and safety.

In addition, the following feature bears separate attention, not only for its importance now, but because it will become increasingly so in the years to come as you use and enjoy your Crane Coal Cooker.

## LINING

The purpose of a firebox lining of any sort is to protect the metal from being burned out while at the same time allowing for 1) efficient air flow, and 2) transfer of heat through the metal. Ordinary firebrick does a poor job of heat transfer. Our cast



refractory brick has many times the heat transfer ability of firebrick, allowing the heat to go into the room and not be retained in the stove only to eventually be lost up the chimney. In addition, because our lining is fully cemented in place, efficient air flow is maintained through the fuel, not wandering in and out of loose firebrick.

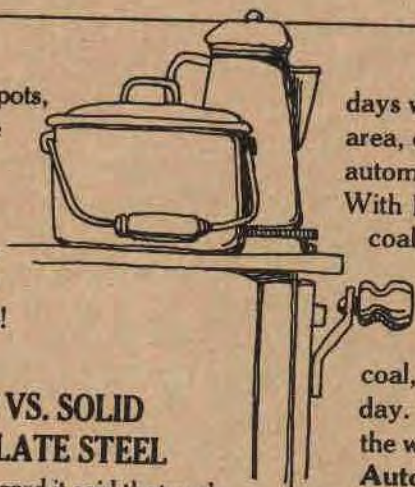
Our lining eliminates the need for certain types of basket grates which of course can crack or burn out. In addition, no removal of grates or baskets is necessary when you want to go to wood burning from time to time.

## THE COOKING SURFACE

As the Crane Coal Cooker cleanly and efficiently heats your home, it can simultaneously heat the evening meal. Stews, soups, or anything that requires long, slow simmering, can be placed on its huge surface and trivets of varying heights used to regulate heat. Your kitchen range is thus freed of these sometimes

\*During the 18th and 19 centuries, decorative viewing windows were made of mica, leaves of transparent, crystallized mineral.

cumbersome pots, space is made available for other food preparation and you save a few pennies in the process!



## CAST IRON VS. SOLID WELDED PLATE STEEL

You have heard it said that rock solid cast iron stoves are the best you can buy. Yes, their metal is thick and their designs are often attractive.

What you are not told is that cast iron can chip and crack. Solid welded plate steel can't. You're also not told that a cast iron stove is made of several sections that are screwed and gasketed together, forming an air-tight bond in the beginning, but after some use will loosen, creating spaces through which air will flow, affecting its efficiency and safety. Regular maintenance requires that the stove be taken apart and regasketed. A thin sheet metal stove that is screwed together is, for the same reasons, no better.

Solid, welded, plate steel is virtually indestructible. There are no seams or pieces, just one continuous formation ensuring air-tightness throughout its long life.

### MYTHS

**The 2-day Hopper:** Some European coal stoves have a storage area within the stove that holds a few

days worth of coal. This storage area, called a hopper, allows automatic feeding of the fuel.

With low ash content European coal, this is a fine feature

because very little shaking is required.

However with American coal, you should shake twice a day. You still can't go away for the weekend!

**Automatic Thermostat:** A control of this kind may be helpful in a wood stove because of the variance in heat output. A loading of wood produces significant changes in heat output over the duration of that loading. A loading of anthracite coal in a well-designed coal stove burns and maintains even heat throughout the cycle, making a control device unnecessary. As a matter of fact, a control device that malfunctions could easily cause overheating and become a safety hazard.

**A Blower Unit:** A blower on a stove can certainly move heated air faster, but it's impossible to produce more heat with one. Some blowers remove the heat so fast from the firebox that improper combustion is the result. The on and off regulator of an oil burner or the cyclical heating effect of a wood stove will benefit from a blower at times, particularly in the morning when your wood stove is almost out. After a quick recharging of wood, a blower will move hot air while the

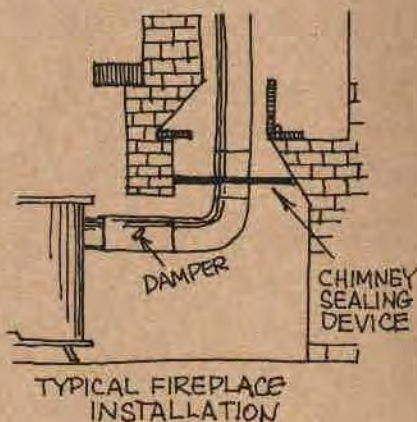
stove is not fully heated. A quality coal stove that is properly designed remains fully heated, especially with a heavy firebox lining, making a blower marginal at best. If you have a central air circulation problem in your home that prevents adequate movement from room to room, there are better methods than a blower that does not require dangerous electricity to scamper around a hot stove. Examples are old-time ceiling fans or a small fan in a wall. However, Crane offers an exceptionally fine blower system as an option, but we suggest that you may or may not need it for the layout of your particular home.

Installation of the optional blower is simply four nuts and bolts connecting the motor to the metal frame. Notice that the motor can only be mounted in one manner and the electrical cord directly plugs into a standard wall outlet.

## HOW TO PREPARE YOUR FIREPLACE FOR OUR STOVE

Have your masonry chimney inspected, cleaned, repaired and otherwise readied for installation. Have its condition approved by a local building inspector or fire marshal. Make absolutely certain that the chimney is not being used for another heater or an open fire in another fireplace unless specifically authorized by a properly licensed heating contractor and the local authorities. You should then block off

the entire upper damper area with a nonburnable material and cut a 6" diameter hole for the flue connector pipe. This pipe should have a vertical rise of at least four feet to provide a good draft before it exits into the chimney. Under no circumstances should the non-insulated pipe pass through a wall or ceiling. The stove may rest directly on a multiple brick laid hearth or the standard 1/4 inch thick asbestos millboard covered by 28 gauge steel or its equivalent.



## INSTALLATION

Please plan on installing the stove when you have plenty of time on your hands and use a day when the hardware stores are open. Keep your heat on in the house. Don't try to heat the house with the stove the first few days. Ask any wood stove owner, and they will tell you that it takes a little experience with even the best wood stoves. Coal stoves are

easier to operate, much less tending, etc., but usually take a bit more patience at first.

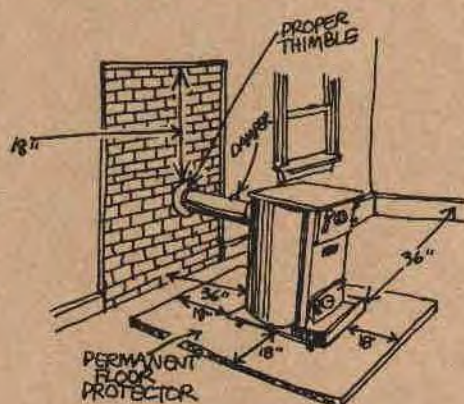
The Crane Coal Cooker, like other quality solid-fuel heaters, should be installed with three major considerations: the clearances to the other parts of the room, the connector pipe, and the use of a proper chimney.

First, instructions on clearances: no part of the stove should be closer than 36"<sup>\*</sup> from any combustible material (a material that might catch fire like wood floors, walls, chairs, etc.). Non combustible materials (like steel, asbestos, brick, etc.) may be no closer than 18" from the stove. The stove should rest on a permanent floor protector, equal to or better than a 1/4" thick asbestos millboard, covered by 28 gauge steel extending a minimum of 18" around the outside of the stove.

Second, a flue connector pipe is that section that connects from the stove to your chimney (either your factory-built or your masonry chimney). This pipe should be no closer than 18" from any combustible material. It shall be a 6" diameter, 24gauge or heavier steel. This is to be securely fastened with two screws to the flue collar of the stove. This flue connector pipe may have up to a three-foot horizontal section with an upward slope of 1/4" per foot before

it enters your chimney. It should be well supported until it is securely placed into your factory-built masonry chimney. You may install a 6" cast iron damper in the flue connector pipe. Generally speaking, depending on your draft, you should keep it open when using coal. You may find closing it slightly, after a good wood fire is already going, is helpful.

It is recommended that you do install a manual damper, (they're quite inexpensive), but don't try to close it until you have learned coal burning. Closing the manual damper somewhat, can provide a slight increase in efficiency, but knowledgeable operation of the stove itself is far more rewarding. The manual damper should be installed as close to the stove as possible. A barometric damper is of little use in a well designed air tight coal stove. It is not recommended and is not needed



\* There is one exception. The models 202 and 303, instead of 36" from the stove, may be as close as 28" from the stove to a combustible.

TYPICAL STOVE  
INSTALLATION

with a Crane unless your inspection authorities like it!

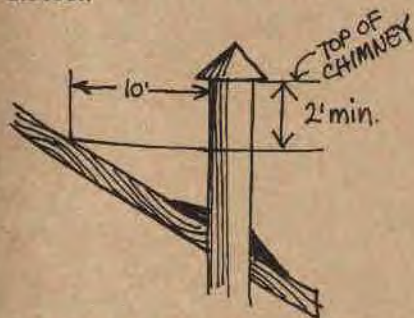
Third, instructions on a proper chimney: in the case of a factory-built chimney, you should only use a properly insulated and approved unit that is installed to the manufacturer's instructions. These instructions include specific limitations as to clearances from walls, ceilings, roof, etc. In the case of your masonry chimney, you should have it cleaned, inspected and approved (usually by a local building inspector or fire marshal). It should be in good repair with no cracks and be free from past creosote buildup. The chimney should not be used as an existing flue for another heater or for an open fire in a fireplace unless specifically authorized by a properly licensed heating contractor and the local authorities. In the case of a fireplace, you should block off the entire space around the flue connector pipe. This pipe should have a vertical rise of 4 feet minimum before it is allowed to exit into the masonry chimney area. This provides a good draft. Under no circumstances should the non-insulated flue connector pipe go through a wall or ceiling. As previously described, this pipe may be no closer than 18" from any combustible material. Again, should you be using a proper factory-built chimney, and you follow the manufacturer's instructions, a good installation should prevail. However,

should you be building, or trying to utilize, an existing masonry chimney, the door is open for increased mistakes. We do not wish to take the place of your own contractor or your own common sense, but we do wish to offer the following 10 rules of masonry chimney basics:

1. A safe masonry chimney must have a tile clay liner. Such liners are smooth and hard and scratch easily. Liners are made of material like a clay flower pot, but are harder. Such a liner protects the masonry exterior from the flue gases.
2. The chimney must not be used to support any part of the structure, otherwise, a settling or shifting of the house will crack the chimney. There should be two inches of free clearance around the chimney. This keeps excess heat from igniting combustibles.
3. A chimney used for wood heat must be built from the ground up. A chimney supported by brackets can be easily damaged by a chimney fire and a house fire may result. A shifting or sagging of the bracket will cause the chimney to crack.
4. If your chimney has more than one smokepipe inlet, cover these with a piece of tile clay liner and fill up the inlet with masonry material equal to the chimney thickness. Thin metal snap-in covers are not safe. The initial explosion of a chimney fire often blows such a cover out of the chimney. This opening would then provide oxygen for the chimney fire.

You can no longer control it and many times the house catches fire at this point.

5. A chimney must extend above the roof.



6. Your chimney must have a metal cleanout door at the bottom. You need this to remove the soot loosened after a chimney cleaning. Otherwise, the chimney will eventually fill with soot and plug the smokepipe resulting in a housefull of smoke. The cleanout door is really handy for inspecting the inside of the chimney. You do not have to stand on your head—just use a mirror to see inside.

7. Another reminder is to check the inside of the flue with a mirror before the heating season. It is surprising what can happen. On one occasion, a chimney was blocked with a wad of insulation which blew over from a nearby construction project.

8. Vent only one heating device into a chimney. Several things can happen including an automatic furnace failing to ignite and raw fuel is pumped into the chimney. Hot exhaust from a wood fire could then

cause an explosion. Fuel oil furnaces and space heaters often fail to function properly, wasting fuel and may cause a house full of smoke. What happens if a chimney fire occurs? You cannot control it because you cannot shut off the draft openings of a gas or fuel oil device. With only a wood space heater vented into the chimney, you can control the chimney fire by shutting off the draft (air supply). Dangerous combustion gases also may be forced into the dwelling.

9. If you plan on building or using an exterior masonry chimney, it should have eight inches of brick around the flue liner. This thickness is necessary to keep the gases from cooling and forming creosote.

10. Now, for the don'ts. Do not use an old chimney without a tile clay liner. Do not use a chimney built on brackets. Do not use a chimney with poor mortar. Do not use a chimney built outside the exterior wall of the dwelling made of concrete block for wood heat. This type of chimney is too cold, promotes creosote buildup and has a very high chance of a chimney fire. Also, this type of chimney has a short life. Concrete block can be used for an inside chimney as long as the part above the roof is built of brick or stone. In other words, use a warm chimney surrounded by warm rooms.

Because of intake air, this stove is not for use in mobile homes.

Should you have any question as



to proper installation, you are strongly urged to seek specific advice. Too many severe accidents have occurred because of faulty installation. You may consult with the manufacturer and your local stove dealer in addition to the building inspector and fire marshal in your home town or state government. For further information on using your heater safely, obtain a copy of the National Fire Protection Association publication, "Using Coal and Wood Stoves Safely," NFPA, NO.HS-8-1974. The address of the NFPA is 470 Atlantic Ave., Boston, Mass. 02210.

## OPERATING INSTRUCTIONS

A stove is not a plug-in appliance. Successful operation requires patience and preparation.

After your Crane Coal Cooker is properly installed and you have received your local permit you are ready to begin enjoying the heating value. The initial firing of any stove produces a miserable odor and some fumes from the oil in the metal. Some people prefer to initially fire a stove outdoors the first few hours.

First you should burn wood for a few days. The firebox lining is to be brought up to temperature to ensure its proper ability to withstand a hot coal bed.

The glass in any stove is going to get quite dirty with wood burning. This is carbon and creosote building up on the glass. However, a good

coal fire will hardly dirty the glass at all.

Now for starting your first fire. Open your flue damper, close the ash door and open the round air control all the way. Crumple small pieces of newspaper and place in stove and ignite with a match. Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or freshen up a fire in this heater. Keep all such liquids well away from the heater while it is in use.

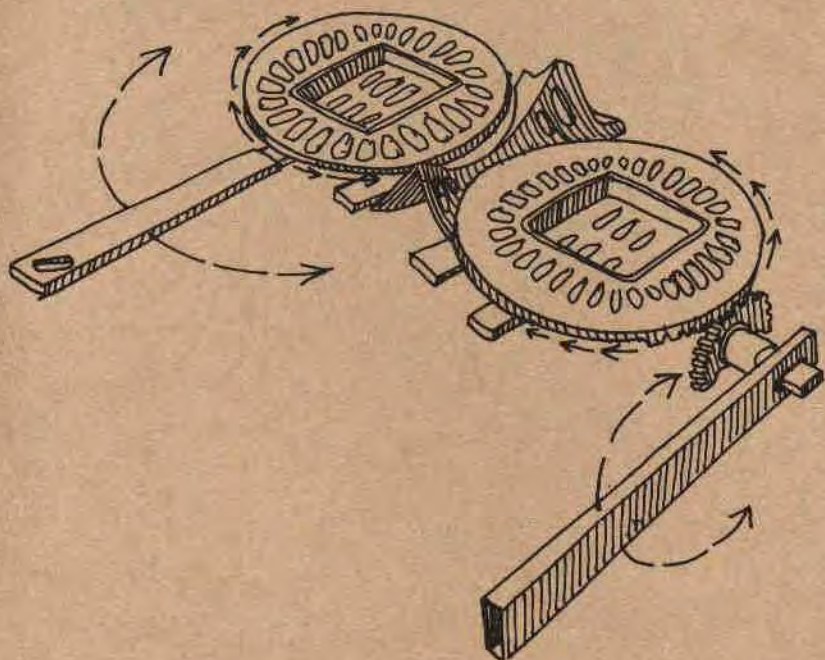
Continue burning newspaper for a half hour. This preheats the lining, the stove, and gets a slight draft going. Try not to develop a high flame fire for a few hours. This will allow the stove paint to bake in properly. Now slowly add small wood pieces and continue burning for another half hour. Now add larger logs, wait until they get started, then set the air controls so a good average burning continues. Use the stove in this manner for a few days until you get well accustomed to a fine air-tight well-controlled, wood stove. Practice with its controlled burning by adjusting the flue damper, the round air control, the grate system and the top door opening and closing. Because each installation has its own draft peculiarities, practicing with your specific system will be quite worthwhile. The doors should be closed at all possible times. Never

leave the doors open when the stove is unattended. Caution: keep ash door closed during firing of the heater to avoid developing excessive temperatures.

Now that you have mastered the art of wood burning, you are ready to develop a good coal fire. First, make sure you already have the stove fully heated with a wood fire as explained above and a good 4" bed of red-hot wood coals. Open the flue damper and the round air control all the way. Add one small shovelful of coal, shut doors, and wait approximately 10 minutes until the coal is burning well. Repeat with a few pounds of coal until a large bed of coal is red hot. Only

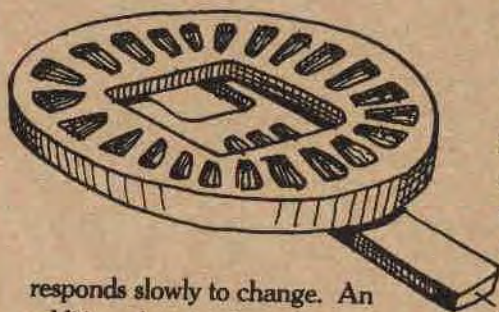
now should you turn the air control down to adjust a slow even burn. When adding several pounds of coal, you should have a good coal bed already going. The general rule is: never add more coal than the amount already going.

When there is a full or near full hot coal bed completely ignited, you may vigorously shake the grate. Shake from side to side so that the entire round grate section rotates. Don't shake in and out because this only moves the dump slide. Shake at least once a day but not more than twice. Don't shake when the fire is low! Never disturb a coal fire before adding coal. To regain your fire,



open air controls and wait 5-10 minutes, then add small amounts of coal at similar intervals, waiting for each load to thoroughly ignite. You may then shake lightly.

It is a common misconception to think that adding more coal will produce more heat as is the case with wood. This is not true because coal



responds slowly to change. An addition of coal reduces heat output for about 15 minutes.

Any coal stove should be filled to a specific depth of coal. If the depth is shallow, it will not sustain itself. Too deep and it will form clinkers and pockets and be inefficient. American anthracite coal should always have the following depth of fuel bed:

Pea Size 4 to 6 inches

Nut Size 6 to 9 inches

Stove Size 9 to 15 inches

When adjusting the stove for an overnight burn, make sure that it is shaken down completely, loaded with fresh coal with the fire going well and that it is closed up properly.

It's really easy with patience and a little practice with your installation. As a matter of fact, as the weeks go on, you will be amazed at how easy it

is to maintain a slow, clean, even heat with coal.

You will find that shaking down the ashes externally (with all doors closed) is not as effective in any stove as direct internal shaking (with the bottom door open). That is why all Crane stoves provide for internal direct shaking. In addition, internal shaking allows you to watch for hot coals dropping, which is a good signal to stop shaking. However, internal shaking is sometimes dusty, which is why you want to get a good draft going and have the top door closed while shaking. This is why a good coal stove must have both a door

above the firebox and a separate door below the firebox. Now you know why a single door coal stove, or side by side doors are quite troublesome for easy burning of coal, and as a matter of fact, they are really wood stoves, modified as a coal/wood combination.

There is a nice and easy routine used once in the morning and once in the evening. Just follow these instructions for flawless operation:

1. Open bottom air control all the way (for increased draft, you open the bottom door, but only during this process).
2. Wait 10 minutes. This allows a good draft to develop.
3. Open top door and add one fourth the amount of coal you would use on a daily basis. (usually 20 to 30 pounds are

used daily). Close top door.

4. Wait 10 minutes. This allows fresh coal to get started in preparation for shaking.
5. Shake vigorously for approximately 30 seconds.
6. Open top door and add one fourth the daily amount. Close top door.
7. Close bottom door and adjust bottom air control for a long burn. This is usually 1/8 inch (2 turns) for the Model 44 and 88, or 1/2 inch (7 turns) for the Model 202 and 303. The exact setting depends on your chimney, the quality of the fuel, your comfort level the outdoor temperature, gusty winds, and some even think the setting depends on the moon!

On a daily basis, you should remove the ash that accumulates in the bottom of the stove. Unlike most wood stoves, the grate system allows for easy access to the ashes without trying to clean around the good hot coals and the fuel. Simply use any standard fireplace shovel and remove the ashes. Should a small amount remain after each cleaning, it does not matter at all, just as long as you do not let them build up more than a two-inch depth. If the ashes are allowed to accumulate near the grate, you are asking for trouble in any stove. This will block the air from flowing through the grate. The air flow is what keeps the grate from

overheating or cracking. Remember, cast iron is easily susceptible to cracking, especially when heated. Disposed ashes should be placed in a metal container with a tight-fitting lid.

The closed container of ashes should be placed on a non-combustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled.

Creosote formation and the need for removal-when wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning wood fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire.

The chimney connector and chimney should be inspected at least twice monthly during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated, it should be removed to reduce the risk of a chimney fire. A similar explanation is that creosote can be the result of the incomplete combustion of wood. When combustion is not complete or when wood doesn't burn completely, unburned gases are given off. These unburned gases will be drawn through the stove into the smoke pipe and

exhausted up the chimney. When these unburned gases cool down, creosote results. The colder they get, the harder the creosote forms. The harder it forms, the harder it is to remove. Creosote is still combustible and it will burn uncontrollably if ignited. Creosote buildup can be avoided or kept to a minimum by: 1. burning only seasoned dry wood, 2. maintaining hot fires, 3. using inside chimneys and 4. using coal.

In the event that you should experience an uncontrolled or runaway fire in the stove, smoke pipe (flue connector pipe), or chimney, do the following immediately:

1. Close all doors, dampers, air controls, etc., on the stove. This will starve the fire of air and cause it to die down.

2. If there is a manual damper in the stove pipe (flue connector pipe), start closing it down slowly.

3. Call your local fire department.

4. If the fire is brought under control without any serious damage done to the building, and the stove appears to be operational, check it over thoroughly before putting it back into service.

5. Carefully examine the stove, dampers, controls, smoke pipe (flue connector pipe), and chimney from top to bottom. By following these basic steps you bring the fire under control. The time it takes to bring it under control depends upon the amount of fuel in the stove and the rate at which it is burning at the time it is detected. Smoke detectors and fire

extinguishers are an absolute must and should be a standard part of any heating system.

## MAINTENANCE AND SPARE PARTS

You should check your stove after each heating season. Any sign of rust can be touched up with paint. Should the gasketing lose any of its air-tightness by becoming frayed or otherwise damaged, it can be easily replaced. The firebrick will remain intact unless subjected to abuse, but if replacement is necessary, the sections can be removed easily through the door. You may then install the new sections using standard furnace cement.

If a piece of coal gets stuck next to the lining, simply wait a few minutes to continue the shaking process. That piece of coal will get hot and soft, thereby relieving any pressure. However, should you overshake, excessive force may cause the bottom inch of the lining to wear away prematurely. Proper care, using good quality anthracite, should result in a few years from only one set of refractory linings. Refractory is not only more efficient, but you don't have to worry about cracking a cast iron basket grate.

Your chimney should be kept clean and free of creosote, and be professionally and properly maintained. The flue connector pipe should be free of any defects and replaced if one becomes apparent. Whenever possible, dismantle it and clean it out. A twice-monthly

inspection of both is advised.

If your chimney is a factory built stainless steel insulated pipe, you should make sure it is cleaned immediately after the heating season to avoid any condensation mixing with the soot, which may cause a shorter chimney life.

Intense heat will not break the glass but one drop of water or a flying wood spark will. When you install new glass, replace the gasketing around it as well.

Don't bother to keep the glass clean. When the stove is operating properly, it cleans itself just like the best self-cleaning oven.

Replacement spare parts are not warranted and it is suggested that you buy such replacements before you need them. Spare parts are in stock and parts may be purchased through your local dealer, or when necessary, ordered from the factory, subject to a \$20.00 minimum charge and a six week delivery.