

The
PROPER
OPERATION
of the
HOME
HEATING
PLANT

SIMPLE RULES FOR SAVING FUEL



*A BOOK OF INFORMATION
applying to all forms of
heating systems*

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MINNEAPOLIS HEAT REGULATOR CO.
Established 1885
Minneapolis, Minnesota

INTRODUCTION



AS a general rule, saving means privation; and the average American family, with high standards of living, is reluctant to accept a plan that involves self-denial of comforts and luxuries.

In that respect, this little booklet is a paradox. It shows you how to save—but it preaches no self-denial or privation. On the contrary it preaches greater luxury, greater comfort, and even greater ease!

For it deals with an unusual situation, a case where saving and luxury come hand in hand! They both come through *knowing how!*

In every home, for seven or eight months out of each year, the question of keeping comfortably warm is one of the most important family problems. It is at least equally important with the problems of food and clothing.

And yet, as important and as widespread as the question is, there is probably no phase of our every day existence which is so little understood. It is literally true, that the great majority of householders assume there is nothing to do, after a heating plant is installed in a home, but to start a fire and shovel on coal as needed to keep it going.

The result is uneven periods of excessive heat and cold, enormous wastes of fuel, and no end of bother and muss of tending to the furnace.

And the results of improper heating are not confined to discomfort. Statistics show alarming increases in sickness due directly to it.

About one-third of all the deaths in this country are due to respiratory diseases. In the last 50 years practically all other forms of bacterially caused diseases have been brought under control, while respiratory diseases have increased. Pneumonia is one-third more frequent in urban than in rural districts.

Of the total annual deaths about 40 per cent occur during the winter months, 24 per cent during the fall and spring quarters, and 10 per cent during the summer. In other words, the highest death rate occurs during the heating season.

With the vital importance of proper healthful home heating uppermost in our minds, therefore, we are publishing this book which we hope will exercise a powerful influence in the direction of better education on the handling of the home heating plant.

We have tried to make the book simple and concise enough to be of real benefit. Many books that have been published on this subject we believe are too complicated and technical to be of much assistance to the average householder whose interests and training are entirely non-technical.

We have therefore boiled down the subject to its basic rules and stated these as simply as we know how.

We are confident, therefore, that "The Proper Operation of Your Home Heating Plant" will find a place in your home, that it will be preserved for reference, and followed closely enough to bring you the many benefits that come with more careful handling of the home heating plant.

Actual money saving comes with greater comfort, greater convenience, and more healthful homes, when the home heating system is understood and fired properly.

A careful reading of this book will pay you dividends in health and happiness, as well as in cash!

THE PURPOSE

of the Drafts and Dampers



NEARLY all warm air furnaces and boilers, either round or sectional, have, or should have, the following dampers:

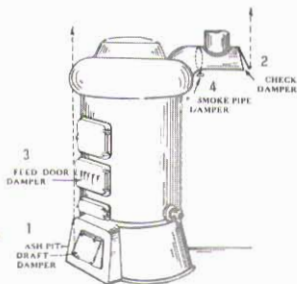
(1) Draft damper. Usually a lift door located at rear of the boiler, on the side of the boiler, or in the ash door. This draft damper admits air for burning the fuel.

Therefore, the proper control of this damper is most important.

(2) The check damper admits air into the smoke pipe leading to the chimney. It is not always placed as shown on the cut. Sometimes it is cast right into the top of the boiler. As the opening of this check damper allows the chimney to pull air directly into it instead of through the fire bed, it checks the fire. It is most important that this check damper be of ample size. If it is not large enough, air will continue to be pulled through the fire up through the crevices and leakages around the base of the heating plant or the draft door, thus defeating the purposes of the check. If a heating plant overheats the house even when the draft damper is closed and the check damper open, it is evidence that the check damper is too small for the size of the chimney.

(3) The feed door damper. The regulation of this damper varies with conditions and type of fuel. Its proper use must be determined by experiment. When fully open it checks combustion by cooling the heated gases before they are burned. When opened partially it may improve combustion by furnishing additional oxygen to burn the gases.

(4) Smoke pipe or butterfly damper. This damper is of value in case of excessive chimney draft, and is used particularly in windy weather to cut down the capacity of the smoke pipe to normal. It should always be placed in the smoke pipe between the heating plant and the check damper. Oftentimes this damper is also built into the boiler.



Location of drafts and dampers

GENERAL RULES

for Fuel Saving and Plant Operation

Applying to All Forms of Heating Systems



1. Be sure your heating plant is the right type and size for your house, and correctly installed.
2. Make a careful study of the plant you have chosen. Unless you understand it thoroughly, you can't operate it satisfactorily.
3. Always see that your heating system is kept in first-class condition. Have any defect repaired as soon as you discover it. Keep registers, radiators and all ducts free from accumulations.
4. Pipes carrying hot air, water or steam should be heavily insulated. Boiler surfaces should also be insulated. Any of several good fire-proof, non-conducting materials may be used.
5. Flues and heating surfaces should be cleaned at the beginning of the heating season and kept clean. Some heaters require a weekly cleaning. Dust and soot which accumulate, hold the heat and prevent it from doing the work it should. This is a common cause of fuel waste.
6. Clean out the ash pit every day. An accumulation of ashes interferes with air circulation and draft, preventing proper combustion. Neglecting to remove ashes may also result in burning out the grates.
7. Shaking the grates once or twice a day is generally sufficient. Before shaking a low fire always put on fresh coal and allow it to ignite. Shake gently with a short, quick stroke and only until a glow of fire shows in the ash pit.
8. A coal fire should never be poked from above. If clinkers form they should be removed with a minimum disturbance of the fire. Break them up through the clinker door and remove from below if possible. With coke, clinkers form more easily, as a rule, and in a larger size. They should be removed from above while the fire is hot and before adding more fuel.

9. In mild weather leave a thicker layer of ashes under your fire, above the grates.
10. Whether you burn hard or soft coal or coke, keep a deep fuel bed so the fuel will not burn through in spots. A deep fuel bed is the most economical in any weather. When adding fuel, fill the fire pot to level of the feed door, rounding it up in severe weather. This method is far more satisfactory than putting on small quantities of fuel several times a day. In firing, be sure to leave one bright spot uncovered so the gases will ignite and burn off gradually.



If you burn hard coal or coke, be sure to get the size that's best suited for your heater. Consult your coal dealer. If you burn soft coal, break up the lumps to a size no larger than a coconut.

11. Dry heat is unhealthy. Provide the proper humidity and you will be able to keep the rooms not only more healthful but more comfortable at a lower temperature. Consequently, less fuel will be required. 68 degrees is conceded to be more healthful than 70 degrees if the proper humidity is maintained. See special instructions on the following pages covering humidity for the type of heating system in which you are interested.
12. Proper ventilation is an absolute necessity in every home, yet it should not be obtained at the expense of the heating plant. A fire-place serves as a foul-air flue. Foul-air registers also help to solve the problem of ventilation. Then, too, there is always an inflow of air around windows and doors. Too great a leakage of air, rather than lack of ventilation is generally the case. Storm windows, doors, weather strips or calking material should be used, especially for the north and west rooms. The best kind of ventilation is that which is properly planned instead of relying on the infiltration of air through doors and windows.
13. An insulated house means economy of fuel. If you are building a new home, it will pay you to specify a good grade of insulating material for the walls and roof. It adds to the *comfort of the home and reduces fuel consumption.*

14. Lower the window shades at night. This prevents loss of heat.
15. A warm cellar indicates poor heating efficiency. Look for the cause. It may be due to an improperly constructed cold air duct, wrong placement of warm air pipes, or insufficient insulation on heating plant and pipes.
16. A uniform circulation of warm air, water, steam or vapor to all parts of the system should be provided. If this is not obtained, have a heating expert inspect the plant.
17. Don't permit the house to cool off more than about 10 degrees at night as a lower drop is false economy. More fuel is required to bring up the temperature in the morning from a low level than to maintain a moderate degree of heat during the night.
18. A cool bedroom means invigorating sleep. Keep the bedrooms cooler than the living rooms.
19. Control your heating plant by a Thermostatic Heat Regulator. It takes complete charge of dampers, drafts or valves. Saves work and worry, promotes health, saves one-fifth to one-third on fuel. No modern heating plant is complete without automatic regulation of temperature. More detailed information on this subject is given in this booklet, beginning on page 13.

Special Instructions for Care of Warm Air Furnaces



1. For greatest economy, the furnace should take its supply of air from inside the house. This is especially true in cold, windy weather. Regulate the cold-air intake to avoid the need of warming too much outside cold air. You will get greater comfort with less fuel consumption thru the proper regulation of this intake.
2. Loose joints allow dust and smoke to get into the heated air. Have your furnace inspected regularly and see that the joints are kept tight.

3. Always keep water in the water pan. This requires daily attention. Don't neglect it. It is an important factor in fuel economy and health. It is also a good plan to place jars of water near registers that send up the most heat.
4. All warm-air pipes should be insulated. Each pipe should be equipped with an inside hand damper so any room may be shut off, if desired. Label each pipe so you know which room it leads to.
5. If any pipe fails to carry heat to its room, partly close the dampers in the other pipes so as to supply a greater volume of warm air to the cold pipe and force the cold air out. After the warm air begins to come through, readjust the dampers to normal position.
6. Carefully study instructions furnished by the manufacturer, for operating your particular furnace. No two furnaces are alike in handling. Know your furnace and remember that the rules for its operation are based on the experience of men who should know more about the operation of that make of furnace than anyone else.

Special Instructions for Care of Hot Water Heating Systems



1. Cold air must be expelled from the coils before the radiator will become hot throughout. If the upper part of the radiator remains cold, open the air valve and let the air escape.
2. The expansion tank is usually located above the level of all radiators. Water should always show in the glass gauge on this tank and should be kept up to the level indicated.
3. Put clean water in the boiler at the beginning and end of each heating season—at least twice a year. Three or four changes of water are still better.

4. There is usually very little loss of water in a properly operated hot-water system. Never let in cold water to the system when you have allowed the water in the heating to boil over at the expansion tank. It may result in a cracked heater section. Cool down your fire by adding fresh fuel and closing draft damper and opening feed door. When water temperature drops to 100 degrees, then add sufficient amount of fresh water to raise level in expansion tank to proper point.
5. Occasionally inspect the covering on pipes and boiler. If it is broken away and permits loss of heat, replace, where necessary at once.
6. No provision has been made in hot water systems for supplying moist air. This may be done by placing a pan or jar of water on the radiators, or by obtaining a specially-made pan which hangs on the back of the radiator.
7. When you open a window over a radiator open it from the top, and throw a blanket over the radiator. This prevents a direct draft on the radiator which would result in cooling down the whole system.
8. Never shut off a radiator in a room where the temperature will reach freezing, without draining it. Many radiators are cracked or broken thru neglect to follow this rule.

Special Instructions for the Care of Steam or Vapor Heating Systems



1. Cheap radiator valves are poor economy. They soon begin to sputter and leak, fail to expel the air,—and then, cold radiators! If your radiator valves fail to work satisfactorily, and the radiators are cold, replace them with new ones of a high grade.
2. The boiler should be emptied and refilled with water at the beginning and end of every heating season. Let out a pail of water from the bottom once or twice a week and replenish with clean water. Do this regularly and keep your boiler clean.
3. Whenever you fix the fire, note the glass water gauge. Turn the exhaust cocks above and below gauge occasionally to make certain there is a free passage from boiler to gauge.

4. Keep the gauge half full of water. Half the space is needed for steam. If the water is not kept to the half-way level, injury may result to the boiler.
5. Steam radiators reach a higher temperature than the radiators on a hot water system. Therefore, a pan of water placed on the radiator or hung from the top will supply greater humidity. Or, special valves may be used for this purpose to supply steam direct from the system.
6. When you open a window over a radiator open it from the top, and throw a blanket over the radiator. This prevents a direct draft on the radiator which would result in cooling down the whole system.
7. Never shut off a radiator in a room where the temperature will reach freezing, without draining it. Many radiators are cracked or broken thru neglect to follow this rule.

General Instructions for Firing

Anthracite or Hard Coal



ANTHRACITE, or hard coal, needs no attention. Leave the coal bed alone. Poking the fire from the top either causes clinkers, delays combustion of the coal, or possibly puts the fire out.

Where clinkers form, have a good body of fuel in the fire pot before removing the clinkers. Otherwise removal of the clinkers will lower the bed of coals so low that the fire may possibly go out.

Never let the bed of coals get too low in the fire pot. In mild weather keep the fire high by allowing ashes to accumulate on top of the grates, rather than carrying a very thin fire.

Never shake the grates violently at any time. Rock them slowly back and forth with a short stroke of the wrist. This will allow only the fine ashes to sift through. If more strength is necessary, look for clinkers and remove them. Stop shaking as soon as a red coal is seen in the ash pit. It is wasteful to shake hot coals through the grates.

Coke

Coke burns very rapidly and requires very little draft. Oftentimes when the draft of a heating plant is insufficient for hard or soft coals, coke will solve the problem.

When burning coke, it is nearly always necessary to keep the smoke pipe damper almost completely closed.

In banking the fire at night, it is wise to have a bed of ashes over the grates to reduce the draft. Level the fuel bed, and fill up as high as possible with fresh coke. Oftentimes it is advisable to have a smaller size of coke or hard coal for banking at night to hold the fire.

Coke is clean, easy to handle, and heats very quickly; thus it is extremely hard to control except by automatic heat regulation.

Soft Coal

Soft coal is divided into two classes—pocahontas or eastern caking soft coal, and free burning, or non-caking soft coal.

The difficulties encountered when firing this type of coal are generally caused by smothering the fire and completely covering the red hot coals when adding new fuel. Always leave a hot spot exposed on top of the fuel bed to ignite and burn the gasses in the new fuel.

It is advisable at night to wet thoroughly the next day's fuel supply so that it will cake better, and the small particles will not be wasted. Break up the large sizes into small lumps the size of a cocoonut, or smaller. Use the large sizes around the outside edges of the fire pot, and fill the inside or center with the fine coal. Frequently with this type of fuel the entire top of the fuel bed will cake over. When this happens, simply break up the cakes with the poker, but do not turn them over.

The principal difference between the pocahontas and free burning soft coal, is that the latter requires less draft.

In firing with free-burning type of coal, the large lumps should be broken up to smaller lumps, about the size of a fist.

When firing, level the fire bed and fill full of coal, putting the lump on first, then covering with finer coal. As with pocahontas, do not cover the entire bed with fresh coal, but leave at least one point where the flame is coming through, in order to burn the gasses.

Proper regulation and control is essential to burn soft coal satisfactorily.

The IMPORTANCE of Automatic Heat Regulation



EVEN though you select the correct heating plant for your home, install it correctly, care for it properly and operate it intelligently, it may still fail to give you the satisfaction it should.

Proper heat *regulation* is one of the big factors to be taken into consideration. And proper heat regulation can be obtained in only one way—by *automatic control* of dampers, drafts and valves. When this task is done *by hand*, a wide temperature range is bound to result. The room temperature is seldom just right. Someone forgets and the thermometer jumps several points past 70 degrees. Perhaps the next time a thought is given to the fire it is nearly out. Then, a trip to the basement with its inconvenience and waste of time. Such are the difficulties that always accompany hand regulation. And the result is discomfort, danger to health, and fuel extravagance. All the objectionable features of hand control are eliminated by the MINNEAPOLIS HEAT REGULATOR.

Just Set the Indicator

That's how easy it is. No chains to fuss with, nothing to do but set the indicator for the temperature you want, and wind the clock. That is all there is to your part in automatic regulation of temperature. The MINNEAPOLIS operates dampers, drafts and valves with a scientific thoroughness and accuracy that is impossible by hand. It never fails, never sleeps, never forgets, and is built for a life-time of service.

What It Consists of

The MINNEAPOLIS HEAT REGULATOR consists of an attractively designed thermostat (a mechanical automatic thermometer) placed on the wall of the living room and connected by a small concealed electric cable to a motor in the basement. This motor performs the work of operating the drafts, dampers, checks, valves or other regulating parts of your heating plant.



"Convenience" from the painting by Philip Lyford.

You set the indicator at the degree of temperature you want in your rooms and the Room Thermostat maintains that temperature exactly. If the weather becomes colder and more heat is required to maintain a room temperature of 70 degrees, the sensitive thermostat actuates the motor to advance the fire. If it becomes

warmer outside and less heat is required to maintain the desired room temperature, the thermostat acts to check the fire.

The Room Thermostat is 100 per cent automatic. It provides not only heat control such as the Valve on a radiator may give you but actually *regulates the temperature*.

The Room Thermostat maintains indefinitely any temperature you desire. And it does far more than this. By means of the clock it changes that temperature at any time you wish to a higher or lower level.

For example, you desire a temperature of 70 degrees during the day. But at night, when you retire, you want your rooms cooler. When you arise in the morning you want the rooms warmer again. So you set the indicator to correspond with your wishes. Accordingly, the Room Thermostat keeps your rooms at 70 degrees during the day. At 11:30 P. M. or any time you indicate, it automatically lowers the temperature to 60 degrees. At 7:30 A. M. or at the hour specified, it automatically changes the temperature back to 70 degrees. *At any time you desire you can have the temperature you want.*

A New Freedom

Many women who have found it necessary to forego the afternoon shopping or matinee because someone had to stay in to "watch the furnace" are freed from this obligation by the Minneapolis.

They can leave the heating plant in charge of the Minneapolis, secure in the knowledge that even if a blizzard strikes in their absence, the house temperature will be just right when they return, when the children get home from school, or when the husband arrives from his day's work.

Many users tell us they have not paid any attention to drafts, dampers or valves for years. Some have not even reset the indicator for years.

An Extra Hour of Sleep

No one needs to get up earlier than the others to "rouse the fire" in the Minneapolis-equipped house. You sleep in a room whose temperature is 60 degrees—the healthful temperature—and the



"Comfort" painted by Philip Lyford. This beautiful picture tells the story of perfect warmth achieved at the rising hour.

whole house is comfortably warm when it is time to get up in the morning. For the Room Thermostat automatically raises the temperature to day-time warmth at the desired hour. In most households this means an extra hour of sleep for someone.

Healthful Heat

It is especially important that the temperature be kept uniform where there are old people or young children. They are extremely sensitive to temperature changes. With the Room Thermostat in

operation you *know* that just the right temperature is constantly provided. The house is never too warm or too cold—always healthfully heated.

Greater Fuel Economy

Experience proves that the MINNEAPOLIS saves from one-fifth to one-third on fuel bills, no matter what kind of fuel is used. In view of the unstable condition of the coal and oil markets over a long period of years, you will appreciate the importance of the MINNEAPOLIS in reducing fuel bills. In a short space of time the MINNEAPOLIS pays for itself out of the savings it effects.

An Asset in Appearance

The Room Thermostat is pleasing in design and beautifully finished. No pains have been spared in its workmanship to make it attractive and suggestive of refinement. The Room Thermostat enhances the appearance of any well furnished room.

A Pioneer Product

The "MINNEAPOLIS" was the first automatic heat regulator to be operated by temperature changes only. Since 1885 it has constantly maintained its leadership through its efficiency and reliability. It is a precision instrument, scientifically constructed, extremely accurate, and because of its simplicity, thoroughly dependable. Its longevity is evidenced by the fact that many regulators are still in operation, after forty years of use.

It is a quality product that has earned the confidence of hundreds of thousands of home owners. In these homes it is regarded as an absolute necessity. It is a device that should be in your home. On the following pages, the applications to various forms of

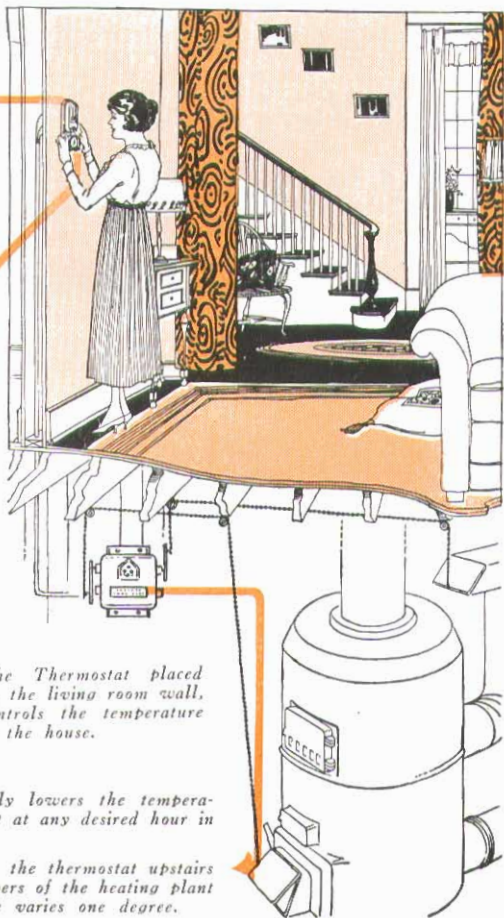
heating systems and the different types of instruments, are shown.



APPLICATIONS

To Coal Fired Boiler and Warm Air Furnaces

This diagram is an accurate presentation in picture form of the installation and convenient control of the Minneapolis Heat Regulator. Upon an inside wall at some convenient spot is located the thermostat which connects by a three way electric cable to the motor in the basement. The motor by means of chains running to the furnace dampers, absolutely controls the fire and the degree of warmth it generates. The action is entirely automatic once the thermostat has been set for the temperature desired.



The Thermostat placed on the living room wall, controls the temperature in the house.

The Clock automatically lowers the temperature at night and raises it at any desired hour in the morning.

The Motor operated by the thermostat upstairs opens and closes the dampers of the heating plant whenever the temperature varies one degree.

For Oil Burners

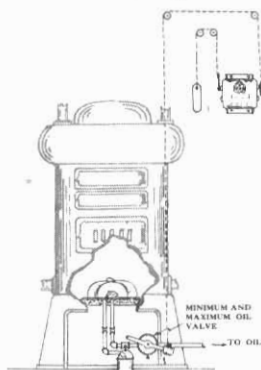


AUTOMATIC control is a necessity for the proper operation of the modern oil burning system. The Minneapolis Heat Regulator Company is the pioneer in the manufacture of temperature controlling devices for oil burners.

Co-operating with the oil burner manufacturers from their earliest development, MINNEAPOLIS engineers have constantly kept abreast of the progress made in the manufacture of oil burning equipment.

For Gravity or Natural Draft Burners

The gravity, or natural draft burner, is not usually sold by the manufacturer complete with automatic controls. Automatic control however, is just as essential on the gravity burner, as on the



power type. Most gravity oil burners are supplied with a maximum and minimum oil valve, which is controlled by means of a room thermostat and motor. This motor, instead of operating the drafts as on coal burning boilers, operates the maximum and minimum oil valve. When the room thermostat calls for more heat, the oil valve is opened to this maximum point. When enough heat has been generated, the motor turns off the oil valve, reducing the flame to a minimum point.

Oil cannot be economically or safely burned without automatic control.

A diagrammatic illustration of this type of installation is shown above.

Power Burners

On the power type of oil burner, the automatic control is usually furnished by the burner manufacturer as standard equipment. On

this type of burner, a MINNEAPOLIS room thermostat is used in connection with the MINNEAPOLIS Thermostatic Relay Switch, stopping and starting the blower motor.

MINNEAPOLIS automatic controlling devices are furnished as standard equipment by the leading manufacturers of oil burners. Before you definitely decide on any oil burner, ask if it is "MINNEAPOLIS" equipped.

Application to Gas Burning Heating Systems



THE "Minneapolis" takes entire charge of the gas heating plant, operating it on the highest efficiency basis. It automatically maintains a steady, even temperature all day, lowers temperature to economical night level and opens the valve at the hour you designate in the morning so the house is comfortably warm to dress in. The house is never too cold or too hot. Such home heating is an effective safeguard to health.

The "Minneapolis" is ideal with all gas heating plant installations. When the desired temperature is reached, the "Minneapolis" shuts off the entire gas supply, leaving only the pilot light burning to ignite the heater again when the temperature falls one degree below the desired mark. Thus overheating and all waste of gas is prevented. Tests show that the "Minneapolis" equipped gas heating plant gives complete heating comfort on one-fifth to one-third less gas than burned by the hand regulated heater. And with hand regulation real heating comfort is impossible.

The United States Government Bureau of Mines strongly recommends automatic control of gas furnaces in the "Natural Gas Manual for the Home." Under the heading, "Simple Ways of Saving Gas," the following advice is given: "Correct temperature should be maintained by aid of a heat regulator as keeping a house too hot is wasteful of gas and injurious to health."

The "Minneapolis" can be installed on either hot air, hot water, steam or vapor gas heating plants, either designed for the burning of gas, or equipped with detachable burners.

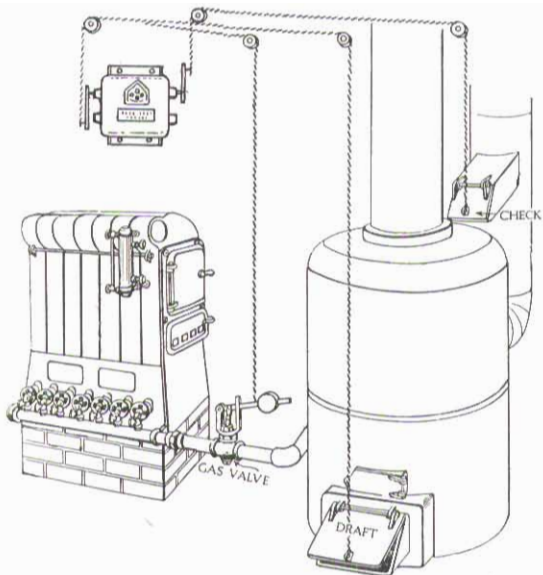


Diagram showing one Minneapolis Heat Regulator controlling tandem installation of coal and gas heater.

For Central Station Heating Steam or Hot Water



THE Minneapolis Thermostat is placed in some central location in the home or building and connected with a motor that is located in the basement or in whatever position is necessary to control the hot water or steam valve in the intake pipe. (As shown in the diagrammatic illustration on page 22.)

It will no longer be necessary for you to adjust valves in the basement or on the radiators—the “Minneapolis” will keep a constant watch over your temperature and usually saves you at least one-third on your heating bills.

The only sure way of saving condensation is by positive open and shut control of the valve at the street intake. Shutting off individual radiators only partly reduces condensation as the condensation occurs in the radiator supply pipes.

With the Minneapolis Heat Regulator installed and set for a normal temperature, the valve usually remains closed 60 per cent of the time—proving the waste of hand control.

The "Minneapolis" is the most easily installed, simplest and most effective automatic control apparatus for central heat—no delicate thermostatic valves, no special air pressure necessary, no diaphragms to replace or traps to clean. Underwriter approved. Can be easily attached to any type of central heat equipment. The only change required in the heating system is the installation of a quick opening valve furnished in various sizes according to the size of the supply line.

A central station in a middle western city supplying 300 users on a flat rate basis, has equipped each building served with a Minneapolis Heat Regulator. If it pays the central station sufficiently to warrant such an installation, from a standpoint of economy only, how can you afford to be without Minneapolis automatic control?

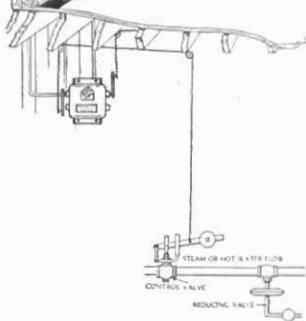


Diagram showing the installation of the Minneapolis Heat Regulator in a home using central station heat.

The Eight Day Thermostat

Model 77 Thermostat



THIS thermostat marks the latest development in automatic temperature controlling devices. The high-grade clock, an integral part of the thermostat, automatically lowers the temperature at the retiring hour, to any degree you desire, and again automatically raises the temperature an hour before rising time, to the normal day time degree. This automatic action is repeated daily morning and night, for eight days, with one winding.

In keeping with the surroundings of the finest homes, the Model 77 is furnished with a dull silver finish.

This thermostat is fully protected by patents covering its many important and exclusive features.

The Clock

The clock furnished with this model is manufactured in our new modern clock factory, and is the equal, if not superior to any clock of its type manufactured here or abroad. The movement is jeweled, with seven rubies and sapphires, with genuine bi-metallic expansion balance. The finest Breguet hair spring is used. It is adjusted to isochronism, as well as for heat and cold. All pinions and pivots are polished—every part is extra heavy, insuring rigidity to the movement, long life, and excellent time keeping qualities.

Model 55 Thermostat

This model is similar in operation to that described above, except that it is equipped with a plain non-jeweled clock movement, and is finished in a sand blast bronze.



*Actual size 2 1/4 inches
by 9 1/2 inches*

The One-Day Thermostat

Model 47



THE principle of operation of this thermostat is the same as the eight-day, except that the indicator must be lowered at night by hand, the clock wound, and in the morning the clock automatically raises the temperature to any point desired.

The thermostat is finished in sand blast bronze.

All MINNEAPOLIS thermostats are constructed entirely of brass and steel, finely finished, with the most accurate workmanship. The screen, attached without screws by our exclusive spring grip construction, can be easily and quickly removed. On the screen is mounted a Tycos Thermometer, with large, easily read graduations.

Thermostats can be set at any point from 50 to 90 degrees. Bakelite bushings insulate all the electric current from the thermostat, eliminating short circuits. The contact points are of large size, composed of platinum-iridium, assuring permanent, accurate adjustment, and long life.



Model 47

Model No. 40

Where the clock is not necessary or desired, the Model No. 40 may be used. This model is in appearance exactly similar to the Model 47, except that there is no clock attachment.

The Electric Motor



THIS model, new in appearance and design and greatly improved, is not built on a new and untried principle.

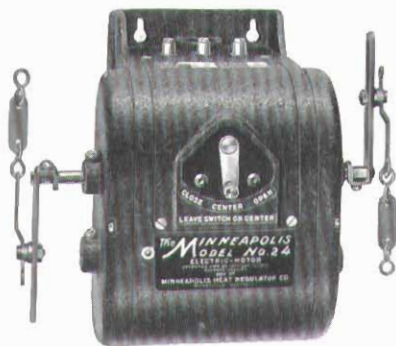
The basic principles of construction are the same as employed in the old type Electric Motor that have proven their reliability in years of actual use and dependable service.

The Electric Motor is connected directly to the house lighting circuit and never requires winding. The cost of operation will never exceed ten-cents per annum.

It is completely enclosed in a dust proof die cast aluminum housing, richly finished in baked enamel.

The motor itself is very powerful. Its lifting ability far exceeding any demands which dampers or valves would put upon it. A small transformer is used serving two purposes; first, preventing the motor from needlessly using valuable current when not in operation, and second, supplying a secondary low voltage circuit of only eight volts thru the thermostat, preventing injury to the platinum-iridium contacts.

The Minneapolis electric motor is absolutely safe. It has been tested and approved by the National Board of Fire Underwriters. The Electric non-wind motor is particularly recommended for use with gas, oil, or central station heating.



The Spring Motor



THE power on this type of motor is furnished by a heavy spring, giving the motor ample power to handle the average dampers or valves. One winding of the motor will handle the average heating plant burning coal from one to two weeks.

The cover is made of pressed steel, with black enamel finish. Sleaving at shaft openings protects the mechanism from dust and moisture.

The wind indicator shows when re-winding is necessary.

This motor is provided with patented automatic safety switch, so that in event of the motor running down, the heat will always be turned off on the last operation of the motor. The basement switch provides a means of operating the motor at will from the basement.



The Spring Motor

The Gravity Motor



Gravity Motor

The gravity motor is designed to be attached to the ceiling of the basement. The motive power is furnished by an iron weight of ample size to operate the average dampers. Wound by pulling up, once each day, chain to which the weight is attached.

The principle of operation is similar to the old-fashioned grandfather clock.

This motor is not recommended, due to the frequent necessity of winding, on gas, oil or district steam heat.

Dual Control



EXPERIENCE and research has proved that perfect regulation of hot water, steam, or vapor heating systems requires more than automatic control by the Room Thermostat, which is activated solely by the atmospheric temperature.

Often the forcing of a fire or oil burner to bring room temperature to a given point causes excessive heating of the water in the boiler, or dangerous raising of the steam pressure, due to the fact that water temperature or pressure rises faster than the radiators are able to transmit their heat to the air and raise the room temperature.

The Minneapolis Heat Regulator Company has solved the problem of eliminating these periods of fuel waste and possible danger through the use of its No. 65 Hydrostat or No. 70 Pressurestat in connection with the famous Minneapolis Room Thermostat. These two devices are unique instruments. They contain many exclusive features that make them incomparable with any other similar devices on the market.

They are used as standard equipment by many leading manufacturers of oil and gas heating systems and heartily endorsed by leading boiler makers.

The Hydrostat, operated in dual control with the Room Thermostat, gives the ideal control of a hot water heating system. It gives a double check; First, on room temperature by means of the Room Thermostat; Second, on the water temperature by means of the Hydrostat. In this case the Hydrostat operates as a limiting device, acting only in case of excessive heating.

Heat is often generated so quickly in the heating plant that the water becomes excessively hot some time before the room where the thermostat is installed has been warmed by the radiators. In this case much fuel may be wasted before the rising temperature operates the Room Thermostat and checks the fires.

For example, with the Room Thermostat set at 70 degrees and the

Hydrostat on the hot water heating plant set at 160 degrees, the heat is shut off when the room temperature reaches 70 degrees, regardless of the water temperature. And when, as in forcing fires in the morning, the water temperature reaches 160 degrees before the room temperature reaches 70 degrees, the Hydrostat assumes control, shutting off the heat so that not a bit of fuel is wasted.

With these two devices operating in dual control, the water is kept at the proper temperature without excess heating at any time during the process.

The hydrostat, in connection with the electric motor, is also extensively used for control of domestic hot water supply system in residences, apartments and hotels.



*The "Minneapolis" No. 65
Water Thermostat or
Hydrostat*

The "Minneapolis" No. 70 Pressurestat



*The "Minneapolis" No. 70
Pressurestat*

This device is used to maintain a uniform pressure in steam and vapor heating systems. It is operated by pressure as the Hydrostat is operated by water temperature. It can be set to maintain a specific pressure, such as three pounds, or to maintain a given range of pressure, such as from four ounces to one-half pound. The standard model has a range of from 0 to 10 pounds, but it can be furnished to range up to 125 pounds. It is also operated in dual control with the Room Thermostat. This is the ideal installation in connection with house heating plants, whether steam or vapor.

WHAT OWNERS SAY



THE proofs of the reliability of any product are the voluntary expressions of satisfaction from its users. We herewith reproduce excerpts from a few of the many thousand letters received from satisfied "MINNEAPOLIS" users.

A well known engineer says:

THE DAYTON ENGINEERING LABORATORIES CO.

Delco Ignition

"Enclosed, please find check in payment for the Minneapolis Regulator which you recently installed. I have been more or less disappointed in this regulator, because I can find nothing to complain of. It is really working out much better than I anticipated, and I am only sorry that I did not have it installed long ago."

W. A. CHRYST, *Chief Engineer.*

A saving on district steam:

"The writer, who owns a four-story business block at Hartford, installed your Minneapolis Heat Regulator six years ago. I can frankly state that the saving to me during those six years has paid for the regulator ten times over. Five hundred dollars would not purchase the regulator today if another could not be secured. The regulator operates a balanced four-inch steam valve connected to the Municipal City Heating Plant. The pressure at all times is high and the tenants previous to installing, would never turn the radiators off when rooms were overheated, but instead open windows; thus heating all outdoors. Now no windows are open and when 70 degrees Fahr. is reached the steam valve is automatically closed; also automatically cuts down to 50 degrees Fahr., during the night; restoring to 70 degrees at any time set in the morning. This night fuel saving alone would soon pay for the regulator. You are hereby authorized to furnish the latest Model Electric Motor Control Regulator for my new home, now under construction. I consider this purchase a necessity and money saving device, not a luxury. Yet there is a great satisfaction to me right now to know that both are combined at nominal charge. Service and economy are two great words in our modern day; having had that, I feel liberal to express myself as above to your company."

Successful with coke:

"I take pleasure in reporting favorably on the service obtained during the past winter from the Minneapolis Heat Regulator in connection with the hot water heating system in my residence in Webster Groves.

The fuel used was Laclede Gas Coke and at no time did the fire go out unless due entirely to carelessness in attending to the furnace.

The regulator has, at all times, operated perfectly, and has required no attention except the periodical winding of the clock and motor. The freedom from watching and attending to the draft makes the regulator well worth its cost, and I believe this cost will be saved many times over in the saving of fuel."



36 years of faithful service:

"Our regulator was installed about 1888. It has been in constant use since its installation. I don't recall any outlay for repairs. It is still in good condition and giving satisfactory service at the present time (April, 1924), and has been a source of comfort and economy always."

A New York City user says:

"For three years, my father has been using a Minneapolis Heat Regulator on conjunction with his steam heating system in his home. The results were absolutely wonderful but I thought they were influenced by the use of gas as fuel in his furnace.

This year I attached a Minneapolis Regulator to my hot air furnace, and I am compelled to voluntarily write this recommendation because of my enthusiasm. Despite the poor coal we have to use the results are just as good as those my father obtained, and I could not think of being without it. The householder who continues to attempt to heat his home without a 'Minneapolis' is living in the 'Dark Ages'.

This makes four 'Minneapolis' in use in our family."

Takes the sting out of winter in St. Louis:

"After having used the heat regulator for two seasons, I feel that I should tell you how thankful both Mrs. Meier and I are that you persuaded me to install it.

We regret that we did not put it in long ago, for it has certainly taken much of the sting out of caring for the boiler.

As you know, I have suggested to three of my friends that they install a 'Minneapolis,' and each of them seems just as enthusiastic over it as we are."

A Philadelphia fan sells his friends:

It costs so little, its convenience is so great and its accuracy so dependable—well, I have told so many friends about it that they have begun to "kid" me about being on your payroll.

At any rate, my friends to whom I "sold" your regulator are all thankful and some of them have "resold" to their friends. I would not want to be without a similar device."

A Buffalo user on coal and gas, writes:

"The Minneapolis Heat Regulator regulates the temperature in the house to perfection, practically within a quarter of one degree, and we are more than pleased with same and are deriving a great deal of comfort from it, besides finding it a considerable saver of fuel. We find it works equally as well with coal as with gas."

The most useful device in home:

"The Minneapolis Heat Regulator you installed in our new house at Kensington is doing its work admirably, and I unhesitatingly recommend it because it saves more labor and gives more comfort than any other piece of mechanism round the house and with practically no attention."



A St. Louis user writes:

"No doubt you will be surprised to receive this letter, but in view of the fact that I am so well pleased with my Minneapolis Heat Regulator, I feel that I owe you this unsolicited letter.

After using this regulator for the past six months, I will say that it is more than you claim for it. Words cannot express the comfort and convenience it has added to my home. I find it a saver of fuel and keeps the heat at a uniform temperature, and is a better watch for our furnace than a janitor."

A Philadelphia doctor says:

"Enclosed find check for the last motor installed for the steam valves. All your motors and thermostats are working perfectly, and I want to thank you and the Minneapolis Company for the prompt and courteous treatment accorded me.

In my opinion, the Minneapolis Heat Regulator is more essentially a part of a well regulated heating plant than the fireman."

A Milwaukee man says:

"Last November I installed one of your Minneapolis Heat Regulators in my residence, and it has given me perfect satisfaction. The furnace was a sort of a nuisance to the family heretofore, but since the installation of the regulator, everyone forgets the furnace and the house is always comfortable day and night, with attention only in the evening, before going to bed. I wouldn't take a thousand dollars for this regulator if I couldn't get another one; I heartily recommend it to anyone."

A heating contractor's views:

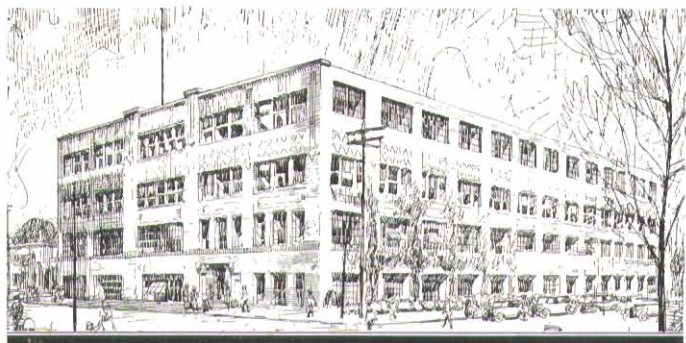
"We install hot water, vapor, and steam heating systems, and earnestly recommend Mpls. Heat Regulators in connection with all our plants, because we know that regulators materially aid in the operation of the plants. As stated above, we are very anxious to have regulators installed in connection with our plants, not on account of the profit which we make on the regulator but because they help to make the plants more complete."

A Cleveland user on coal, gas, and oil:

"The fact that I have had one of your instruments in my home for the last sixteen years indicates quite readily that I am more than satisfied with your equipment.

I have used the regulator not only with gas and coal, but today am operating my oil furnace by it and find it most satisfactory in every respect."





THE MINNEAPOLIS HEAT REGULATOR

THE MINNEAPOLIS HEAT REGULATOR is not assembled. Every part is made in our large modern fireproof factory. Our skilled craftsmen are experts in the manufacturing of Heat Regulators—because their attention and skill are not divided by the manufacturing of any other article—our entire organization being devoted solely to producing the highest grade temperature regulating devices made. Every item, from the raw material to the finished product, is subject to the most grueling tests and careful inspection before it leaves our factory.

Minneapolis Heat Regulator Co.

Established 1885

Executive Offices and Factory, Minneapolis, Minn.

BRANCH OFFICES:

NEW YORK CITY
MILWAUKEE

CHICAGO
ST. PAUL

PHILADELPHIA
CLEVELAND

BALTIMORE
BOSTON
BUFFALO

CINCINNATI
DENVER
DETROIT

KANSAS CITY
OMAHA
PORTLAND, ORE.

PITTSBURGH
SEATTLE
ST. LOUIS

SYRACUSE

*And 20,000 Heating Dealers throughout the
United States and Canada*