Romance of Air

AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

40 West 40th Street, New York, N. Y.

Romance of Air

IN all the world there is just one thing that no one can do without for even a few minutes; and that is AIR.

Had we to pay for the air we breathe, it would command a higher price than the food we eat; for a man can go for days, even for months without food and for many hours without water, but if he is deprived of air, death becomes a matter of but a few minutes.

Have you ever considered just what the daily menu of the average man is? Here it is—

3 lbs. food
4 lbs. water
34 lbs. air

Could we but see the air we breathe and note its quality, then indeed would we give it proper due. But air is colorless, and no visual differences appear between good air and bad to warn us. Often when we become grouchy and irritable, and our mental processes slow up, the reason may go no further than the air in the room we occupy, although many of us are prone to blame it on our food and seek new diets.

AIR is a subject, truly, that deserves the serious thought of every man and woman, boy and girl, who wants to enjoy good health to the utmost—and that, of course, means every one. On the air we breathe depends the way we look and think and feel and work and play. On it depends to a large extent our span of life.

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Fortunately, during comparatively recent years, scientists and engineers have delved into this subject from every angle and have developed principles and facts about air in its relation to health and comfort, that may rightly be said to constitute a new science—the science of Air Conditioning. The story is a fascinating one, and while many people are already familiar with the term "Air Conditioning," few really understand what it means. To explain it so that one does not have to be a technician to understand it, is the purpose of this book, which we gladly dedicate to the better health and greater happiness of every reader.

THERE was a time, we are told, when the life of the human race was confined almost entirely to the warm country near its birthplace in the fertile valley lying between the Tigris and the Euphrates Rivers. For in that part of the world Nature provided warmth and moisture—so balanced as to best sustain life. But when man learned the art of making a fire, he could migrate northward and settle down in colder countries, because he could warm the air in his place of shelter. That was the first great step in Air Conditioning. Through the centuries the art of heat control was developed until today there is hardly a place where men cannot settle if they wish and live in comfort in their homes.

Why is it that heat is so important to human life?

The answer is that our bodies depend upon heat for the energy required for our every action. They are, in fact, just like heat machines. To a furnace you feed fuel and air, in return for which it delivers heat and by-products, ashes, carbon dioxide, etc. To the human body we give food and air, and from these the body manufactures its own heat in a most marvelous manner.

Into our lungs we draw air from the atmosphere about us. Passing through the nasal passages, the air is warmed and partially robbed of dust and bacteria by the hairs and the mucous on the membrane linings of the passage-ways. In the lungs, the oxygen of the air passes through the delicate cell walls and enters the blood. The red corpuscles in the blood receive the oxygen and carry it on throughout the entire body. As the stomach receives food, the red corpuscles bearing the oxygen hasten to the vicinity of the

stomach and intestines, and the food is oxidized, giving up heat in the process. Part of the food is used to build up the cells of the body and the rest is eliminated as waste. Carbon dioxide, CO_2, is formed as a result of the combustion, and the blood carries this gas back to the lungs from where it is exhaled into the air.

About 21% of the air in our atmosphere is oxygen. About 78% is nitrogen and only .04% is carbon dioxide. Yet the air exhaled from the lungs contains about 17% of oxygen and about 4% of carbon dioxide. Thus in doing its work in the body, the air loses about 4% of oxygen, while the carbon dioxide content is increased one-hundred-fold. We shall later see the significance of this in discussing ventilation.

Thus does the body produce the heat energy that keeps it alive and moving. Naturally, the more rapidly it works, as in running, swimming or other form of exercise, the more heat is required. We breathe faster, more oxygen is taken in, the entire process of oxidation is speeded up and the required heat energy is produced to meet the extra demands of the body. So it is that even on bitter cold days people can remain outdoors all day long, provided they are warmly clothed and keep their bodies moving, but when they are at rest indoors it is a different matter. Then, *artificial heat must be had* to prevent the body from losing its heat more rapidly than its internal combustion will supply it.

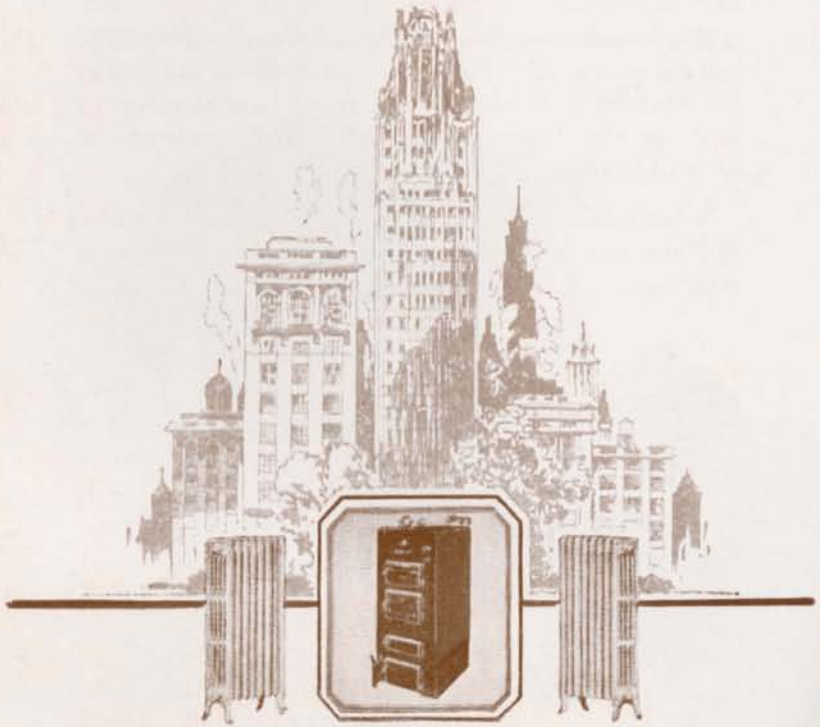
Good health requires a body temperature of 98.6° F. and marvelous indeed is the manner in which Nature has provided the body with an automatic heat regulator to maintain this temperature. We call this regulator the nervous system.

When it happens that the body temperature rises above 98.6° the nervous system opens the blood channels in the skin, more blood flows to the surface of the body, perspiration starts and the excess heat passes into the air by evaporation, convection and radiation. We shall see a little later how the moisture content of the air controls the process of evaporation and thus affects our health and comfort.

Conversely, when the body temperature starts to go below 98.6° the nervous system causes the blood channels in the skin to contract and the warm blood

moves less rapidly from the deeper, internal parts of the body where the heat must be maintained to support life. If there were no heat in our homes during the winter months we could not survive in cold climates for the heat loss from our bodies to the cold air would be too great.

And so it is that HEAT—artificial heat during the cold seasons—is the first requisite for mankind in order to live in northern countries. Without HEAT our great towering cities and our entire present day civilization in America and Europe would be impossible.



HUMIDIFICATION

EVERY doctor knows that colds, bronchitis, influenza, grippe and respiratory diseases in general are far more prevalent during the winter months. Every year there are millions of people who normally enjoy good health in warm weather, but suffer from colds and other troubles of the nose and lungs almost as soon as cold weather comes.

Why is this? Is there any connection between this phenomenon and our heating? To understand the condition we must first know something about what is called DRY AIR.

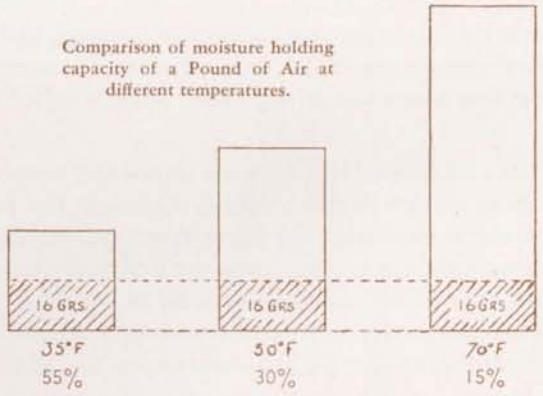
We have all noticed that on some days water evaporates much more quickly than on others. Although few people can tell the reason why, we know from experience that there are good days and bad days for drying clothes, and also that a breeze in the air helps greatly in the drying process. There are days, too, when the air is so quiet and laden with vapor that the drying process is almost at a standstill.

The fact is that the amount of moisture any given volume of air can hold depends upon its temperature. The lower its temperature the less moisture it will hold; while conversely, the higher you raise its temperature the more you increase its moisture-holding capacity. The amount of moisture in a volume of air at a given temperature, compared with the amount of moisture that the air can hold *at that temperature*, is the relative humidity of that air.

For example, a volume of air that is saturated with moisture, i. e., contains all the moisture it can possibly hold—has a relative humidity of 100%. Air that has half as much moisture as it can hold has a relative humidity of 50%, etc.

Therefore, when cold outside air is taken into our homes during the winter months and heated *without having any moisture added to it,* its relative humidity decreases, or, as we say, it becomes dry.

Assume 35° F. air from out of doors with a relative humidity of, let us say, 55%, being warmed to 70° F. when introduced into a building. If no additional moisture is added to it, its relative humidity becomes about 15%!

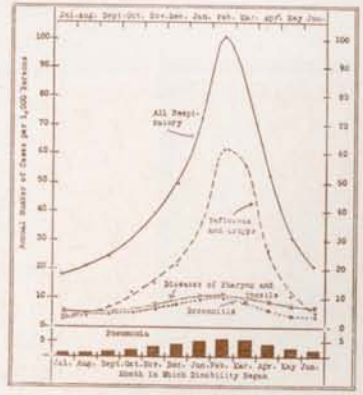


Comparison of moisture holding capacity of a Pound of Air at different temperatures.

Now, the relative humidity on even the driest desert is approximately 20%, and we know how impossible it is for plant or animal life to develop in the desert. There, only a few such plants as the cactus have been able to survive. Healthful growth in the animal or plant kingdoms demands first, adequate warmth and second, adequate moisture.

Heated air, therefore, becomes dry air unless moisture is added during the process of heating; and hot, dry air is capable of absorbing and holding far more moisture than cold air. Dry air has, in fact, a tremendous affinity for moisture. It takes moisture wherever it can find it and it finds it, among other places, on the mucous membranes that line the nose and throat.

Now it is the function of this mucous to moisten the air before it passes into the lungs, and with the hairs of the nose, to catch hold of germs that are drawn in as we breathe, so that they do not infect the cells of the membranes themselves. But when the hot, dry air that we breathe absorbs the moisture from the mucous, it decreases the power of the mucous to perform this function. Then the bacteria, in the always bacteria-laden air which we breathe 17 times every minute, have an easy job in infecting the cells and so causing one or another of the respiratory diseases behind whose doors lurk many more deadly enemies.



U. S. Health Service Chart showing increase of respiratory diseases during heating season.

And so, to heat the air in our dwelling places during cold weather still remains the first and basic requisite; but because heated air becomes dry air by the law of nature, unless moisture is artificially added to it, and because dry air is accompanied by the undesirable conditions

referred to, our second problem in air conditioning is therefore to furnish proper humidification.

In passing, let us note also what hot, dry air in our homes or offices will do to the things about us. Because of its affinity for moisture, dry air extracts moisture from wood, causing it to shrink and check . . . furniture comes apart, floors creak, doors warp and cease to fit. Pianos get out of tune, oil paintings crack, veneer surfaces contract and peel, book bindings split, fibres of thread become brittle, rugs and draperies wear out prematurely, house plants wither and die.

You can easily determine the relative humidity in a room by means of a very simple instrument called the Hygrometer. It consists essentially of two thermometers set upon two similar temperature scales. Attached to the bulb of one is a piece of cloth or wick which extends into a small receptacle containing water. This thermometer is called a wet bulb thermometer because water is rising in the cloth and moistening the bulb. As evaporation always takes away heat, the temperature of the wet bulb thermometer is lower than that of the dry bulb thermometer. The drier the air is in the room,

the more rapidly will evaporation take place from the wick around the wet bulb and the lower will be the wet bulb thermometer reading. Charts have been worked out from which, using the readings of the dry and wet bulb thermometers, the relative humidity of the air is quickly and easily determined.

VENTILATION

LINKED inseparably with heating and humidification is the need for ventilation, most particularly in schools, churches, theatres, auditoriums and wherever large groups of people assemble. Up to the middle of the 18th century very little was known about ventilation.

It was in the summer of 1758 that a tragedy occurred that stirred the civilized world and directed intense study to the subject of ventilation. This was the tragedy of the Black Hole of Calcutta. The Black Hole was in fact a room 18 x 20 ft. with a low ceiling, one door and two small windows. In this room an English garrison of 146 men was imprisoned about 6 o'clock one June evening, a time of the year when the temperature and humidity in Calcutta, a tropical city, is exceedingly high. It is recorded that about 9 o'clock in the evening the distress of the occupants became very great. They suffered intensely and cried out for water. Many sank to the floor in a dying condition, and when morning dawned 23 men only, out of 146, were found to be alive.

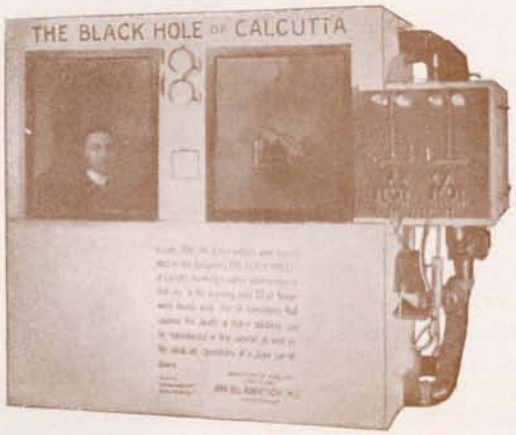
For a long time it was held that carbon dioxide was the principal source of air contamination. While on the sur-

face this appeared to be a logical conclusion from all the facts observed, leaders in scientific thought soon began to appreciate the really harmless nature of carbon dioxide and looked upon it rather as a diluting substance in the air which prevented the proper assimilation of oxygen.

In 1842 the French scientist LeBlanc confined animals in an atmosphere containing as high as 300 parts of CO_2 per 10,000 parts of air. This was many times the amount generally supposed would produce death, yet LeBlanc reported that his animals showed no ill effects. He believed that the ill effects in poorly ventilated rooms were due to some other cause than carbon dioxide.

Still no exact method had been established and accepted for measuring the exact degree of carbon dioxide in places of human occupancy. This was the first great contribution of the scientist Max von Pettenkofer.

With the help of his method, Pettenkofer investigated the proportions of carbon dioxide given off in inhabited



Courtesy of Aerologist Publishing Company

rooms by persons at rest and at work, by gas flames, etc., and the efficiency of various methods of ventilation. Pettenkofer recognized the fact that CO_2 was, in itself, not injurious under conditions of bad ventilation. He believed, however, that normal people did exhale a poisonous substance which he could not identify, and suggested the use of CO_2 in the air simply as a convenient index of the air contamination which in his opinion was actually due to the other exhaled poisonous substances; for he observed that in crowded rooms the odors that he ascribed as due to the real poisonous substances, always increased with the increase of CO_2.

Then the theory of "crowd poison" arose. It referred to the poisonous substance or substances that were supposed to exist in crowded places, and the theory found acceptance up to practically the beginning of the 20th century.

In 1905 began the series of experiments in the Flügge laboratory, at the Institute of Hygiene at Breslau, that marked the beginning of an entirely new conception—our modern conception regarding ventilation. In these experiments human beings were confined in an air-tight cabinet for hours at a time, breathing air in which the CO_2 and other products of respiration reached what had been previously considered alarmingly dangerous proportions. The subjects however experienced no harmful effects and felt no discomfort, *provided the temperature and humidity of the air were not allowed to increase above a certain point!* If the temperature and humidity did increase beyond a certain point the discomfort was considerably relieved by increasing the air motion about the students' bodies.

It was brought out that the distress caused by confinement in poorly ventilated and crowded places was due to

high temperature or high humidity or a combination of the two, and *to lack of air motion.*

Thus temperature, humidity and air motion are fundamentals in Air Conditioning and they must be duly balanced and controlled for human comfort.

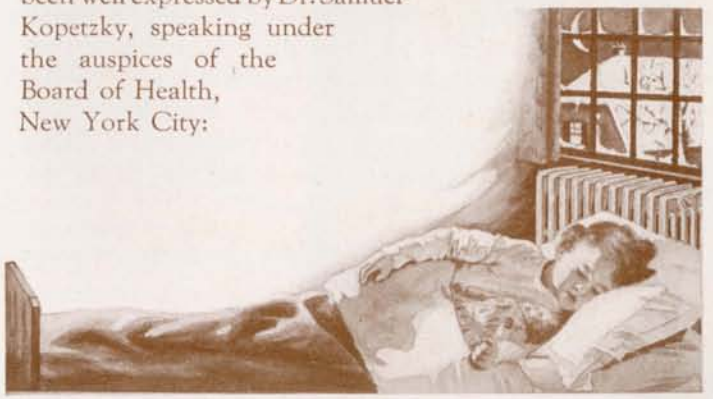
Flügge's experiments have since been checked and rechecked by scientists and engineers in America, England and other parts of the world and his conclusions confirmed in every case.

AIR CLEANING

"IF I had a drug known only to myself" said Major Edward J. Abbott, M.D., speaking under the auspices of the New York City Health Department, "that would surely lengthen life by five or ten years and were to advertise it for sale, I would be swamped by applications for it and I would become rich beyond the dreams of avarice. Yet my next words will reveal the secret of lengthening human life and I neither expect fame nor fortune from my utterance. Listen and you will catch the fateful words. Keep from catching cold and your life will be at least five years longer."

And this holds particularly true for people living in cities. Here, with the tearing down of old houses and the building of skyscrapers, the pouring out of smoke and grime from the chimney tops, the traffic and the congestion in the streets, the sources of air contamination are steadily increasing and dust and bacteria—contributing causes of colds—are everywhere present in the air.

How serious and how prevalent is the common cold has been well expressed by Dr. Samuel Kopetzky, speaking under the auspices of the Board of Health, New York City:



"Dollars and cents are so much under discussion today that perhaps I can make you understand the importance of preventing colds when I tell you that this common ailment produces a greater economic loss every year than any other disease. More working days are lost because of colds than any other ailment. The financial loss resulting from this runs into millions of dollars annually.

"There is a more important reason, though, for trying to prevent colds. You all know how miserable a cold makes you feel while it lasts. In addition it may be the forerunner of sinus trouble, influenza, pneumonia and other serious conditions. It is one of the common causes of ear diseases and if recurring frequently may be an important factor in producing deafness."

What is the cause of colds and how can proper air conditioning help one to avoid them?

It is generally conceded that germs are the direct cause of colds, and that if there were no "cold" germs we should have no colds. For example, the people of

Labrador, deprived through the long winter months of certain vital food necessities, to the point that they suffer from serious nutritional ailments, nevertheless do not have colds during the winter months when they are isolated from the rest of the world. But when the ships come into the harbors in May, bringing outside visitors with their full quota of cold germs, colds sweep through the communities of Labrador.

We must bear in mind, however, that nature has provided the normal human body with the means of resisting these germs and it is only when our resistance breaks down that the germs actually infect the mucous membranes of the respiratory tract and cause the disease.

We have seen that prolonged exposure to overheated, dry air is the greatest single cause of making the mucous membranes susceptible to the attack of germs and that, therefore, the proper heating and humidification of air during the winter months is essential in preventing colds. Now *CLEANING THE AIR* must be added as an additional and highly important contributing factor in safeguarding our health by keeping the air in our dwelling places as free as possible from contaminating germs and other irritating substances.

In most Air Conditioning units the factor of Air Cleaning is accomplished by circulating the air through filters which remove as high as 97% of the dust.

During the summer months Air Cleaning assumes a particularly important role for those who suffer from Hay Fever. This most troublesome and painful malady is caused by the irritation of the delicate membranes of the nose and throat. Many Hay Fever sufferers who spend eight or ten hours in pollen-free air find that their resistance has been so raised that they can spend the rest of the day, if necessary, breathing pollen-laden air, without discomfort.

Let us summarize:

1. Colds are directly caused by disease germs.

2. These cold germs are carried in the noses and throats of many well persons, but do no damage until the physical resistance is lowered.

3. When the physical resistance is lowered, the mucous membranes of the nose and throat become dry and germs already present are able to make inroads and cause infection.

4. The common causes of the lowered resistance are prolonged periods spent in stuffy, overheated rooms where the mucous membranes become dry and susceptible to the cold germs, or chilling of the body resulting in going from an overheated room into the outside air.

5. To avoid colds we should—

   1.—Keep the air properly heated, humidified and cleaned, and provide for a constant supply of fresh outside air through proper ventilation.

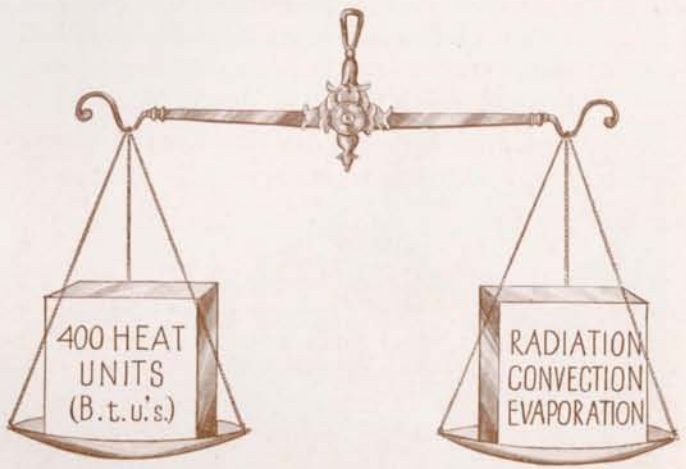
   2.—Avoid close contact with people who have colds when they sneeze or blow their nose. Everyone with a cold should cover up each cough and sneeze and should use preferably, paper handkerchiefs which should be destroyed.

   3.—Keep in good physical condition by eating proper food and having plenty of sleep.

COOLING AND DEHUMIDIFICATION

WE come now to the very interesting subject of conditioning the air in our homes and places of business during the hot spells of summer in order to keep them cool and comfortable. In the winter time, as we have seen, our problem is to heat the air and add moisture to it in order to prevent an excessive heat loss from the body and thus permit it comfortably to maintain its normal temperature of 98.6° F. But in the summer time we must condition the air to permit the body more readily to give off the excess heat it generates in such a manner as to make possible a maximum degree of comfort.

And so the natural question arises as to how many ways there are in which the body can get rid of its heat. There are just three ways: First, by the process known as



Radiation; second, by Convection; and third, by Evaporation. The good air conditioning engineer takes into consideration all three methods in planning for summer comfort, with a due regard to local climatic conditions; for all three must be carefully balanced in order to avoid sensations of bodily shock caused by sudden changes between outdoor and indoor air conditions, and to provide the most desirable conditions for human comfort.

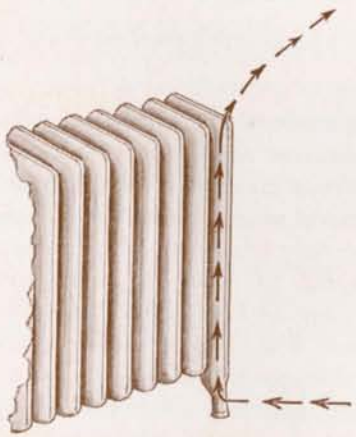
On the opposite page is a scale which pictures the whole problem very simply:

The 400 heat units shown on the left hand side of the scale represent the excess heat which the average man under normal conditions must give off each hour in order to maintain his normal blood temperature of 98.6° F. and feel comfortable. On the right hand side of the scale are the three methods by which the heat can be removed. Obviously, the total amount of heat given off by these three methods must equal 400 units if the scale is to balance. An increase or decrease in the amount given off by any one method must inevitably affect the amounts removed by the remaining two methods, if balance is to be maintained. Let us consider each method.

The first method is by Radiation—familiar to every one as the method by which the sun radiates its energy into space and heats the earth. When any object is hotter than its surroundings it gives off some of its heat by Radiation. For example, a good part of the heat from a radiator is transmitted by radiation, and the furniture and other articles in the room become sensibly warm. So, too, the human body radiates heat when its temperature is higher than that of its surroundings, and the amount so given off depends, among other things, upon the difference in temperature.

Therefore, by artificially lowering the temperature in a room during the summer, we can increase the amount of heat given off by the body through *Radiation*.

Our second method of heat transfer is Convection, which is easily understood by referring again to the illustration of a radiator.



As the envelope of air immediately surrounding a radiator becomes warm by direct contact with the heated surface of the radiator, it becomes lighter in weight than the air about it, and in accordance with the law of gravity, it rises and cooler air flows in to take its place. The process becomes continuous and a steady circulation is set up, the air literally "wiping" against the radiator's surface, taking up heat by contact and carrying it to every nook and corner of the room. This method of heat transfer is spoken of as convection. Now should a fan, for example, be so placed as to make the air circulate with greater rapidity over the radiator, the "wiping" effect would naturally be increased and more heat would be removed in a given time.

Just as in the case of a radiator, the human body sets up its own natural circulation of air and some of its heat will be given off in the manner outlined, provided, of course, that the temperature of the surrounding air is

lower than that of the body. Now, if we supply a mechanical air movement, it is apparent that the heat taken away from the body may be increased or decreased by changing the speed of the air circulation together with an increase or decrease of the temperature of the room air. Comfort, therefore, depends upon a proper simultaneous control of both the mechanical air movement and air temperature, and also upon our third method of heat transfer—Evaporation.

Evaporation is a particularly important practical factor in air conditioning for summer comfort.

We have all noticed that on certain hot summer evenings when we sprinkle the lawn and walks they dry up rapidly and cool the air delightfully. On other summer evenings we could sprinkle as much as we pleased without feeling cooler . . . In the first instance the air was comparatively dry and, as we have seen, the drier the air the greater its capacity for moisture. It quickly evaporates

the water and the process of evaporation is always accompanied by heat absorption. That is the fundamental to be kept in mind in discussing this phase of air conditioning because, by regulating the amount of moisture in the air, we control the rate of the evaporation of the body's perspiration and consequently its heat loss by this method.

You can see by a very interesting little experiment how heat is transferred by evaporation and how therefore evaporation means cooling. If you place a thin watch crystal on a drop of water on a piece of cork, then place some ether on the glass and blow on it through a tube, you will notice that the water freezes to the glass.

The explanation is very simple. To evaporate the ether, heat is required, some of which is provided by the water. The rate of evaporation is so rapid, due to the volatile quality of the ether, that the drop of water is quickly lowered to its freezing point.

This is the principle also of the iceless ice box so commonly used by the natives of many tropical countries to keep their food and water cool. The cooler is made of a very porous material which is dipped in water for a few minutes each day and kept, as far as possible, in a breeze. As the water evaporates from the pores of the container, heat is needed for the process, and it is taken from the food products.

In air conditioning, when it is desirable to reduce the moisture content of the air in order to increase evaporation, the air must be de-humidified. As Humidification means *adding* moisture to the air, so Dehumidification means taking moisture from it. If moisture is not removed there is no Dehumidification.

The dehumidification of the air may be accomplished by passing the air over a surface chilled by either cold water or mechanical refrigeration, or by passing the air thru sprays of cold water. When the air is cooled below its dew-point by any method, not only is its temperature reduced, but it is dehumidified as well.

Dehumidification may also be achieved by means of chemicals which possess a high affinity for moisture.

It is plain, therefore, that the matter of cooling the air for summer comfort must be treated scientifically with a proper consideration and coordination of the three elements by which the heat created in the body is removed:

1. Radiation, requiring control of the indoor temperature.
2. Convection, involving control of the indoor air motion as well as temperature.
3. Evaporation, involving control of the indoor air humidity, and air motion.

Each factor is subject to control, but each taken by itself has its limitations. It is the judicious combination of the three that results in the perfect Zone of Human Comfort.

CONCLUSION

IN this little story of air we have seen that there are six fundamental elements involved in complete air conditioning, namely:

Heating . . . Humidifying . . . Ventilating

Air Cleaning . . . Air Cooling . . . Dehumidifying

To these, the element of Noise Elimination is frequently added.

Some units manufactured are designed to accomplish one, or more than one, of these elements, while others accomplish them all.

The most comprehensive and advanced line of tried and proved Air Conditioning products on the market today is made by the subsidiary companies of the American Radiator & Standard Sanitary Corporation. These products are designed to fulfill any or all of the fundamental factors according to individual requirements. Each product is backed by more than forty years of experience in this general field.

We shall be very glad to give full particulars about these products to any reader and, if desired, free authoritative advice for the proper solution of any Air Conditioning problem.

Address—

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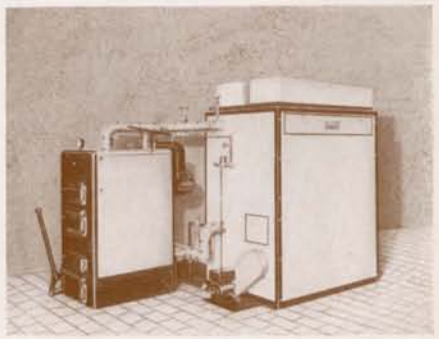
TYPICAL AIR CONDITIONING PRODUCTS OF SUBSIDIARY COMPANIES OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

Meeting the Requirements of Single Rooms to Large Office Buildings

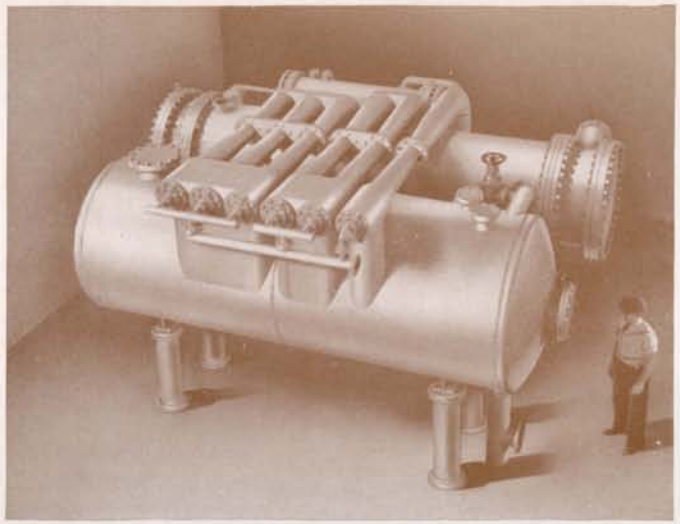
Series "O" Sirocco Air Conditioner

Series "O" Sirocco Air Conditioner is designed for single rooms, stores, offices, etc. It cools the air in summer, and warms it in winter, giving year round temperature control. Easily installed and can be taken along if one moves. Product of American Blower Corp.

Series "R" is a centrally installed unit for homes and small buildings. It heats, ventilates and humidifies in winter. During the summer it cools, dehumidifies and circulates the air, while throughout the year the air is thoroughly cleansed of dust and dirt. Product of American Blower Corp.



Series "R" Sirocco Air Conditioner



Ross Decalorator

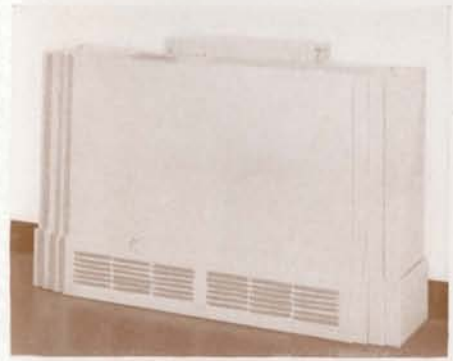
The Ross Decalorator is a steam jet refrigerating machine that utilizes the principle of high vacuum to produce cold water. The chilled water is delivered to a heat exchanger over which the air is circulated and thus cooled. There are no moving parts. For large or small air conditioning installations. Sold by American Blower Corp.

Arco Humidifier "A" is attached to either a steam or hot water radiator. It costs but a few dollars and will humidify one or two rooms depending on size. Product of American Radiator Company.

Arco Humidifier "A" Attached to Radiator

Model "A" Maxim-Campbell Silencer and Air Filter

Model "A" Maxim-Campbell Silencer and Air Filter—fits neatly right on the window sill, keeps out noise, cleanses the air and ventilates the room. Product of Campbell Metal Window Corp.

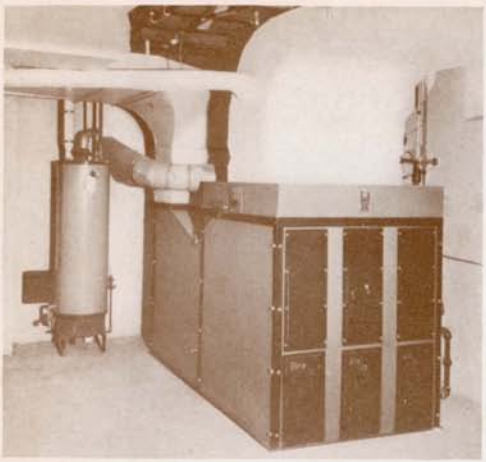


Model "C" Campbell Room Unit Air Conditioner

Model "C" Campbell Room Unit Air Conditioner accomplishes all seven elements of air conditioning: Heating, humidification, ventilation, air cleaning, cooling, dehumidification, noise elimination. Product of Campbell Metal Window Corp.

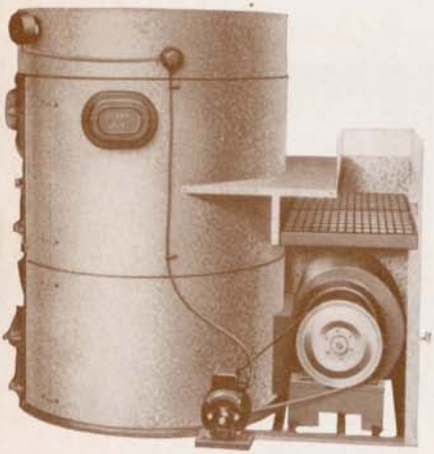
Model "J" Campbell Room Unit

Model "J" is a self-contained portable unit especially designed for summer cooling and dehumidification. Mounted on ball-bearing, rubber tired casters, it can be moved from room to room. Product of Campbell Metal Window Corp.

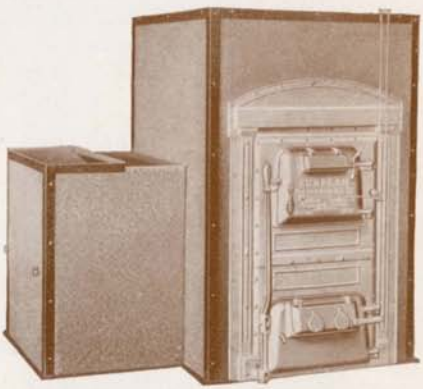


Sunbeam Gas Automatic Air Conditioning System

The Sunbeam Gas Automatic System is a complete air conditioning unit installed in the basement. It provides winter warmth, humidification, ventilation, and equipment for summer cooling and dehumidification can easily be added. It cleanses the air as a year round function.



No. 10 Sunbeam Air Conditioning Unit
Burning Coal



No. 60 Sunbeam Air Conditioning Unit
Burning Coal or Oil

Sunbeam No. 10 and No. 60 Air Conditioning units, placed in basement, provide heating, humidification, air cleaning, and air circulation. Equipment for summer cooling and dehumidifying can be supplied on order.