



Ideal Heating Journal

Devoted to the advancement of the
Steam & Hot Water Heating Industry

VOLUME 1

NUMBER 8



Sixteen Sky-Scrapers and Big Buildings, Seattle, Washington

Heated with AMERICAN Radiators

This view illustrates the wonderful growth of a vigorous Western City in America. Seven years ago the ground on which these buildings stand (bordering on Puget Sound) was a cow-pasture

Contents for November

	PAGE		PAGE
Advertising that pays as you go	11	Regitherms for drying paints, varnish, etc.	15
Increasing mid-winter work and profits	8	Safety valve, the first	14
In praise of steam heat	10	Sylphon tank regulator with spring	4
Heating a sea-going pleasure boat	13	Tank regulator in actual practice	7
Heating economy <i>vs.</i> power waste	12	Vacuum cleaning, a special installation of	11
Pipes, space occupied by condensation in return	3	Vacuum cleaning, character of orifice important	6
Radiators, method of testing	1	Vacuum cleaner pump, Govt. expresses preference	13
Recleaning the cleaned rugs	4	Vento, a model installation	16

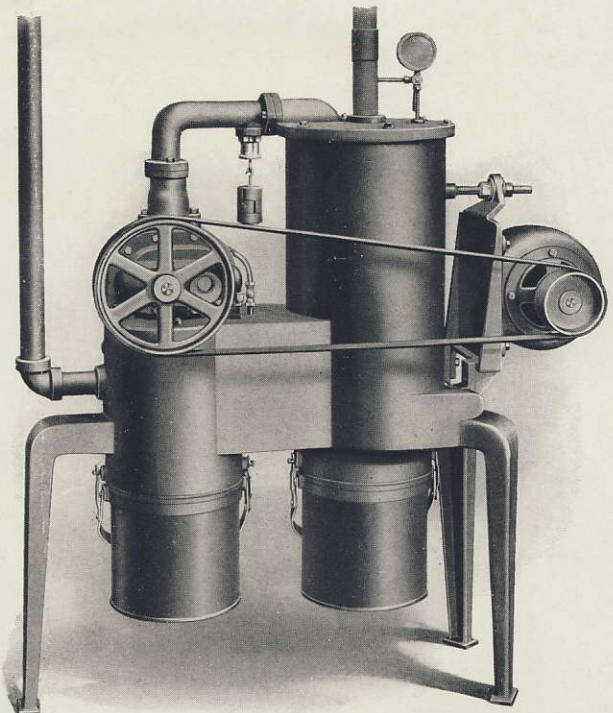
A Successful Vacuum Cleaner

SUCTION air-cleaning is here to stay. It is the "fifth wheel" in the business vehicle of modern home equipment. It comes along naturally with heating and plumbing. Mechanical cleaning is really one of the prime needs of first-class private and public properties. The need is enormous—an endless demand—knows no season. To every contractor who has established a good-will in trade, with money invested in tools and equipment, large opportunities exist for increase of profitable business through the sale of

ARCO WAND VACUUM CLEANER

Every fair-size community has well-to-do folks who can afford a built-in cleaner—need one badly, waiting for your solicitation. Besides, what they save on the cleaning pay-roll at hotels, schools, theaters, clubs, stores, garages, etc., makes the ARCO WAND Cleaner a worthy proposition. They are simple to install (no questions of correct piping, capacity, draft, fuel, etc., to be decided as in heating), quiet and easy running, powerful, durable; each and every one of the hundreds we have sold *are giving satisfaction.*

Send us an inquiry and permit us to show you some special methods for the sale of ARCO WAND Vacuum Cleaners in connection with your regular business, and with good profit and satisfaction.



ARCO WAND Vacuum Cleaner—rear view

AMERICAN RADIATOR COMPANY

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Method of Testing Radiators

As applied at the Institute of Thermal Research, founded by American Radiator Company

ON the north side of the testing-wing of the Institute of Thermal Research, founded by American Radiator Company, are situated the six rooms in which radiator tests are conducted. The object in having them on the north side of the building was to place them so that they would be free from the disturbing influence of the direct rays of the sun. At times when the sun would be shining there would be considerable warming effect taking place, which would not be the case on cloudy days. This in itself would be enough to cause an erratic performance of radiators under test.

The four intermediate rooms are exactly alike, both as to size (10 feet x 15 feet) and amount of exposed glass and wall surface.

The two end rooms are alike in size, 15 feet square, but have different exposures, one being on the north and east and unprotected, the other on the north and west and somewhat protected. In addition to this difference, one of these rooms has three windows as opposed to one in the other; and one room is provided with a chimney and grate, such as is ordinarily found in some residences.

This chimney was put in with a double purpose: to ascertain the aspirating effect of a flue on the amount of heat required to warm the room when radiation is used, and also to test the heating effects of coal and other fuel when burned in an ordinary basket grate. This chimney is provided with a damper which may be closed if desired.

The four intermediate rooms are particularly useful for testing purposes, for, being exact duplicates, four radiators of as many different styles may be placed in these rooms; and not only may the condensation be weighed and calculation made as to the condensing power of these radiators, but at the same time their heating effects on the room may be noted with exactness.

The steam supply for the radiators and the condensation from them are conducted through holes

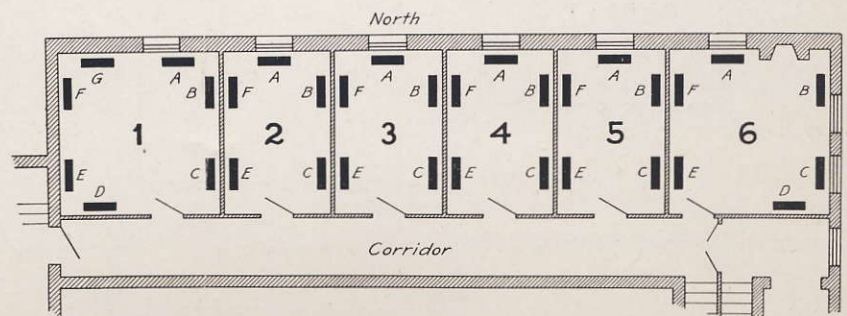
in the floor to a so-called weighing-room on the floor below.

The floors of the testing-rooms are provided with holes at a number of places, which are closed by cast-iron cover plates when not in use. This arrangement makes it very easy to put up a radiator in any desired position in the room, and still make the pipe connections quite short.

Steam for radiator tests is generated by a boiler situated in the weighing-room. Pressure on this boiler is kept between 10 and 15 pounds and is passed through a pressure-reducing valve, and the pressure lowered to 2 pounds or any other pressure that may be desired in the test. After passing through this valve the steam enters a receiver from which steam mains are taken off to supply the radiators on the floor above. These mains and the receiver are drained by hand-operated pet cocks, which are always set to blow a little steam. Immediately before entering the radiator the steam passes through a small separator to take out any possible trace of moisture in the steam, so that it will be dry and saturated when entering the radiator.

This has been found a most necessary precaution as very inconsistent results are liable to be obtained if the separator is even a few feet away from the radiator.

The condensing effect of the pipe from the separator to the radiator would cause some condensation to go through the radiator and be drawn off at the other end, with which the radiator would be credited;



A, B, C, etc., refer to the various locations in the room where radiators may be connected for test



when, as a matter of fact, it was not condensed in the radiator at all.

From the return end of the radiator a small pipe is led through a hole in the floor to a condensation pot in the room below. This pipe and the pot itself are both steam-jacketed, the condensation from the jacket being drawn off at one side and allowed to run to waste, only the condensation from the radiator itself being caught within the pot.

From the bottom of the pot the condensation may be drained off at any time and weighed.

Before using the steam-jacketed pot, it was customary to collect the condensation in a receptacle which was well lagged, in order to prevent as much as possible the heat loss from it. However, as no known insulator is able to entirely stop heat transmission, it was necessary to "calibrate the pot;" that is, to determine the amount of steam that would be condensed in the pot alone. This quantity would then have to be deducted from the total amount of condensation obtained, in order to determine the net amount condensed in the radiator.

With this new steam-jacketed pot, no correction is necessary, and another possible error is entirely done away with.

For weighing the condensation there are six pairs of specially constructed scales, one for each radiator under test. The pail into which the condensation is drawn is placed immediately underneath the condensation pot and on the scales, where it remains until filled.

These scales are so delicate that readings may be taken to the hundredth part of a pound.

The efficiency of a radiator is expressed by a coefficient in B. t. u., which shows the number of

British Thermal Units given off per square foot of heating surface per degree difference in temperature between the steam or water in the radiator and the air of the room surrounding it. Suppose the following items are recorded in a test:

Heating surface in the radiator	40 sq. ft.
Temperature of steam	218° Fah.
Temperature of the room	70° Fah.
Temperature difference between radiator and room	148° Fah.
Condensation per hour	9.86 lbs.

The computation to determine the coefficient is as follows: The condensation per square foot of heating surface per hour is 9.86 pounds, divided by 40, which is 0.2465 pound. As the latent heat of steam at 218 degrees Fahrenheit is 966.5, the number of B. t. u. given off per square foot of surface per hour is 0.2465 times 966.5, which is 238 B. t. u.

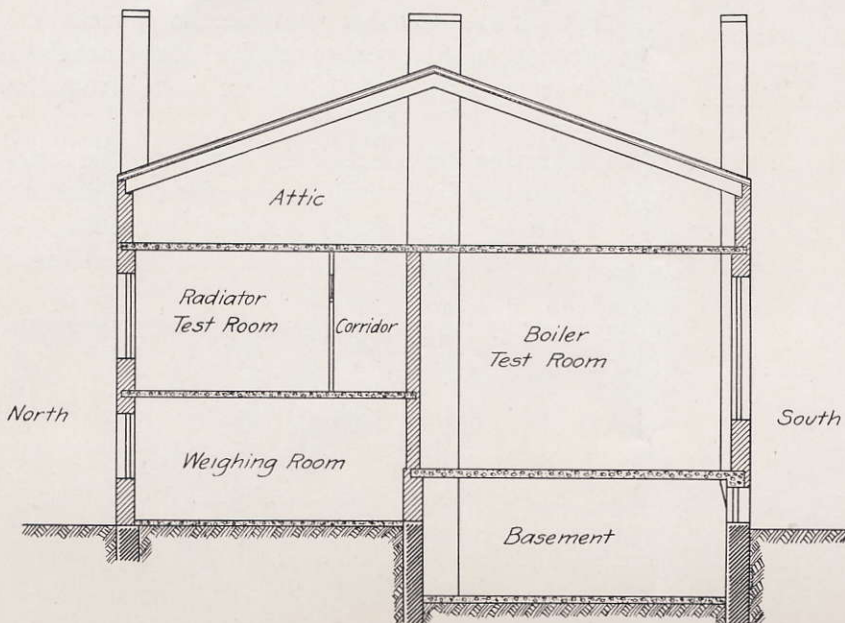
As the temperature difference between the steam and the air in the room is 148 degrees, the heat emission per degree of difference would be 238 divided by 148, which is 1.608 B. t. u. This figure is what we call the coefficient of the radiator and shows the quantity of heat given off per square foot of surface per degree difference between the temperature of the radiator and the air surrounding it.

This may be used to determine the quantity of heat given off from any radiator of similar design when placed in a similar location to the room in which it was tested.

If the temperature difference between the radiator and the air in the room is 140, 160, or any other figure within reasonable limits, this coefficient may be used to determine the amount of heat emission from it; but if the conditions of installation are widely variant

from those existing in the test-room, there will be a corresponding difference in the performance of the radiator and, in order to obtain reliable results, it would be necessary to duplicate as nearly as possible the actual conditions.

In old-time methods of test, instead of fitting up a special place for the testing of radiators, it has been the custom to take some large room and place the radiators under test on a platform in the center of the room, so as to have space enough below the radiator to place the condensation pot, the pail for the condensed water, and the scales. While this method doubtless gave good comparative results, still the actual coefficient obtained would be of



Cross Section of Portion of Institute of Thermal Research



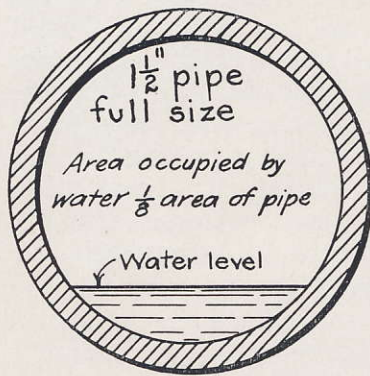
little value in determining the size of radiator necessary for heating a room in an ordinary residence, and the conditions were so different that the coefficient would be materially changed.

The rooms which we have in the Department of Thermal Research for testing radiators are quite similar to rooms such as would be found in an ordinary residence. No special building precautions were taken to prevent heat loss, the windows are not fitted any tighter than is customary, and as nearly as possible we have duplicated actual working conditions. Consequently, our Thermal Research tests instead of being academic are practical, rising out of conditions as they are, rather than from extra-favorable conditions, which tend to misdirect practice.

Space Occupied by Water of Condensation in Return Pipes

A few of the Trade have had the opportunity to ascertain for themselves just what space the water of condensation occupies in an ordinary steam-heating installation, information of this character should be acceptable.

Opportunity recently offered to measure in an actual installation the condensation from 2,838



square feet of radiation and 671 square feet of covered piping (total — 3,509 square feet) the return pipe being 1½ inches. The measurements were taken and repeated four times, so as to preclude possibility of error.

The initial pressure at the boiler was 2 pounds, and the total loss of pressure was ½ pound. The pitch of the pipe was 1 inch in 10 feet. The actual condensation per hour from the above radiation and piping was 730 pounds.

We show herewith a diagram of the relative space occupied by the water of condensation.

*“The melancholy days have come, the puzzling days of fall.
Not cold enough for furnace fires, too chill for none at all.”*



Murat Temple, Indianapolis

Heated and Ventilated by VENTO Heaters in tempering and re-heating stacks. D. A. Bohlen & Son, Architects.
Woolen & Callon, Heating Contractors

Pumping Pointers for Plumbers

THE young couple had taken a house in the suburbs of Boston for the summer, and they were besieged with company.

The men were enjoying the cool of the evening on the piazza, when one of the party remarked to his host:

“Do you know, Fred, there’s something the matter with your front gate? It took all my strength to open it. It needs oiling or shaving or something—”

“Neither one, old man; it’s all right. Every one that comes through that gate pumps two buckets of water into the tank up there on the hill.”

—*Youth’s Companion*

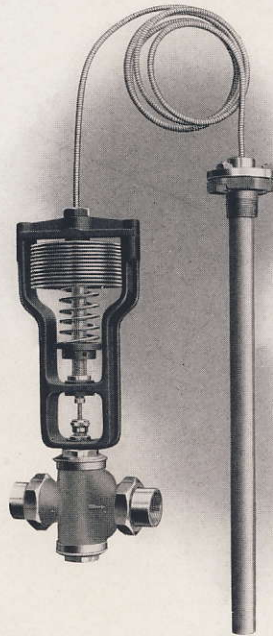
“To readjust the machinery of life, to freshen ideas and methods, to ring out old errors and ring in new enthusiasm; in other words, to infuse spirit into each detail of business is to raise the standards of commerce throughout the world. For some of the leaven will go on working in some direction forever.”



New Sylphon Tank Regulator with Spring

WE have just brought out a new type of IDEAL Sylphon Tank Regulator for controlling the temperature of liquids heated by steam. It is similar to the standard type No. 930 and operates in the same manner, but is equipped with a compression spring instead of a lever and weight. The new type is called the No. 931 IDEAL Sylphon Tank Regulator with Compression Spring.

The new Regulator is especially adapted to use on boats, cars, and on any apparatus that is in motion, where a quick movement might throw the weight



New No. 931 IDEAL Sylphon Tank Regulator with Compression Spring

and lever of the standard type regulator out of position and prevent accurate regulation. It can be installed in any position or angle in the pipe line. The adjustment for temperature (which is made by an adjusting nut increasing or decreasing the compression of the spring) cannot be easily tampered with by "meddlers."

All of the features of the standard type IDEAL Sylphon Tank Regulator (which has become famous for its accuracy and durability) are found in the new type. It is equipped with the "Sylphon" bellows, armored conduit tube, brass bulb, high-grade balance valve, and gives the same accurate regulation. It is made in all sizes from 1/2 inch to 2 1/2 inches inclusive, with standard temperature range—140 degrees to 200 degrees. The Regulator can be taken apart, in case it is desired to change the temperature range after installation. The cast-iron frame is made in two parts joined at the top, so that by removing two screws the "Sylphon" bellows, tube, and bulb can be removed and returned for alterations.

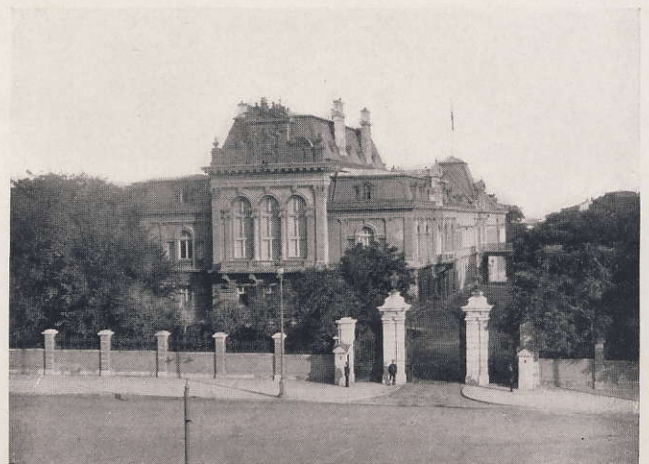
These Regulators are applicable to any apparatus in which liquids are heated by steam, or in which hot water is tempered by the injection of cold water. Aside from the wide use on hot-water storage tanks equipped with steam coil, and on instantaneous service heaters, they are being applied extensively to pasteurizing machines, boiler-washing apparatus, sugar-juice heaters, barometric condensers, sprinkler systems, feed-water heaters, railroad water-tanks, ammonia stills, creosoting apparatus, etc. There is hardly a factory of importance where these Regulators cannot be used to advantage, because of their extreme accuracy of regulation, absence of auxiliary power, and great durability. Heating contractors doing work for factories and large buildings can find a ready sale for IDEAL Sylphon Tank Regulators.

Send for complete circular and prices.

Re-cleaning the Cleaned Rug

WE quote from a report covering a No. 351 ARCO WAND Vacuum Cleaner, installed by Beasley & Miller, in Senator Porter's residence, at Pittsburg, Kansas:

"Senator Porter had a large heavy rug in old house and, when moved for builders, he took the rug out, had professional cleaners work on it and store it wrapped free from dust. When rug was replaced in new house, it was placed in attic, about 45 feet from ARCO WAND Cleaner. They thought the rug looked very clean and free from dust, but decided to try the new Vacuum system on it. The results were astonishing. The rug looked like a different piece of fabric; its appearance was very much cleaner and brighter, and upon examining the dust receiver was amazed at the amount of dust taken from the cleaned rug. Senator Porter is highly pleased with its work, and with the remarkable ease and thoroughness it does its work."



Royal Palace, Sofia, Roumania

Now warmed by IDEAL Boiler and AMERICAN Radiators



Dear Old Radiator

By Chester Firkins

*A Radiator seems to me
 The kindest reptile that can be.
 Its cobra coils of golden art
 Entwine the cockles of my heart.
 I do not blame poor Eve at all;
 For it was very cold—that Fall;
 Of course, she took the serpent's hiss
 For steam heat's everlasting bliss.*

* * * * *

*Some chronic quarrellers with Fate
 Defend—afar—the open grate;
 And others—at safe distance—love
 Long evenings by the kitchen stove.
 But my ophidian fancy finds
 More poetry in modern kinds.
 The radiator dear, I deem,
 Alone deserves my warm esteem.*

Cologne and Colonial

FRANK MILES DAY, the architect, desired to illustrate at the T-Square Club a piece of architectural ignorance. "Why," he said, "it was as bad as the woman who listened to a lecture on the Cologne cathedral, and at the end shook the lecturer's hand and said: 'Oh, thank you, sir, for your illuminating remarks. I often wondered where our colonial architecture came from. Now, of course, I see it comes from Cologne.'" —*Los Angeles Times*

Steam-Heated Flats in Heavy Demand, with Few Vacant

COOLED, early fall weather has created such a demand for steam-heated home places that there are now only a few heated flats or apartments left vacant on the market.

Prices for such places have been well maintained at from \$35 to \$50 a month for apartments of from four to six rooms each, according to locality.

At this season of the year owners have no inducement to cut rentals for steam-heated rooms, as under ordinary conditions occupants move out in the spring and leave a vacancy for which there is no demand, at any price, until winter comes again.

One owner who has twelve apartment houses with seventy-eight apartments directly west of Skinker Road, said yesterday that out of the whole lot he had only one vacancy left. —*St. Louis Star*

"The great thing in this world is not so much where we stand, as in what direction we are moving."



Photo Copyrighted by F. W. Woolworth

Woolworth Building, New York

Cost about \$13,500,000. Excepting the Eiffel Tower in Paris, highest structure ever erected on this planet—750 feet high—55 stories—all heated with AMERICAN Radiators, installed by Thompson-Starrett Co., Heating Contractors; Cass Gilbert, Architect; L. E. Eden, Mechanical Engineer; Nygren, Tenney & Ohmes, Heating Engineers

Let your mind be full of purposes instead of wishes.

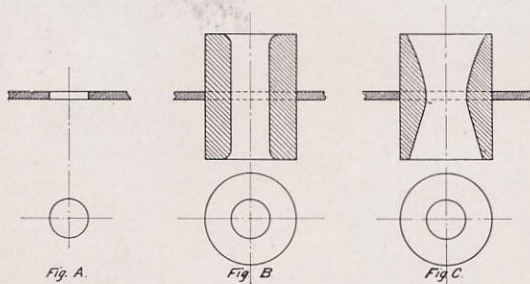


Character of Orifice Equally Important as Size in Vacuum Cleaner Construction

QUESTION. Does the character of the orifice or opening, independent of the size, through which air passes under a given pressure or suction, influence the amount of air passed?

ANSWER. To calculate the amount of air which will pass through any given circular orifice under pressure, it is usual to multiply the cross sectional area of the orifice by the velocity of the air, which is determined by consideration of the difference in the pressures on the two sides of the orifice. The result, usually expressed in cubic feet per minute, has a theoretical value, and will be in error, due to the fact that the character of the orifice has not been considered.

Sharp edges around the orifice have a retarding influence on the passage of air, causing eddy currents at the entrance to and also at the exit from the orifice, which has the effect of restricting the movement of air. Furthermore, the length of the orifice, or the thickness of the wall through which it passes, as well as the design of the edges of the orifice, affect the result.



For instance, an orifice in a thin plate, say $\frac{1}{16}$ of an inch in thickness, as illustrated in Figure A, has more retarding effect than any other, and only about 65 per cent of the theoretical volume of air will pass through this orifice. An orifice as shown in Figure B, with rounded edges, the length of the orifice or the thickness of the wall through which it passes being equal to three times the diameter of the orifice, will pass approximately 85 per cent of the theoretical volume of air. An orifice designed, as shown in Figure C, known as the Venturi, offers very little resistance, and approximately 95 per cent of the theoretical amount of air will pass through this orifice.

The above percentages or efficiencies of these various openings are approximately true, of course, only within certain small limits of diameter and pressure, and apply with accuracy to the orifices which we have chosen for testing.

From the foregoing, it will be apparent that a manufacturer may claim that he is able to maintain a vacuum of 5 inches mercury column with his machine when air is entering through a $\frac{3}{8}$ -inch ori-

fice, and it will mean very little until he has designated the characteristics of the orifice he is using. If he is using, for instance, a $\frac{3}{8}$ -inch orifice in a thin plate and obtains 5 inches of vacuum and seeks to compare results with a No. 351 ARCO WAND, which tests to 5 inches of vacuum with air entering through our standard testing orifice, $\frac{3}{8}$ of an inch diameter, the length being equal to three diameters or $1\frac{1}{8}$ inches, his machine only delivers air in comparison with the ARCO WAND in ratio of 65 to 85.

Service equivalent openings, therefore, are in no sense comparable unless they conform identically to the same rules of designing.

We have chosen a standard form of service equivalent opening conforming to Figure B, solely because it is a great deal easier to make up with accuracy than either of the other forms mentioned.



North American Bldg., State and Monroe Sts. Chicago
This building reveals a striking example of the present tendency to put much architectural character at the top of the structure, to give special individuality in a city of competing sky-scrapers. Holabird & Roche, Architects. Heated with AMERICAN Radiators and Vento Heaters, installed by John R. Kehm Co. (Majestic Building at left, also heated with AMERICAN Radiators)



*We're crazy to get back to nature,
 Provided 'tis furnished, mowed, screened,
 Garaged, steam heated, well lighted,
 Upholstered and vacuum cleaned!*
 —Chicago Daily News

Tank Regulators in Actual Practice

By E. S. White

REGARDING the Sylphon Tank Regulator installed at the Boston State Hospital, when I asked them at the hospital about how close the regulator controlled the water, they laughed at me, as they said they did not go near their heaters month in and month out, so they were not in a position to know, except that every few months, when they had happened to notice the temperature of the water, it would be at 160 degrees. This, they stated, was in marked contrast to their experience with regulators before they put in the Sylphon, as they were continually being called to the heater, because the water was extremely hot or stone cold. I found, after some inquiry, that the heater which was photographed and sent to you was used in the center building at the Pierce Farm, and that this heater supplies with hot water the kitchens, the nurses' quarters and the doctors' quarters. From meter readings I found that there were used in the neighborhood of 3,846 gallons per day, the water being kept at or about 160 degrees, the steam pressure at 30 pounds. The heater is 7 feet long by 28 inches diameter.

I had a talk with the cook, as I thought he would be in a pretty good position to tell me about the service resulting from the regulator, and I found him greatly enthusiastic over the Sylphon Tank Regulator. He said that the experience that they had had with the old rubber diaphragm water-operated regulator had been most trying for him, as the thing was continually getting stuck, either wide open or entirely closed off, and it interfered very materially with his work. He stated that he had never had a bit of trouble since the Sylphon Tank Regulator had been put in, and since that time they had put the regulators in the north and south wings of the same building, and these, too, had given the same sort of service.

I found every one connected with this institution greatly enthused over the Sylphon Tank Regulator, and ready to speak a good word for it.

BOSTON, MASS., July 8, 1912
 AMERICAN RADIATOR COMPANY,
 Boston, Mass.

Gentlemen: In all my twenty-five years' experience in handling big plants in public installations, I never saw an automatic device that operated so nicely as the Sylphon Tank Regulator does. A couple of years ago we installed one, replacing a regulator with a rubber dia-

phragm with water connections, which had given trouble, and this Sylphon Regulator has worked so nicely and given such good satisfaction that we have since installed several wherever we have put in new work or had to make repairs. We are, at this time, having one more regulator added to our present equipment in one of our new buildings.

Very truly yours,
 (Signed) ARTHUR E. MORSE,
 Chief Engineer Boston State Hospital,
 Pierce Farm,
 Austin Farm,
 Psychopathic Hospital.

A Belleville merchant has this sign on his store door:

"Come in without knocking. Go out the same way."



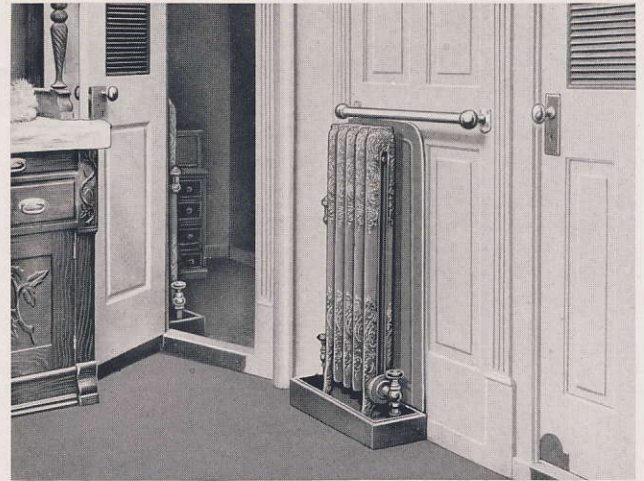
Yuan-Shi-Kai

President of the new Chinese Republic
 Photo taken immediately after he had signed the proclamation announcing the birth of the new Republic. Note at the back the presence of an AMERICAN Radiator—destined (?) to be "the power (for comfort) behind the throne"



radiator heating plant, and will last as long as the building itself. The public is cordially invited to see the clever demonstrations. Annual house-cleaning, dusting, step-ladder climbing, back-straining, lifting and sweeping are forever abolished for womankind. Come and see it.

Come and see the wonderful demonstration of the ARCO WAND Vacuum Cleaner at Frost, Snow & Kleen's store on Tuesday and Wednesday, Sept.—th and—th. We want all the ladies to see this clever device while it is here. No more working and breathing in a cloud of dust and germs, no more beating, no more dusting, no risky step-ladder climbing, no lifting and moving of furniture, no more back- and arm-straining work. All dirt, dust, cobwebs, lint, threads, germs and trash are drawn through iron suction pipe to sealed, disfectant bucket in cellar. The ARCO WAND Vacuum Cleaner becomes a permanent fixture to your home—like a radiator heating plant—nothing to wear out. Everybody come and see it work.



Hugging the Delusion

THE Beilharzs give mixed programs of impersonations, singing and playlets. Their evening's work is hard, and they appreciate comfort after it is over. So they were writing ahead regularly to secure warm rooms at their hotels.

Reaching one place Mr. Beilharz said to mine host: "Did you get my card about the warm room?"

"Yes, sir; I got it all right."

"Is there a stove in the room?"

"No; but a stove-pipe from the parlor below runs right up through it."

"Oh, that will be all right," said Mr. Beilharz. "There'll be sure to be a fire in the stove below?"

"Well, mister, we hadn't planned to put up that stove for a week or so yet."

A Well-Warmed Vessel

A first-class, single-screw, steel steamship recently built by the Racine Boat Co., for the Lighthouse Board of the Great Lakes Service. The boat has 22 AMERICAN Radiators with Norwall Packless Radiator Valves and Norwall Air Valves. The view shows a Two-Column Rococo with hand rail and towel dryer over it. The installation was made by J. J. Howden Company of Muskegon, Wisconsin

The great secret of success, the mark of real genius, is the ability to understand men, to read and mold human nature. I would rather hire one man who knew men than two who knew railroading. One can learn to run a railroad, but he can't learn to be the master of men. That is a gift of nature.

—Marvin Hughitt, Pres. of C. & N. W. Ry.



A Big Group of IDEAL Boiler-Makers

Michigan Plant (American Radiator Company) industrial army at Detroit. Five hundred and fifty-six skilled foundrymen, core-makers, machinists, pattern and flask makers, inspectors, draughtsmen, packers, forwarders, watchmen, with managers, superintendents and office force—many having served terms of fifteen to twenty years and over, and some twenty five years. Ability, fidelity, perseverance and team-work of this group in a large measure account for the excellent qualities of IDEAL Boilers



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SPOKANE	1019 Paulsen Building
BIRMINGHAM	406 Chamber of Commerce Building
NEW ORLEANS	328 Hennen Building
TORONTO	20 Victoria Street
BRANTFORD, ONT.	17 Market Street
LONDON, W.	439-441 Oxford Street
PARIS	149 Boulevard Haussmann
BERLIN	35 Alexandrinen Strasse
DUESSELDORF	68 Koenigs-Allee
BRUSSELS	75 Boulevard du Nord
MILAN	7 Via Tomaso Grossi
VIENNA	4 Paulanergasse

Manufacturing Plants

BOND	Buffalo, N. Y.
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STANDARD	Buffalo, N. Y.
DETROIT	Detroit, Mich.
MICHIGAN	Detroit, Mich.
TITUSVILLE	Titusville, Pa.
STEELE	Springfield, O.
LITCHFIELD	Litchfield, Ill.
BIRMINGHAM	Birmingham, Ala.
HOLLAND	Bremen, Ind.
KANSAS CITY	Kansas City, Mo.
BRANTFORD	Brantford, Ont.

In Praise of Steam Heat

Hygienic Gazette

THE steam-heated apartment has become a synonym for degenerate luxury and both popular and technical articles condemning the dry air of modern houses and flats thus heated frequently appear. In fact, we have just finished reading in a medical journal such an article, in which a good share of present-day decadence is attributed to life in a dry heat of 80 to 85 degrees, day and night, with infrequent trips into the open air.

First of all, it is very questionable whether a general decadence and degeneracy, even in the well-to-do class, really exist. To use a term suggested by our topic, we are inclined to designate literature which takes this for granted as "hot air." Census reports show a lower mortality than ever before. Where, for example, up to a generation ago, could one find a mortality rate so low as 14-1,000? The average longevity has increased almost a decade within the memory of men still in active practice.

* * * *

We can see no reason why the installation of radiators in place of hot-air furnaces or even of stoves and grates should lead persons to maintain a temperature of 10 or 15 degrees too high or to avoid ventilation or outdoor exercise. That the financial ability to maintain physical comfort renders one loath to undergo privation and exposure is a long-observed fact, but, under modern conditions, physical comfort is enjoyed by many persons who are compelled to exert themselves strenuously to earn a living. Moreover, so far as we can read the history of every-day life, there has never before been a period when great wealth was accompanied with so vivid an appreciation of the importance of hygiene nor when luxury invited to so many forms of outdoor sport, unless we go back to the period of knight errantry.

* * * *

Most intelligent families at present fully appreciate and practice the rules as to ventilation and outdoor exercise. Certainly, a continuously and evenly warmed house in which sleeping apartments may be thoroughly aired without notably diminishing the temperature of dressing and living rooms, and without themselves becoming quite so cold as the outer air, rather favors the practice of sleeping with the window open. So far as our recollections and present observation goes, the older inefficient system of heating houses did and does, where it persists, strongly tempt the occupant of a cold bedroom to keep his windows closed.

Modern closed methods of heating * * * by steam or hot water * * * * respectively have a tremendous advantage over older methods



in eliminating an important element in the vitiation of the air. A single gas jet consumes more oxygen and throws out more carbon dioxide than a human being. Some slight contamination with carbon monoxide from illuminating gas is almost inevitable, and the same gas, as well as sulphur compounds, escape from stoves, furnaces and fire-places, even passing directly through red-hot iron.

A Special Installation of Arco Wand Vacuum Cleaner

WE quote from a report recently received of the installation of an ARCO WAND Vacuum Cleaner in a sky-scraper office building:

A No. 462 ARCO WAND Vacuum Cleaner is installed in the United Gas Improvement building on the second floor. There is one 2-inch riser line extending from machine, about the center of the building, up an unused elevator shaft, which takes in eleven inlet couplings, or a coupling for each floor, from the second to the twelfth inclusive.

The chief engineer advises that they clean every part of each floor where an outlet is installed, and further, that the satisfaction thus far experienced with this machine is equal in every way to their expectations. He personally, after the installation was completed, went to the twelfth floor and sprinkled flour, sand and match-sticks over the carpet in one of the offices, rubbing same in thoroughly with his feet, then started the machine to see just what it would do—the hose being coiled and not in a straight line—with the result that the carpet was thoroughly cleaned to the entire satisfaction of the superintendent of the building as well as the chief engineer.

This machine is supplied with 100 feet of 1-inch hose, and it is necessary for them to use the full 100 feet to reach some parts of the building, and even with this long hose, the results have been entirely satisfactory.

The total height of the building from the second to the twelfth floor is 132 feet. This height, of course, is reduced when the floor of the twelfth story only is being cleaned, but, of course, when the walls are being cleaned, the full height will be effective.

Prior to the installation of the ARCO WAND Vacuum Cleaner, a portable-type machine was used, being carted from one floor to the other. The chief engineer states that it was never possible for the man cleaning to clean more than one floor in a day, and then carpets were not thoroughly cleaned. Now, however, it is possible for one man, with an ARCO WAND machine, to clean a floor in a quarter of a day, at the same time thoroughly cleaning same.

Advertising That Pays as You Go

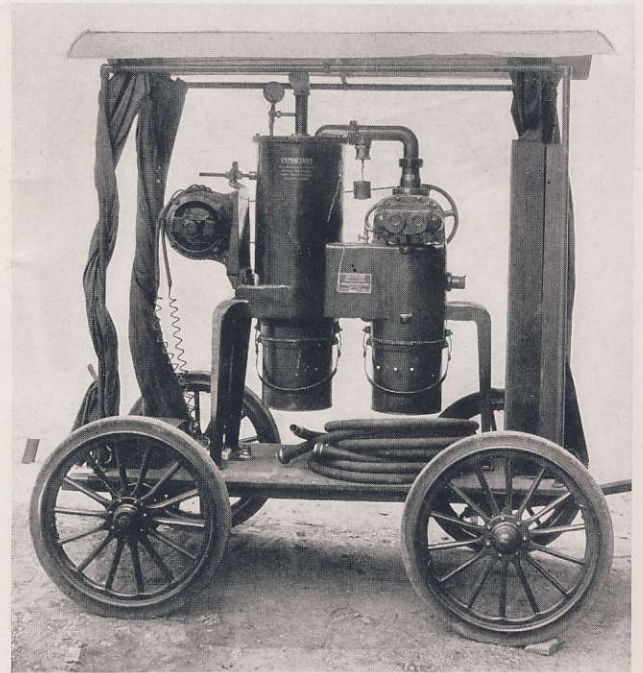
A PLUMBING concern in the South, wishing to interest their townfolk in the ARCO WAND Vacuum Cleaner, mounted a sample machine on an old automobile truck, and sent the outfit from building to building, giving visible demonstrations of its cleaning work.

The plumbing concern issues a circular to their townsmen, offering the machine for public service, and quoting these rates for service:

“One cent per square yard for general room cleaning. This takes everything in the room, also walls and ceiling. No less than two rooms cleaned at this price—one cent per square yard.

“Where rugs and carpets only are cleaned at the homes, 4 cents per square yard.

“Where material is sent to our shop to be cleaned,



ARCO WAND Vacuum Cleaner mounted on platform of an old auto truck

we make the following rates: Rugs, 3 cents per square yard; Mattresses, 50 cents each; Upholstered Chairs, 10 cents each; Upholstered Sofas, 25 cents each.”

By this method the sample machine is made to earn a good income, while operating to show just how the ARCO WAND does easy house-cleaning. Instead of asking the housekeepers to come to the machine, the machine goes to them, and demonstrates its utility in practical fashion. The sample ought soon to pay for itself, and often sell itself, or a sister machine. Others who have trucks may find them available for this purpose, and thus easily increase their sales.



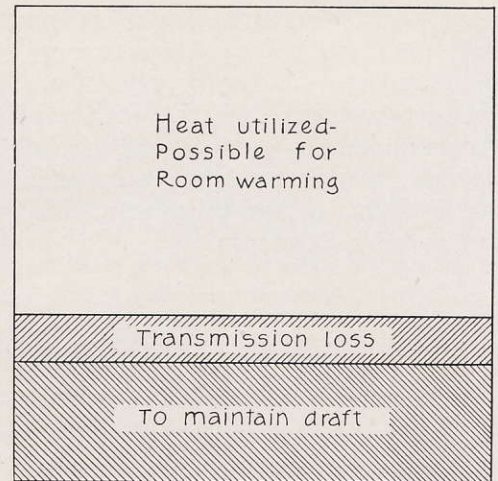
Heating Economy vs. Power Waste

THERE is a popular misconception on the part of the public frequently expressed in about the language used by the editor of the *American Agriculturist* when recently addressing a body of business men at Minneapolis:

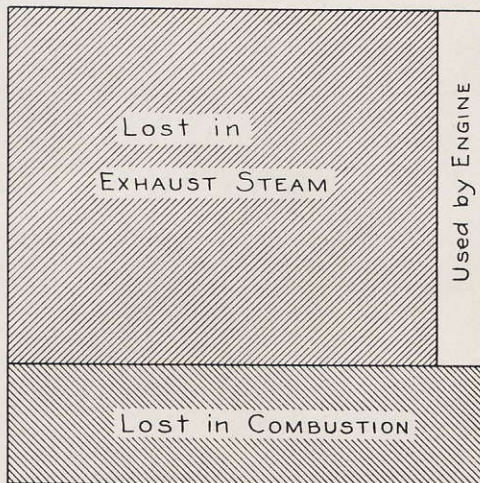
"Probably not more than 15 per cent of the energy in the coal you burn in your boiler is expressed in the heat supplied to your house."

The learned editor, like many other individuals, is sadly mixed in his "figurative speech" endeavors to compare house-heating boilers with the ordinary power boilers connected to engines which waste their exhaust.

The accompanying graphic charts illustrate that in either house-heating boilers or power boilers about 25 per cent of the fuel is required to maintain a



Use of heat units in the highest type of low pressure or house-heating boilers



Loss of heat units in making power, where exhaust steam is not utilized

heating. It is a reasonable statement, therefore, that from 60 per cent to 75 per cent of the heating power of the coal burned in the modern types of IDEAL Boiler is fully used to bring about the real purpose of the purchase of the outfit of IDEAL Boiler and AMERICAN Radiators, namely: Transmitted to raising the temperature of the rooms. Every time a statement is made, like that at the beginning of this article, it behooves everyone in the heating industry to set the person right, for the good reason that house-heating boilers and radiators—when properly installed—are very important factors in the domestic economy of the community.

What's the use of working nights when you have all the day before to do it?

draft (not necessarily wasted; inasmuch as there would not otherwise be thorough combustion of the fuel). The ordinary power boilers, with engines which waste their exhaust, do not as a rule yield more than 10 per cent to 15 per cent of the heating power of coal in producing mechanical force—and the balance (about 65 per cent) escapes in exhaust steam. The best conservation of heat energy is made when the exhaust steam is utilized for heating purposes in factories, etc., by means of AMERICAN Wall Radiators or VENTO Heaters.

Of course, engines for special condensation or triple expansion equipment do not waste all this heat energy.

With IDEAL Steam Boilers, of a 100 per cent total of the heat-making or thermal power of the coal burned in their up-keep, about 25 per cent goes to maintain a draft (not wasted), just as stated above in the case of the power boiler. As there is no general waste of steam, the balance is available for room



National Golf Club, Shinnecock Hills, L. I., N. Y.
A famous International course, where the world's champions all play "guid gowf." Architect, Jarvis Hunt.
Heating Contractor, Alexander Cameron

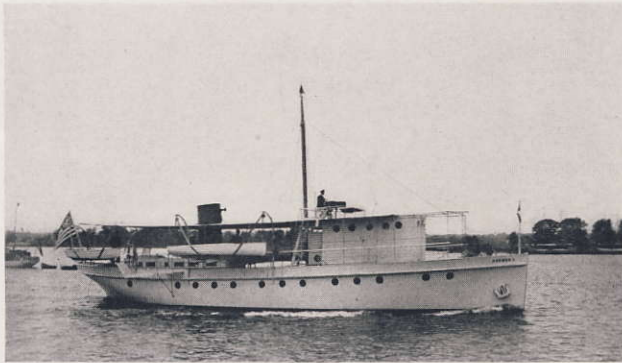


Heating a Sea-Going Pleasure Boat

From the "Rudder"

THE new twin-screw sea-going motor cruiser, Arawan II., built for Mr. Charles Longstreth of Philadelphia, for summer and winter use along the Atlantic Coast, is heated throughout with hot water, American Radiator Company "system."

The boiler is located in the crew's quarters, and the necessary radiation is obtained by wall radiators in the different compartments. The coal supply is carried in a bunker behind the heater, arranged to fill through the deck and having outlets under both the heater and the galley stove. The heating is required, as the boat will be used through the fall and



Twin-Screw Motor Cruiser, Arawan II.

Designed by Bowes & Mower, Architects; Heating Contractors, John S. Sheppard Co. Heated by hot water, using 120 square feet AMERICAN Rococo Wall Radiators and IDEAL No. 1115 Boiler

winter months, for shooting and fishing, in southern waters.

The boat is 71 feet over all, 16 feet beam. Has double staterooms, single stateroom, bath, dining saloon, deck house, engine-room, galley and fore-castle.

KANSAS CITY, May 20th.

AMERICAN RADIATOR COMPANY,
Kansas City.

Dear Sirs: Kindly accept my thanks for yours of the 17th, regarding the summer care of my Regitherm. By the way, you know I have your full equipment—hot water with natural-gas fuel. I set my IDEAL Sylphon Regitherm October first, last, and the furnace has not been touched once since. The house has not been under 68 nor over 72 one hour all winter. Surely no one could ask a more perfect winter than I have just had.

Yours very truly,
B. T. WHIPPLE,
4538 Warwick Blvd.

It is better salesmanship to help a customer buy something than sell him something. In the first instance, you have his assistance; in the second, you must go it alone.



Home of Mayor of New York City

Mr. Gaynor's country residence is located at St. James, Long Island; warmed by AMERICAN Radiation installed by Jedlicke Bros., Sayville, L. I.

Government Expresses Preference for Vacuum Cleaner Pump

THE following extract is taken from a book entitled "Mechanical Equipment of Federal Buildings under the control of the Supervising Architect, Treasury Department," which expresses a preference for the type of pump employed by us in the construction of the ARCO WAND Vacuum Cleaner.

The reasons given for preferring this type of pump show careful study of the subject:

"Rotary exhausters of double impeller type are limited to a peripheral velocity of 1,100 feet per minute to insure quiet running; they are required to be provided with gearing running in oil or grease, and must be fitted with water jet for cooling and sealing the impellers. This type of exhauster is more economical than the best reciprocating type of exhauster at all vacuo below 12 inches. They are practically free from wear and also from damage due to foreign substances entrained in the air entering the exhauster. They are less in first cost and require few repairs."

This statement agrees with the conclusion arrived at in the tests of vacuum cleaner apparatus made by Professor M. S. Cooley, of the University of Michigan, and recited by him in his paper read in January before the American Society of Heating and Ventilating Engineers, and published in the heating trade journals.



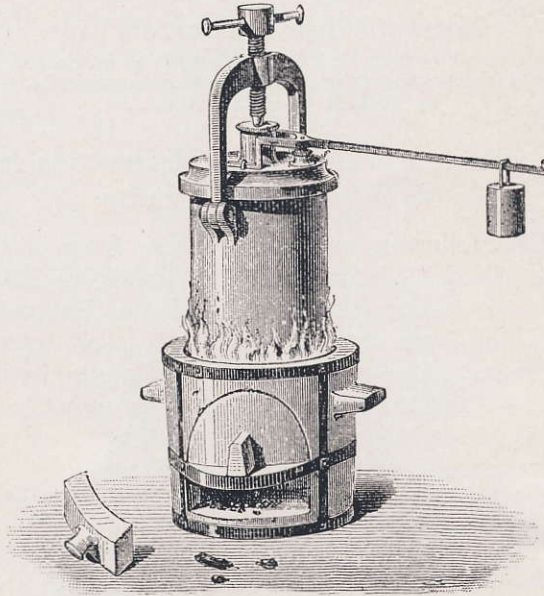
**Residence of the Comedienne, Miss "Billie" Burke,
Hastings-on-the-Hudson, New York**

Heated with IDEAL Boiler and AMERICAN Radiators; also fitted with IDEAL Water Heater for domestic supply, and ARCO WAND Vacuum Cleaner. Williams & Cullinan, Heating Contractors



The First Safety Valve

IT is a singular fact that the appetite for delicate foods was a prime motive in making steam an agency for comforting the human race during the inclement seasons. Without the safety valve, steam heating could never have been made practicable, and it is, therefore, interesting to note the historical circumstances connected with the invention of the little



The First Safety Valve, by Papin

valve which made it possible to handle steam pressures with safety, first, for cooking apparatus, then for both heating and power purposes.

The first safety valve was invented in 1681 by Denis Papin, a Frenchman, who was born at Blois, France, in 1647. He commenced his experiments on the phenomena of steam in July, 1676, at London, under Robert Boyle, the distinguished Irishman who founded the Royal Society of London. About 1780 Papin brought out a little steam apparatus called "Papin's Bone Digester" for softening animal bones for "cookery, voyages at sea, confectionery, chemistry, and dyeing."

Charles II. ordered Papin to make a digester for his laboratory at Whitehall, and the invention excited much interest. By means of this steam-pressure cooking machine, delicious jellies were made from beef, mutton and other bones. Enormous strength was needed in the machine to stand the high pressure generated, and Papin found that he could only make his machine successful by contriving a mechanical device which would release pressure at a certain point and thus prevent explosion.

This he finally worked out during 1681 in the first steam-pressure safety valve; then his machine could be utilized without fear. A hundred years later

James Watt and others made use of his invention in connection with a steam-power engine, and later in the eighteenth century Watt and other inventors made use of a similar contrivance to insure the safety of steam apparatus utilized for heating purposes.

Papin was one of the great benefactors of the human race. Living in the age of Pascal, Newton, Boyle and Leibnitz, he partook liberally of the spirit of progress, which was a work in those days to free the human race of its shackles imposed by ignorance of natural laws, and it may well be said that Papin "buildd better than he knew." He was both a prophet and executor of mechanical progress, and his memory is one of the sacred treasures of the power and the low-pressure steam-heating industries.

Puzzle: When is a Vacuum Cleaner a Mouse Trap?

DEAR Sirs: Yes, sirs, it's a fact! Returning from a vacation, my wife found three tiny baby mice in a bureau last night—result of carelessly leaving the bottom drawer open an inch or two. Did she scream? Yes, for a minute. Then she thought of the ARCO WAND Vacuum Cleaner. Happy idea! From the top of a chair, she poked the end of the Vacuum Cleaner Wand around in the drawer. Instantly that cleaning tool touched a mouse, plunk! you could hear him strike the bottom of the dust bucket down cellar. Can you beat it? What with woman suffrage and freedom from mice, this country is sure looking up for the women folks.

Yours truly,

A. L. K.



Marconi Works at Chelmsford, England

Where wireless outfits are made. Building completed in ten weeks after starting foundations; capacity for 1,400 men; warmed by two IDEAL Water Boilers; 240 AMERICAN Radiators are used to deliver heat, circulated by an electric centrifugal pump; also one IDEAL Boiler installed for hot-water supply



Victoria and Albert Museum, Cromwell Road, London, England
Sir Aston Webb, R. A., C. B., Architect. Warmed and ventilated by
AMERICAN Excelsior Indirect Radiation

Regitherms Used for Drying Varnish, Paints, etc.

WE have come across a very interesting installation of the IDEAL Sylphon Regitherm. It appears that in all factories where wood-work is varnished, especially furniture manufactories, piano factories, carriage and automobile factories, it generally takes about six hours for the varnish to dry properly. Within the last two or three years engineers have been working on a drying-room, which is heated with a steam coil on one side of the room. On the opposite side is a condensing coil through which cold water is run. This cold water coil is maintained at just about the dew-point, so that all of the moisture in the air is taken out. The IDEAL Sylphon Regitherm is being used to maintain the temperature of the air, by operating a valve in the steam supply, and the Sylphon Tank Regulator— $\frac{1}{2}$ -inch size—is being used to maintain the temperature of the water in the condensing coil. A piston-type valve is used, reversed, and the thermostatic bulb is placed in the coil, so that as the water in the coil becomes warmer than about 85 or 90 degrees, the valve is opened.

This allows the water to flow out of the coil and fresh colder water to come in.

The Sherwin-Williams Paint Company, one of the world's largest manufacturers of paint, are using the IDEAL Sylphon Regitherm in this way.

Impressionable

LITTLE TYPIST—"How did you catch cold, Mazie?"

TALL STENOGRAPHER—"Writing those letters about refrigerators and ice-houses: that's no kind of work this weather."

Yes, Mawruss, word-of-mouth advertising is best, understand me, but something has to start

that word-of-mouth advertising. And another thing, something is needed to keep it going *oder* something must start it going again if it should stop. *Verstehen?*

If a man empties his purse into his head, no one can take it from him.

—Ben Franklin



The Old Parsons Homestead, Northampton, Mass.

Built in 1755. A beautiful, treasured "landmark" of the city. Now heated with IDEAL Boiler and AMERICAN Radiators. Owner and occupant, Mr. Lewis D. Parsons (a direct descendant of original builder). John W. Draper, Heating Contractor



A Model Vento Installation

THE heating and ventilating plant installed in the new Chicago & Northwestern Railway Terminal Station, in Chicago, includes a fine example of the application of VENTO Heaters.

The first series of VENTO sections are used for tempering the air. Between the two groups of sections, air washers are placed for cleansing the air of all impurities; after the air is cleansed, it is passed through specially constructed separators, and all of the water eliminated, after which it is drawn through the second group of VENTO Heaters.

The first group of Heaters is so arranged as to heat the in-coming air in the coldest weather to about the temperature of the water in the air washer (which is about 50 to 60 degrees). After the air is cleansed the second group of heaters raises the temperature to about 120 degrees in the coldest weather. This temperature is maintained to meet all of the varying conditions of the outside air

by automatic regulation, which shuts off one or more tiers of sections, as the weather requires. All the water of condensation is drawn from the VENTO sections by means of a vacuum system (the vacuum pumps are shown in the picture at the far end of the heating chamber).

It is notable that in this fine installation the VENTO Heaters are double-decked or tiered, and that the upper sections rest on the lower ones, with nothing intervening excepting pieces of $\frac{1}{4}$ -inch boiler plate. It was not deemed necessary or desirable to furnish expensive iron framework to support the upper tiers, the architects and engineers taking the position that if the VENTO sections were once tight they would remain so, and that being cast-iron throughout they would not rust or leak. Therefore, it would be unnecessary to take them down except in the event of an accident, which is highly improbable.

The wages of carelessness is failure.

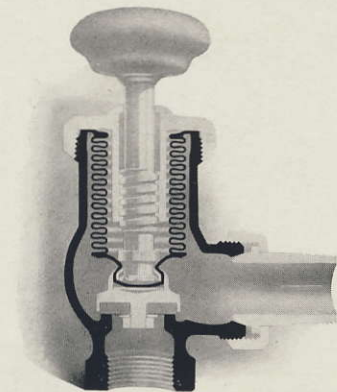


One of the two chambers of VENTO Heaters used in New Terminal Station of Chicago & Northwestern Railway in Chicago

Architects, Frost & Granger; Pierce, Richardson & Neiler, Heating Engineers; installed by Kehm Brothers Company

Tight and Easy - Turning Valve

NO little defect in a steam heating outfit causes more annoyance to both house-owner and steam-fitter than the escape of steam or water around the handle stem of *ordinary radiator valves*. Such valves become most expensive when you add to their purchase price the cost of labor to re-pack. This fussing and expense never follow the use of the



The black lines show the unbroken metal wall which makes leakage impossible

Sylphon Packless Radiator Valve

which is absolutely and forever steam- and water-tight around the stem. Valve is entirely metal; is without any packing whatever—being surrounded by the “everlasting” Sylphon brass bellows—which contracts or expands as stem is screwed up or down. Besides, SYLPHON Packless Valve handle always *turns easily*—cannot stick or bind. Send for circulars.

Sold by all Jobbing Supply Houses or through the Sales Branches of

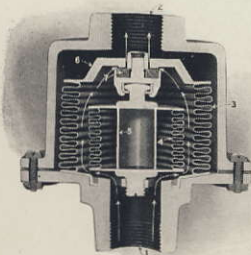
AMERICAN RADIATOR COMPANY

Special Vent Valves

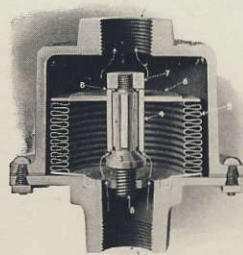
HERE is a special line of Vent Valves for two-pipe vapor, vacuum or atmospheric work which utilizes the “everlasting Sylphon brass bellows” principle very successfully.

SYLPHON VENT VALVES

placed at the end of the returns quickly and thoroughly vent all the air from the piping. No. 525 valve is made specially to operate by both pressure and temperature; No. 526 by pressure only. SYLPHON Vent Valves are all metal; no parts to wear out, or get out of order; will last forever. Send for special circulars.



No. 525 Valve



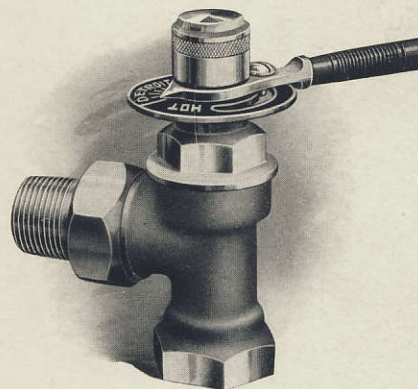
No. 526 Valve

Sold by all Jobbing Supply Houses or through the Sales Branches of

AMERICAN RADIATOR COMPANY

An Accommodating Valve

“Any port in a storm” runs the old nautical adage—but it won’t do for the modern steam-fitter on the job, who so often fervently wishes for the one right port to control his vapor system with the exact, accurate supply—no more, no less. In the use of the new



Detroit Multi-Port Vapor Valve

the old slogan is changed to “Any port for the job”—because so easy to adjust. One valve with 18 adjustable ports. You do not have to order and try a lot of valves with different perforations; but as you learn on the job just how much vapor each radiator requires you adjust *Multi-Port* valve to exact port required.

.3655		.387
.3225		.344
.2795		.301
.2365		.258
.1935		.215
.1505		.172
.1075		.129
.0645		.086
.0215		.043
		.0

Showing the 18 areas of adjustable ports in one valve, running from .0215 to .387 square inch

Even if on further test or changed local conditions it is found valve admits too much or too little vapor, you can quickly re-adjust it by releasing a set-screw and rotating the handle on valve bonnet.

Send for new circular.

Sold through all Jobbing-Supply Houses or the Branches of

AMERICAN RADIATOR COMPANY