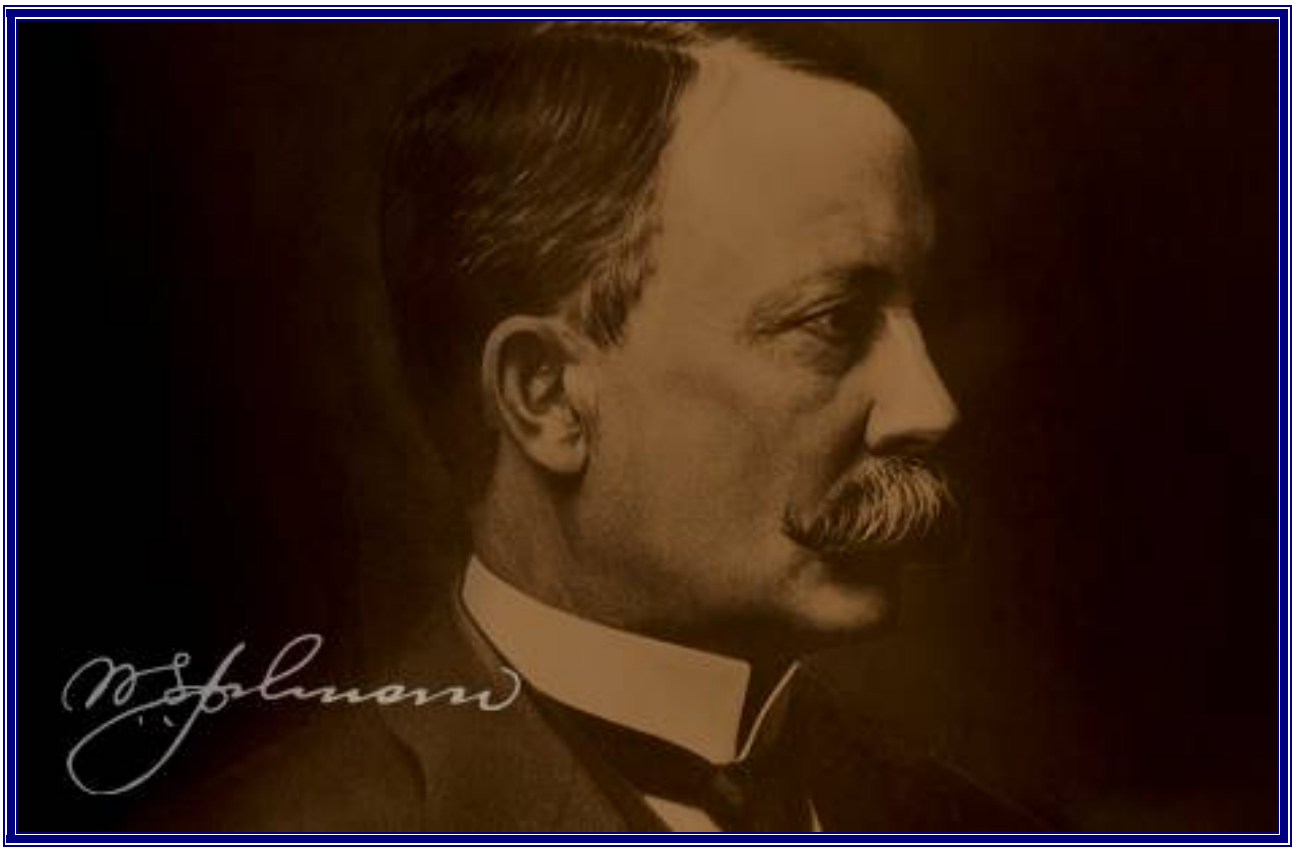
WARREN S JOHNSTON

By EurIng Brian Roberts, CIBSE Heritage Group



Professor Warren Seymour Johnston, 1847-1911

Warren Johnston was born in 1847 in Rutland County, Vermont. As a young boy, he showed a strong interest in inventions from "sketches and descriptions covering a wide range of subjects in mechanics, chemistry and electricity." Later, he worked in Wisconsin as a printer, superintendent of schools and then a Surveyor of the Plains. Johnston next taught at the State Normal School (Whitewater College), Wisconsin. In 1873, he invented an alarm or "annunciator" system to alert the janitor as to which rooms required heat:

> The Normal School was heated by enormous hot air furnaces. On cold days when they were going full blast, from the large registers in the floor of the lower halls, we could see the glow of the cast-iron furnaces. The only control of room heat was by hand-operated dampers at the furnaces. Once an hour or so, the janitor would make the rounds of the rooms and make a note of which rooms were too warm or too cold. He would then go to the basement to open or close dampers accordingly. This disturbed the classes considerably, so Professor Johnson installed electric thermostats in each room and connected them to *annunciators* (which he invented), so that when the thermostat made contact on the warm side, the indicator for that room would show "Warm" and ring a bell, and when the contact was on the cold side, the indicator showed "Cold." All the janitor had to do besides firing the furnaces and keeping the place clean, was to watch the annunciator every time it rang and shift the proper damper.

About 1883, having moved to Milwaukee, Johnson formed a business partnership with financier William Plankinton as the Milwaukee Electric Manufacturing Company, to market his invention. That same year he received a patent for his *electric tele-thermoscope.* In 1885, the Johnson Electric Service Company was established.

Johnson came up with the idea of using compressed air to power valves and dampers, having been familiar with the use of small air compressors in his school laboratory experiments. He patented his *electro-pneumatic valve* in 1885, where a small compressed air valve could be operated by an electric thermostat to open or close a steam valve or air control damper. Compressed air at a pressure of 15 pounds per square inch operated in conjunction with battery generated electricity (from salammoniac batteries since dry batteries were not perfected at this time).

Between 1885 and 1911, Johnston was involved in many other business activities, including electric storage batteries, steam and gas powered vehicles, huge pneumatic clock towers and wireless telegraph communication systems.

Professor Warren Seymour Johnson died in 1911 and from that moment the company decided to focus solely on its temperature control business for non-residential buildings.

Logo from cover of Johnson Controls 100th Anniversary book

(No Model.)

W. S. JOHNSON.

ELECTRIC TELE-THERMOSCOPE.

No. 281,884. Patented July 24, 1883.

Fig. 1.

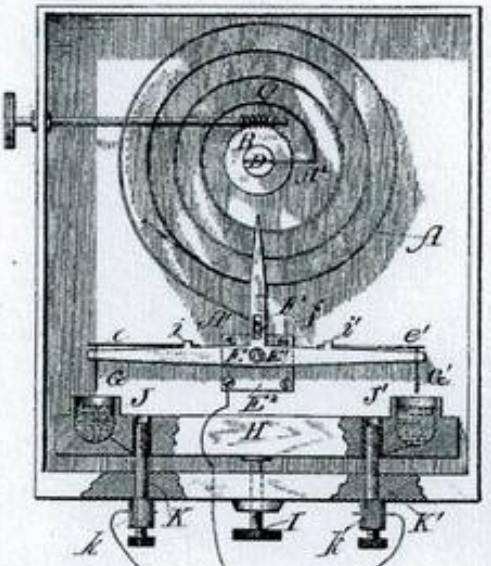
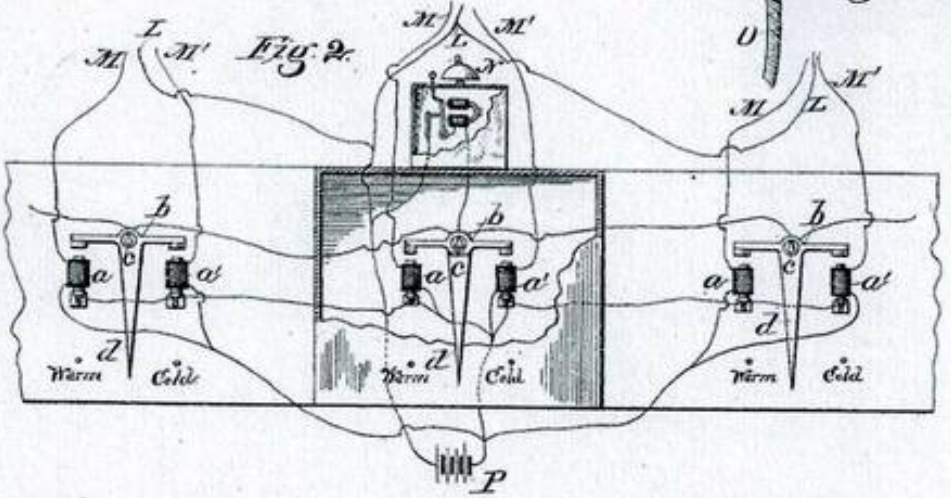


Fig. 3.

Fig. 2.



Witnesses:

E. G. Asmus

M. Kaumheimer

Inventor:

Warren S. Johnson

By

Stout & Underwood

Attorneys.

UNITED STATES PATENT OFFICE.

WARREN S. JOHNSON, OF WHITEWATER, ASSIGNOR OF ONE-HALF TO WILLIAM PLANKINTON, OF MILWAUKEE, WISCONSIN.

ELECTRIC TELE-THERMOSCOPE.

SPECIFICATION forming part of Letters Patent No. 281,884, dated July 24, 1883.

Application filed April 3, 1883. (No model.)

To all whom it may concern:

Be it known that I, WARREN S. JOHNSON, of Whitewater, in the county of Walworth, and in the State of Wisconsin, have invented certain new and useful Improvements in Electric Tele-Thermoscopes; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to devices adapted to indicate, at any convenient point, the relative temperature in rooms, conservatories, cellars, &c., situated at a point remote from the location of the indicators of my device; and it consists of certain peculiarities of construction, as will be more fully set forth hereinafter.

In the drawings, Figure 1 represents a thermostatic transmitter located in the room whose changes in temperature are to be noted. Fig. 2 is a view of the indicators; and Fig. 3 is a detail of the conducting-wires which connect the parts just named.

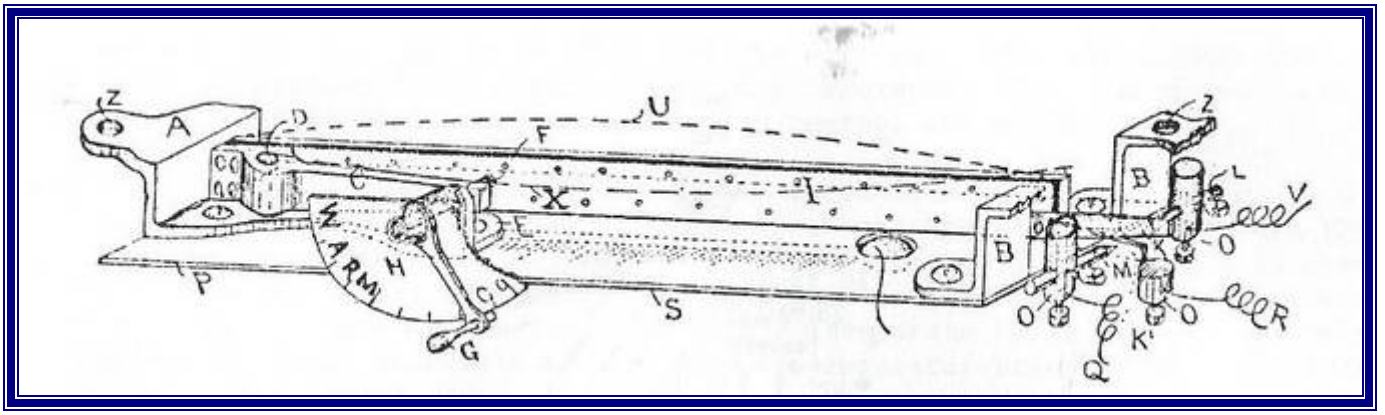
A represents a coiled spring composed of thin strips of two or more metals of different expansibility soldered or otherwise firmly fastened together in such a manner that any change of temperature will cause one end of the spiral, as A′, to move, providing that the other end, as A², is fixed. In the illustration given the coil is to be understood as having its most expansible metal on the outside—for instance, spring-brass for its outer portion and spring-steel for its inner lining, their ratios of expansion being in the neighborhood of 8 to 5. The end A² of the coil is fixed firmly to an axis, which bears a toothed wheel or lever, B, which is governed in its movements by the endless screw C. The toothed wheel or lever B is fixed firmly to the axis D, which holds the spring A. At the extremity A′ of the spring is an oscillating beam, E, resting upon the "knife-edge" or other anti-friction point, E′. The oscillating beam E bears with it an index, F, which is slotted at *f′*, and within this slot a pin, *f*, plays, and as this pin *f* is secured to the end A′ of coil A the expansion or contraction of the coil will cause it (the pin *f*) to crowd the index either to the right or left, as the case may be, and the slot will allow sufficient vertical play of the pin to prevent any mechanical strain on the coil, which would tend to throw the two metals out of adjustment one with the other; and this is a very important feature of my invention, as the coils are very delicate and susceptible to strain. The oscillating beam E has at its extremities the needle-points G G′, which project below. For the sake of accuracy the needle-points G G′ are not attached rigidly to the beam E, but to the springs *e e′*, which are fastened at convenient points, as *i i′*, and these springs, like the slot in index F, serve to relieve the coils from strain, for if the points G G′ were rigidly attached to the beam E, then, when such a temperature was reached as would cause one end of the beam to dip far enough for its point to strike the bottom of one of the mercury-cups, which are designed to receive them, there would be a strain sufficient to destroy the adjustment of the metals in the coil and render its registry inaccurate; but by attaching the points to the springs I avoid any liability of such mishap.

J J′ are the mercury-cups for receiving the points G G′. They are seated in or upon a bar, H, of non-conducting material, and this bar rests upon a screw-bolt, I, by which it is adjusted vertically to vary the distance between the mercury and the points G G′, so that a greater or less deflection of the beam E may take place before contact is made.

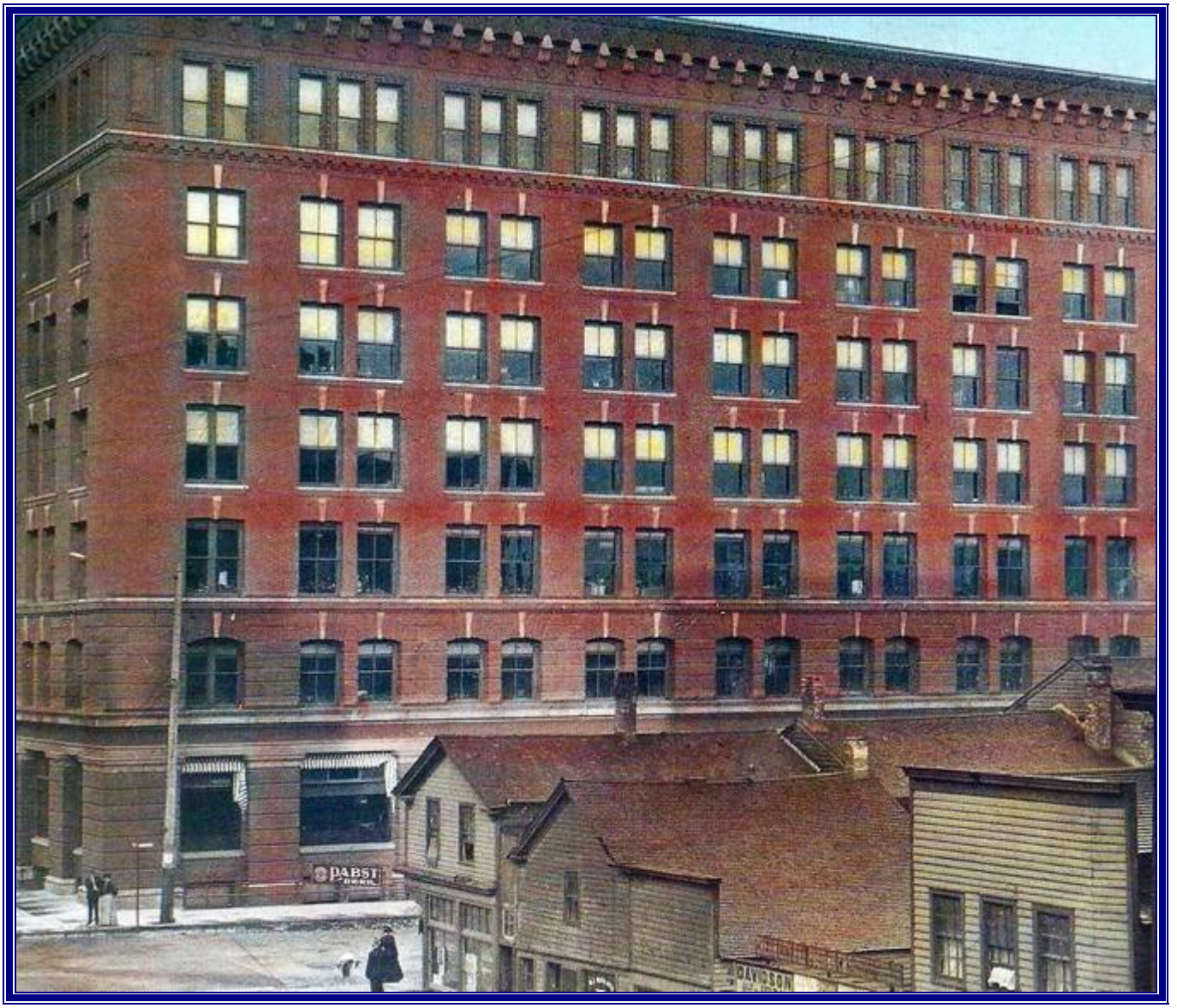
K K′ are metallic posts, which are passed up through the bottom of the case of my apparatus and enter metal-lined holes in beam H, and not only serve to balance the beam, but make electrical connection with the mercury through small wires.

It is evident that any movemet of the end A′ of the coil A will cause the beam E to take an oblique position, and, if the movement be great enough, to dip a needle-point into one or the other of the cups of mercury J J′. Supposing G and J to be the poles of a battery, when the needle-point G touches the mercury J the circuit will be closed. Under like conditions the same will be true of G′ J′. It is also evident that if the bar H, bearing the cups J J′, be raised by means of the thumb-screw I a smaller oscillation of the beam E will close

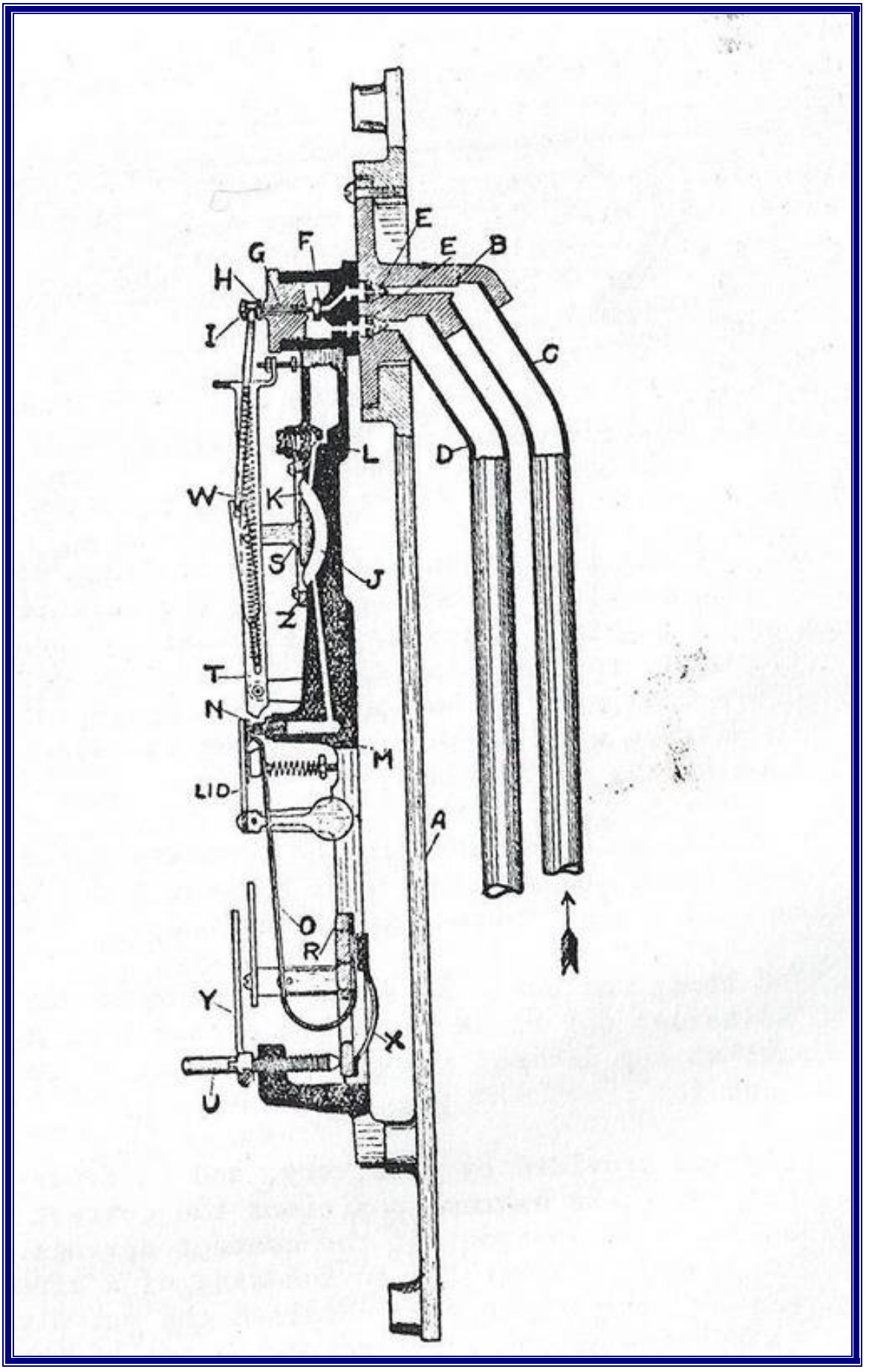
Early Johnson combined thermostat & thermometer



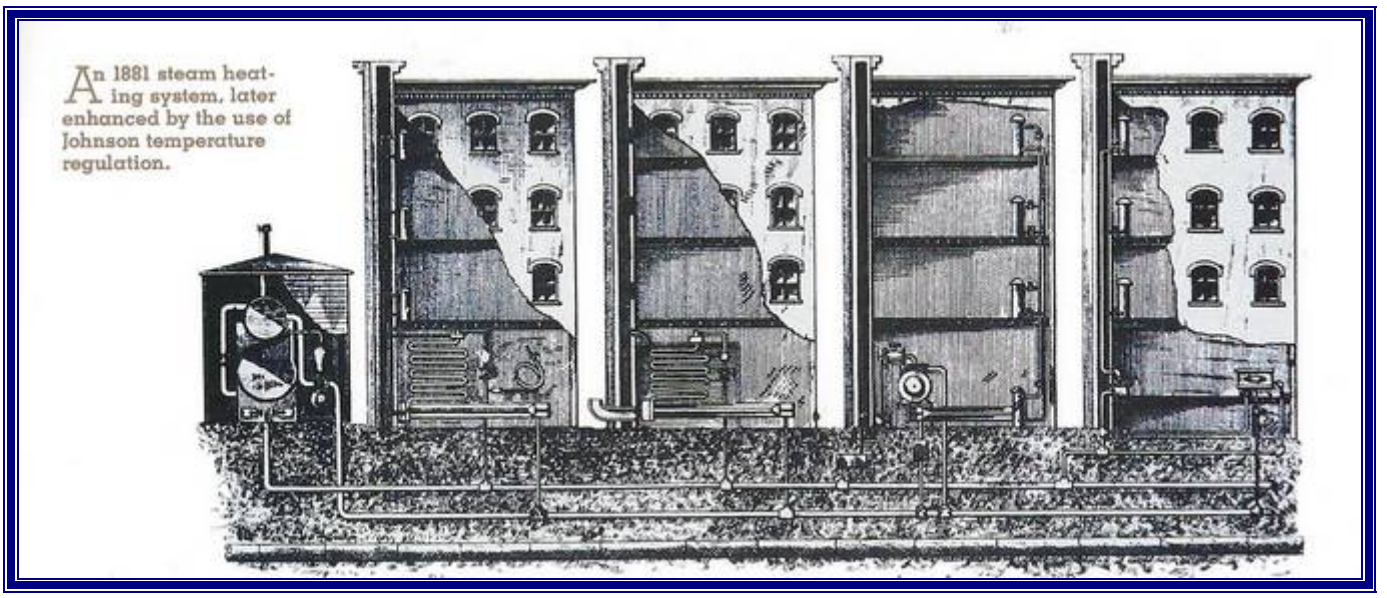
Johnson electric thermostat, 1890



Johnson's Milwaukee Office Block from 1902



Johnson pneumatic bimetal thermostat, c.1912



1881

Family Wealth
Economy, Comfort, Health.

The Husband Explains.

Wife:—John, dear, how do you account for your present even temper?

Husband:—Can't you guess, Mary?

Wife:—I can't imagine unless it is our new furnace draft regulator.

Husband:—Exactly, Mary. It may seem odd to admit this, but the comfort and economy that has been added to our home by the Johnson Draft Regulator is simply remarkable. It saves vexatious annoyances, and saves money besides. It insures an even temperature, and that means an even temper. An even temper keeps me at home, and completes our domestic happiness.

The moral is plain. How often do not the things which appear insignificant, contribute the largest share towards completeness of life. A moment's reflection only will convince that a

JOHNSON FURNACE DRAFT REGULATOR

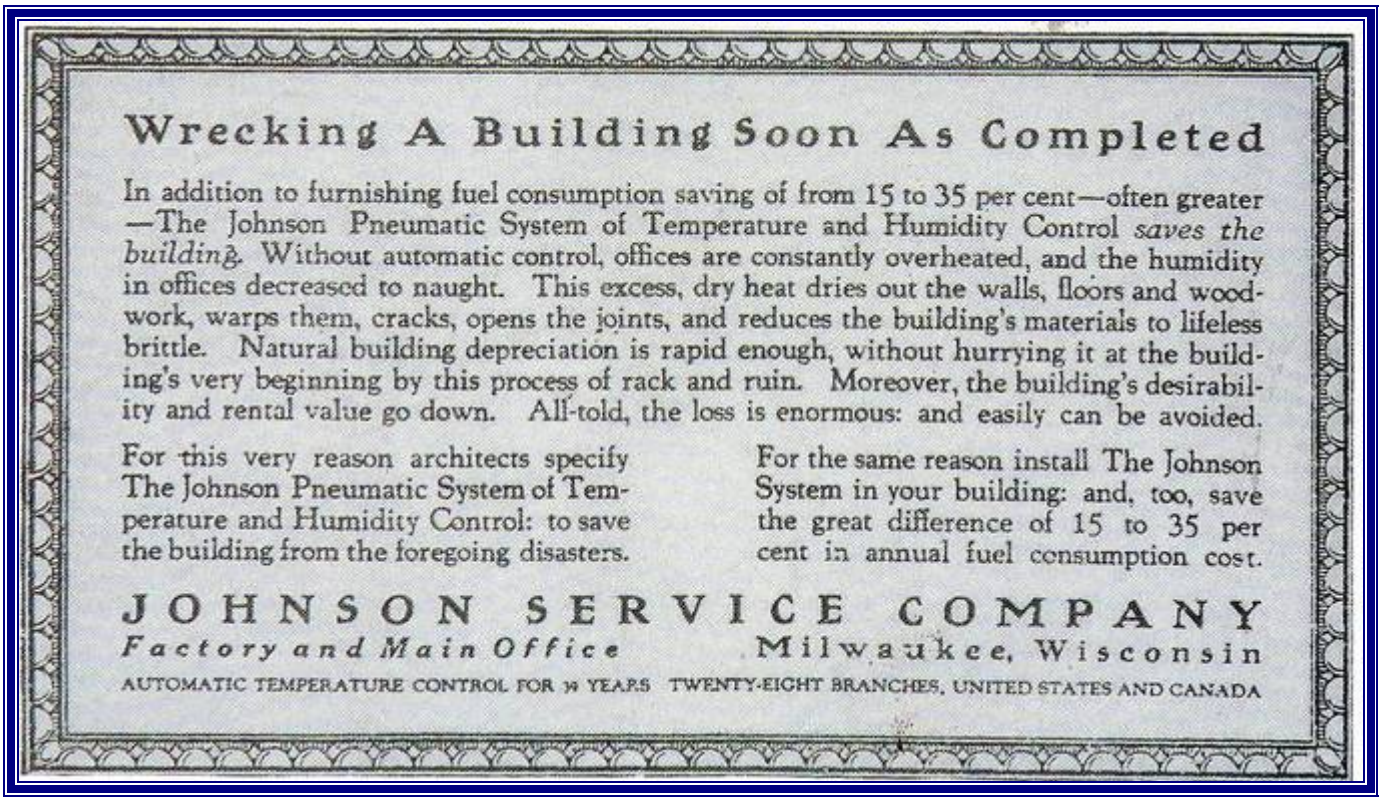
can effect a decided saving in household expenditure. A thermostat placed in your room automatically regulates your furnace drafts, without taking up your time or attention. This thermostat is specially devised to meet the wants of private families.

Price of the Draft Regulator, complete, put up, $25.00. For sale by all furnace dealers.

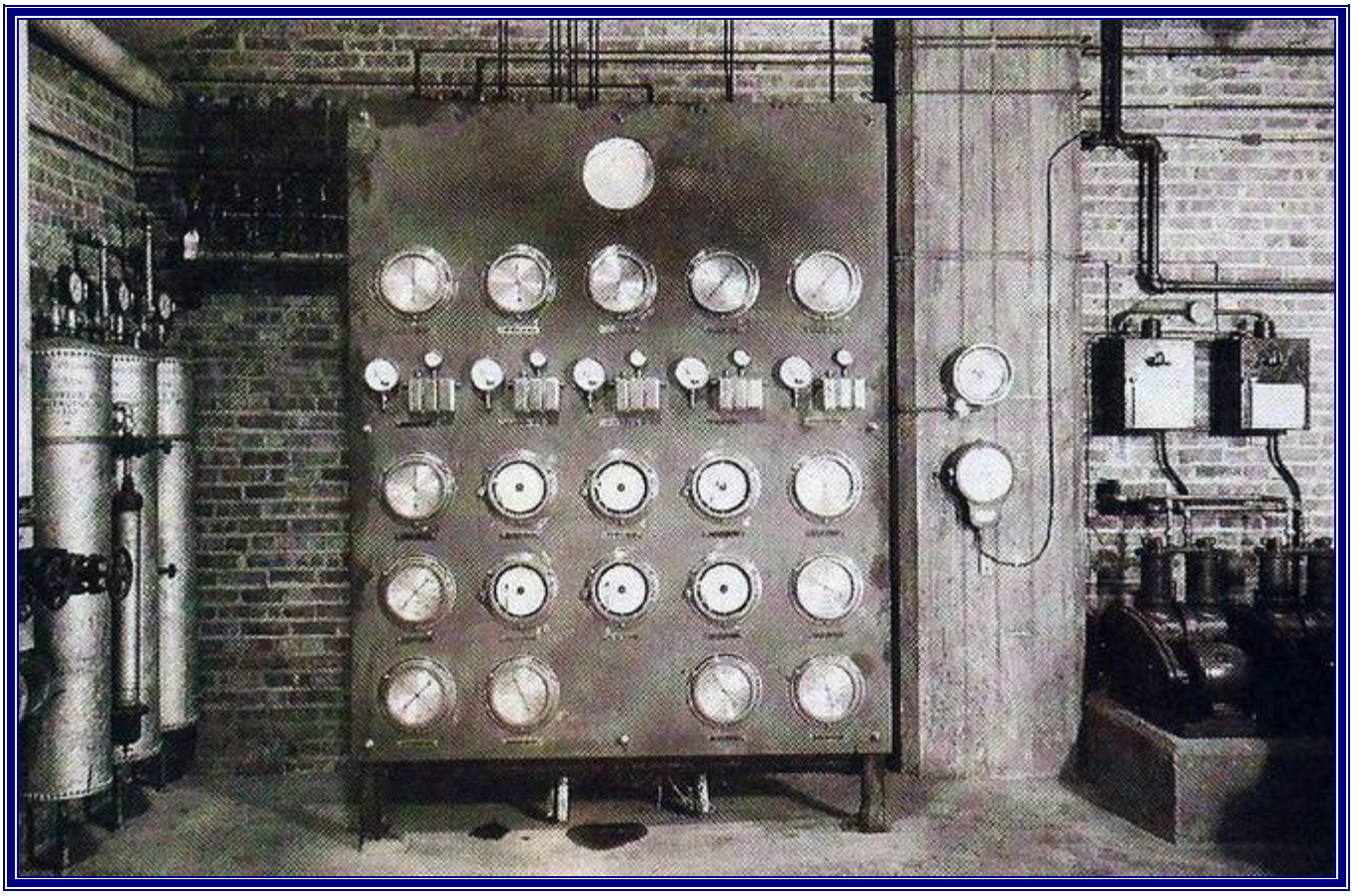
THE JOHNSON ELECTRIC SERVICE CO.,

12 Pearl St., Boston, Mass.
91 Diamond St., Pittsburgh, Pa.
25-26 Hodges Bldg., Detroit, Mich.
120 Sycamore Street, Milwaukee, Wis.
Johnson Heat Regulating Co., 104 N. Tenth St., St. Louis, Mo.
Electric Service Co. of Buffalo, Erie County Bank Building, Buffalo, N.Y.
Johnson Temperature Controlling Co., 411 Dearborn St., Chicago, Ill.
Johnson Temperature Regulating Co., 240 Fourth Ave., New York City.
Philadelphia Electric Service Co., 41 N. 11th St., Philadelphia, Pa.

1896 advertisement

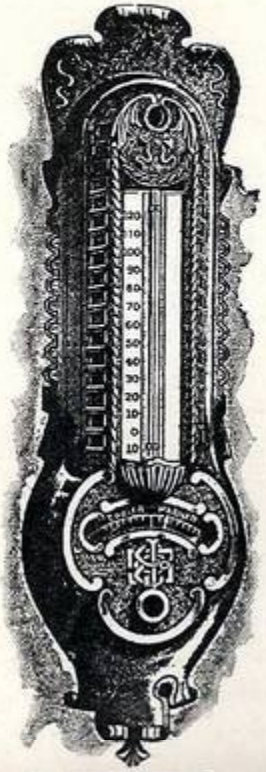


1922 advertisement



School temperature control board, c.1922

TEMPERATURE REGULATION.



THERMOSTAT.

THE

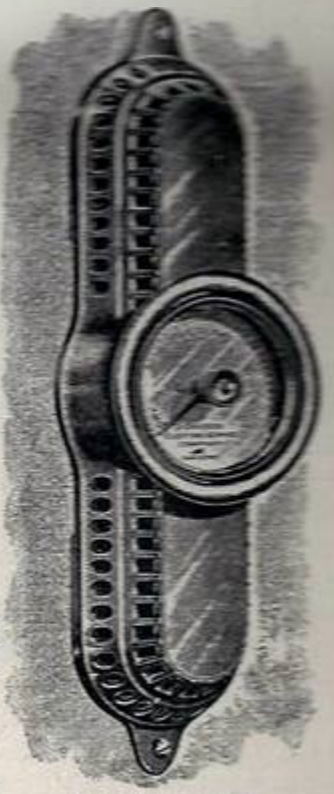
JOHNSON SYSTEM OF TEMPERATURE REGULATION

has been in public use since 1885 with ever-increasing favor, and is now used ***in all classes*** of buildings where heating is required. This is the original and perfectly developed system and is applicable to every kind of heating device.

THE

HUMIDOSTAT

controls the humidity of rooms within 2%, thus securing health, comfort, and economy. The only device made securing these results. Address



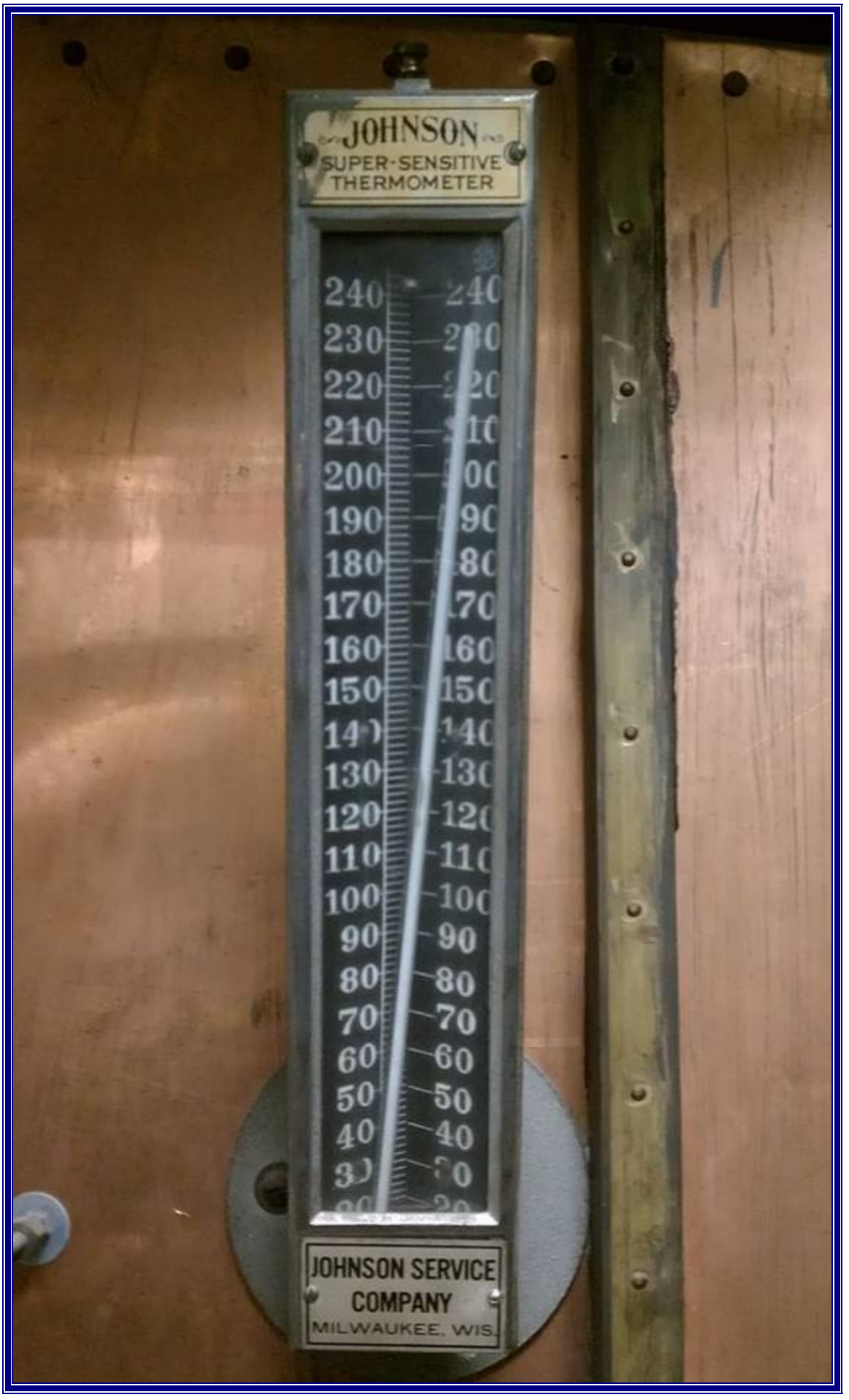
HUMIDOSTAT.

Johnson Temperature Regulating Company,

240 FOURTH AVENUE, NEW YORK CITY.

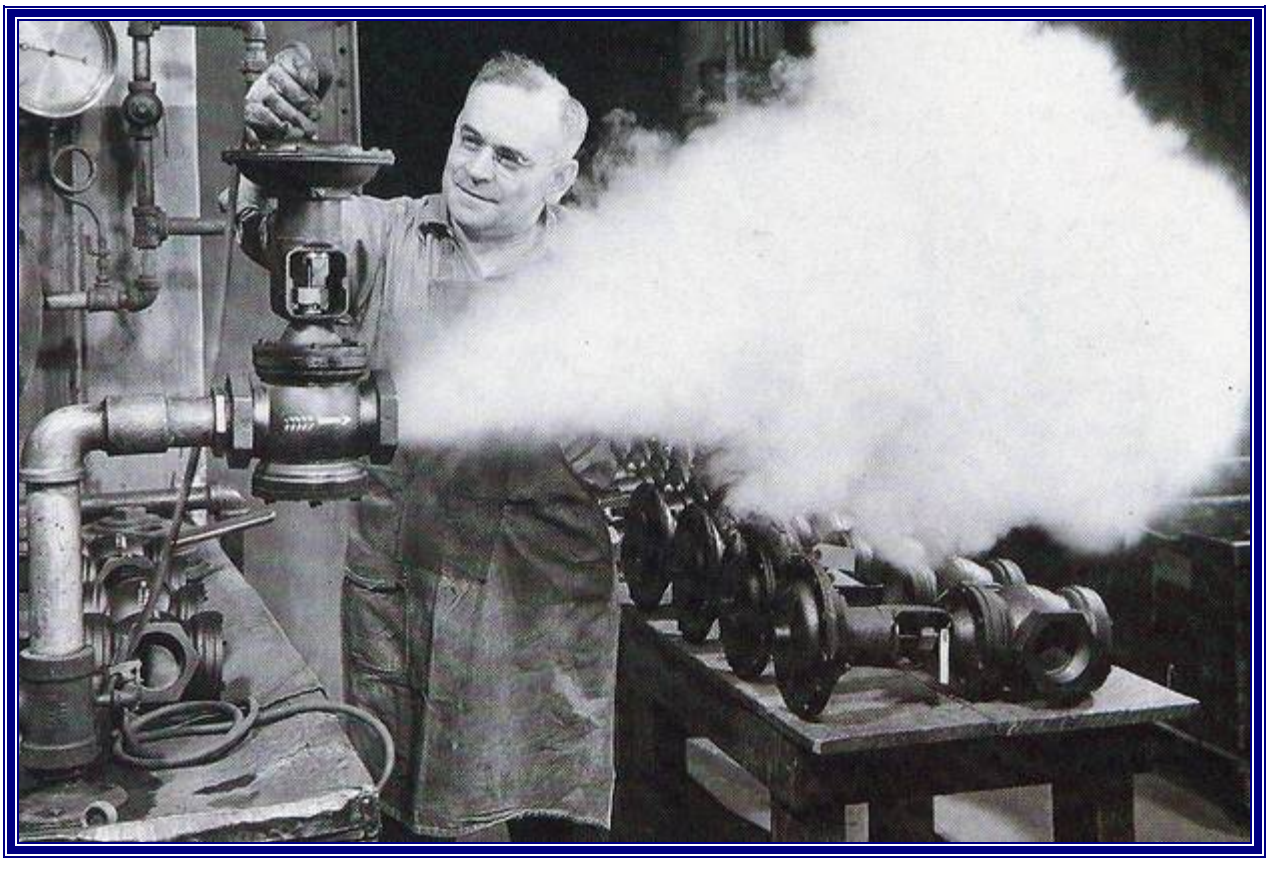
1

1910 advertisement



Johnson “Super-Sensitive” thermometer

Sales Force of 1900 (W S Johnson is 3rd from left front row)



Testing a steam control valve, 1944

Professor Warren Seymour Johnson

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