

REAL ESTATE

# Controlling Steam Radiators

By ROY FURCHGOTT MARCH 11, 2016

While studying for his Ph.D. in electrical engineering at Columbia University six or seven years ago, Marshall Cox regulated his room's temperature in winter the way most New Yorkers with steam radiators do. He opened a window.

But then his twin brother, Jeremy, moved to New York to dance in "Come Fly Away" on Broadway. His brother complained "incessantly," Mr. Cox said, that "it was boiling, or freezing, many times both over the course of a night." It drove Marshall Cox to invent the Cozy, a radiator cover that can contain the warmth in an overheated room and shift it to an underheated room. The Cozy, which Mr. Cox has described as a "glorified oven mitt" and which is being sold on a limited basis, went on to win a \$220,000 M.I.T. Clean Energy Prize in 2012.

The Cozy's victory is understandable. It addresses a problem that has afflicted New Yorkers since the early 1900s, when oversize radiators were necessitated by a Board of Health directive requiring open windows on even the iciest winter days. This was back when "fresh air" was considered the universal cure-all.

Today's apartment and condominium dwellers needn't suffer, though. Thanks to modern technology, energy-saving programs, and a handful of tradesmen versed in century-old plumbing techniques, there are a variety of fixes to tame runaway radiators.

Much of New York City's overheating problem can be attributed to the Spanish Flu epidemic of 1918, said Dan Holohan, a historian of heating and the author of 18 books on the subject. "I first spotted this in my engineering books from the 1920s," he said. "The authors would mention the 'Fresh Air Movement' and caution that both boilers and radiators now had to be much larger because of the need to keep windows open by command of the Board of Health."

Fresh air was specifically thought to ward off airborne illnesses like the flu. Although the Spanish Flu abated in 1920, the engineering standards dictating oversize radiators remained.

Now, when the master plumber John Cataneo answers his phone, "I could write the script for nearly every caller," he said. " 'I'm boiling, I can't sleep at night, and the building isn't helpful.' "

In theory, steam heating is simple, efficient and easy to maintain. A boiler heats water to about 212 degrees. It becomes pressurized steam and races through a circuit of pipes. Some of the steam enters the radiators connected to the circuit. The steam transfers heat to the radiator's metal, which then warms the air of the room. This transfer causes the steam to cool, and it turns back into water, called condensate. The condensate returns to the boiler to repeat the cycle.

But a properly working steam heat system is a delicate balancing act. Numerous radiators are connected to a single source of steam. It is tricky getting the right amount of steam into each radiator when each may require a different quantity. Reducing steam in one room may send too much to a different room. "It's really simple," Mr. Holohan said, "but in practice, it's real easy to screw up."

Years of piecemeal repairs often lead to the banging, clanging and uneven heat so common in prewar buildings.

The steps needed to improve an overheated apartment depend on whether you have a one-pipe radiator system or a two-pipe.

In a two-pipe system, heat is moderated by a valve, which is an on-off knob that lets steam in. Valves are by nature adjustable.

In the more common one-pipe system, the heat is moderated by a vent, which looks like a miniature torpedo sticking off the end of the radiator and lets air out, to make room for steam to come in.

One potential fix is a vent that allows some control over how hot a radiator gets. “On a one-pipe system, an adjustable vent could be a very inexpensive answer; it’s a \$25 part,” said Hunter Botto, past president of the New York State Association of Plumbing Heating Cooling Contractors.

The cost of labor drives the price up, though. Expect to pay \$250 to \$750 for parts and installation of adjustable vents on each radiator, according to Paul Shay, a master plumber and heating consultant.

The problem with valves and adjustable vents is that they are easily misused. “People use the extremes,” Mr. Cataneo said. When people get chilly, they turn the valves all the way on until the room is too hot, then they turn them all the way off. Because of the mass of the radiator, he said, “there’s still a half-hour of heat left in that thing.” When the room eventually gets too cold, the process repeats. “It is best to set them and give them several hours to react to the adjustment,” Mr. Cataneo said. “These devices can provide a great deal of comfort — they just need time to work.”

These problems can be reduced by using a properly installed Thermostatic Radiator Valve, known in the trade as a TRV. These valves are fitted with a thermostat that turns the valve on or off automatically as room temperature dictates. The disadvantage is that TRVs are frequently installed improperly, plumbers said, and are less durable than the simpler manually adjustable valves.

There are also common steam heat problems that a TRV can’t fix. Steam systems mix metal pipes, water and air — a recipe for rust that can cripple valves and vents. If rust doesn’t get them, house painters are infamous for wrecking them with a coat of paint.

While apartment dwellers can try to manage their own heating situation, the preferred solution to overheating in New York apartments is whole system maintenance, which many landlords are loath to pay for, but New York City is taking

steps that may encourage upgrades.

Steam systems heat an estimated 70 percent of the large buildings in the city and are a leading energy waster. To deal with this energy inefficiency, New York City's Local Law 87 will eventually require 23,400 buildings of 50,000 square feet and larger to undergo an energy audit.

While the local law stops short of forcing landlords to overhaul heating, the energy audits will show how much can be saved through an upgrade, and will let landlords know what assistance may be available to help pay for upgrades.

The co-op board of 860 and 870 West 181st Street, a pair of brick prewar buildings in sight of the George Washington Bridge, didn't wait for a mandated energy audit to upgrade its heating. The building had an energy evaluation and applied for state funds in 2012 through the New York State Energy Research and Development Authority to update the building, including an overhaul of the steam heating system.

Engineers estimated savings from improvements to the heating plant — which included insulating the pipes and boiler as well as adding TRVs throughout the 126 units — at more than \$36,000 a year. The state authority provided \$63,000 for those and other upgrades, which helped defray the costs. And there is a payoff in comfort. “Having the TRVs where we can adjust our radiators, it's really great,” said Jane Maisel, a co-op board member and teacher. Over the years, Ms. Maisel and some of her neighbors had removed radiators to deal with their overheated apartments. “Now some people, like me, will probably have to put some back in,” she said.

As for Mr. Cox, he has a Brooklyn-based company, Radiator Labs, making and selling his Cozy radiator covers, which have been installed and studied in two buildings in Upper Manhattan. The Cozy works as an insulator, trapping the heat in a radiator, so it doesn't escape into a hot room. When a room cools, a fan on the Cozy circulates air so the radiator can heat the room. In the buildings tested so far, the Cozy has reduced heating costs by 24 percent to 33 percent, according to Radiator Labs.

For now, Cozies are available only for installations in entire buildings, in which case they cost about \$500 for each radiator. Each one has to be custom fitted for snugness by a trained technician, which makes them expensive to manufacture for an individual apartment. Mr. Cox is working to develop an adjustable model that could be mass produced to work on radiators of different sizes.

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