

PHOTO COURTESY OF RELIABLE AUTOMATIC SPRINKLER.

SPRINKLERS

A First Strike Against Fire

The **National Fire Protection Association** owes its origin to the fire sprinkler and, more specifically, to the desire of forward-looking insurers to standardize sprinkler design and installation. From this desire, NFPA's greater fire protection mission grew.

The history of the sprinkler—and, in fact, of all automatic suppression systems—began 173 years before the founding of the NFPA in 1896. Patented in England by Ambrose Godfrey, the first fire sprinkler system consisted of suspended casks of water to which chambers of gunpowder were attached. A rising fire would light fuses stretched between the casks, the gunpowder would blow apart the casks, and, with a hope and a prayer, the shower of water would put out the fire.

Sprinklers, the impetus for the beginnings of the NFPA, have grown in application. Tied with detectors, sprinklers are becoming more precise instruments of early fire suppression.

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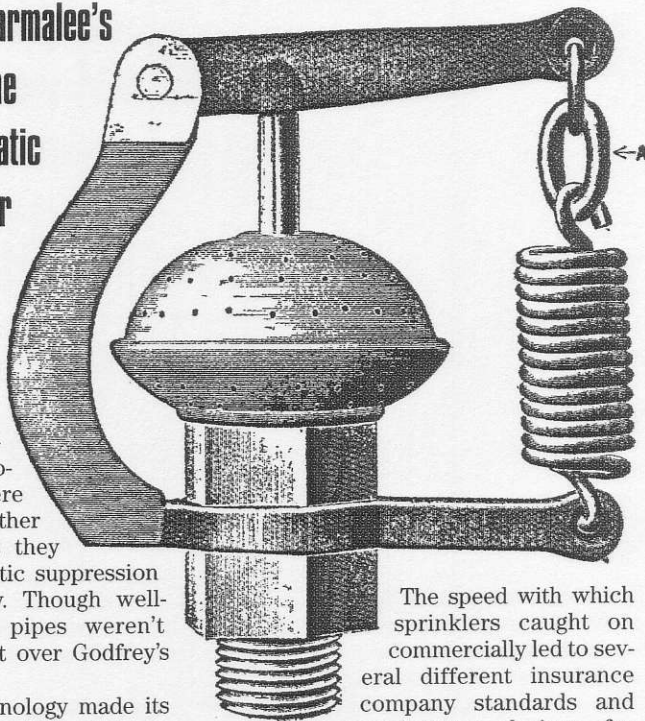
The first true sprinkler system to be installed in North America was a perforated pipe system, installed in a New England factory in 1852. Perforated pipe systems were eventually installed in other mills and factories, but they weren't the truly automatic suppression devices we know today. Though well-intentioned, perforated pipes weren't much of an improvement over Godfrey's exploding water barrels.

Modern sprinkler technology made its debut in 1874, when Henry Parmelee was awarded the first U.S. patent for an automatic sprinkler system. With its valve head held closed by a spring of fusible material, Parmalee's new sprinkler was the first practical automatic sprinkler invented for a wet-pipe system. Parmelee's sprinklers were installed extensively throughout New England in subsequent years.

New England's cold weather also led to the development of the first dry-pipe sprinkler system. Early attempts to keep sprinklers from freezing mainly consisted of adding antifreeze solutions to the regular wet-pipe systems. This was followed by the development of a mechanically operated valve that held water back from the sprinkler supply piping until the fusible cord keeping the valve closed was melted by the heat of a fire. At this point, water would rush into the system to douse the flames.

One such dry-pipe valve, the bellows differential dry valve, was patented in 1885 by Frederick Grinnell, the namesake of the Grinnell Corporation. This design, which used air pressure to hold water below the clapper, was the forerunner of the dry-pipe valves in use today.

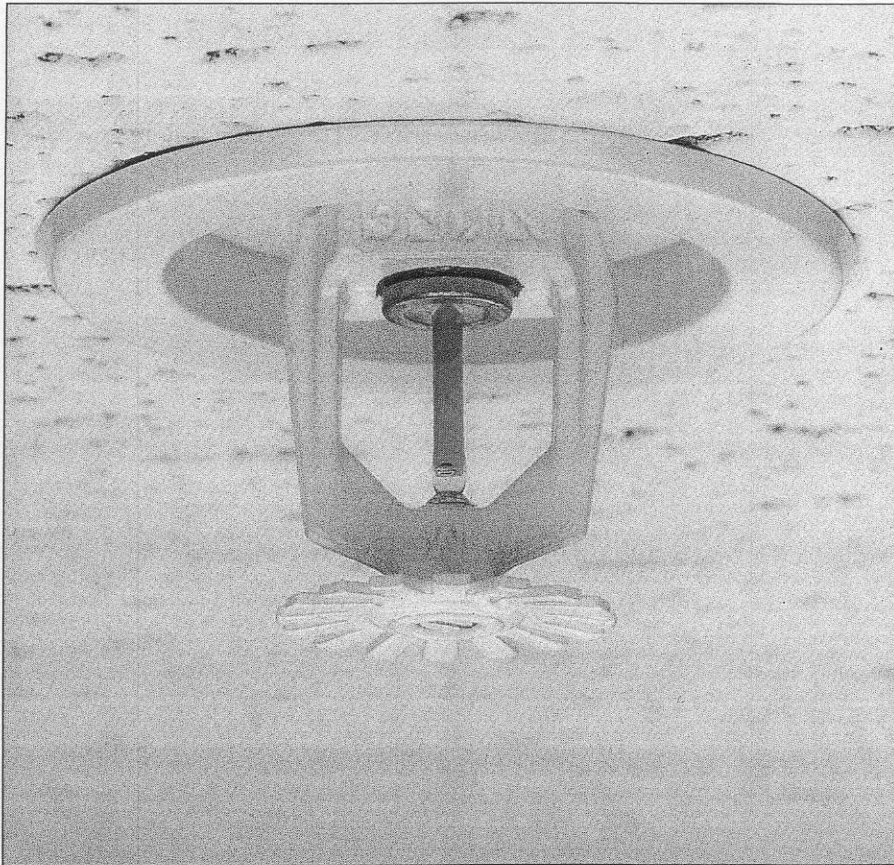
Another sprinkler pioneer was Charles Potter, founder of Potter Electric Signal Company in 1898. Potter, who was active in the NFPA, designed his own water flow alarm and sprinkler supervisory systems, which initiated an alarm when water pressure in the system decreased.



The speed with which sprinklers caught on commercially led to several different insurance company standards and manufacturer designs for sprinkler systems by the late 19th century. As many as 86 different types of automatic sprinkler heads were manufactured by more than 40 different manufacturers between 1878 and the early 1900s!

With the many different sprinklers came many different installation methods and standards, however. It soon became obvious to those representing fire insurance and sprinkler manufacturing interests that this "plumber's nightmare" had to be solved. So a group representing industrial underwriters and insurers, sprinkler companies, and inspection bureaus set out in 1895 to create uniform sprinkler rules.

Hosted by E. U. Crosby of the Underwriters Bureau of New England, attendees included Uberto C. Crosby, chairman of the Factory Improvement Committee of the New England Insurance Exchange; W. H. Stratton of the Factory Insurance Association; John R. Freeman of the Factory Mutual Fire Insurance Companies; Frederick Grinnell of the Providence Steam and Gas Pipe Company; and F. Eliot Cabot of the Boston Board of Fire Underwriters. No record of that meeting exists, but it appears from subsequent events that the insurance company representatives present were impressed with what Mr. Grinnell, a sprinkler pioneer, had to say about sprinkler performance. They were also impressed by the success the Factory Mutuals enjoyed underwriting sprinklered build-



VIKING CORPORATION

A long way from the Parmalee sprinkler, this one incorporates aesthetics as well as functionality into its design.

ings with more consistent sprinkler installation rules.

Cooperation and consensus finally led to the founding of the National Fire Protection Association and the first Standard for the Installation of Sprinkler Systems in 1896.

The first half of the 20th century saw the development of different fusible links that increased sprinkler response speed and of a number of other technological advances that made sprinklers more reliable.

In 1955, as a result of extensive research at Factory Mutual, the spray sprinkler deflector was modified to provide a more finely dispersed and more uniform downward pattern. These new sprinklers became known as the standard sprinklers, and the older models became the 'old-style' sprinklers.

Water damage has always been an issue with sprinklers, and to minimize it, the cycling valve was developed in 1967, and the on-off sprinkler was developed in 1972. According to Mike Bosma of Viking Corporation, cycling valves allow the riser of a preaction system to turn itself off after a protected area has cooled down, but allows the system to turn on again should the fire reignite, thereby providing effec-

tive protection while limiting water discharge.

Also developed were the single and double interlock systems. The double lock system prevents accidental water discharge by requiring that a detector operate and a sprinkler actuate before any water actually enters the system piping. Double interlock systems are used in areas highly sensitive to water damage, such as freezers and computer rooms. The single interlock system, also known as the supervised preaction system, is used in areas sensitive to water damage, too, but it has one lock instead of two. Water flows into the system piping after an electrical or pneumatic device is triggered, and water flows onto the fire after the sprinkler opens. This provides protection from false operation, while maintaining the speed of water application experience in wet-pipe systems.

These two types of sprinkler systems are similar. In the single interlock system, however, water flows into the piping after only one actuation—that is, detection. The double interlock system requires both an open sprinkler and a detector before water can enter the system.

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