AFD Ep 437 Links and Notes - Fire Alarm Telegraphy and the Great Boston Fire of 1872 [Bill/Rachel] - Recording Aug 14, 2022

- [Intro] We haven't really done any episodes on American firefighting, whether in big cities or in the vast remote forests, but we had a few ideas of some topics we wanted to cover in that arena. Today we'll be talking about early fire alarm systems and the Great Boston Fire of 1872, 150 years ago this November, which really put them to the test under difficult conditions. Major urban fires were a recurring and devastating feature of city life in the 19th century United States, just as they had been in earlier eras, but now they were beginning to meet the modern form of the Second Industrial Revolution city with its new technologies and taller buildings. Yes, Boston alone had experienced major fires in 1711, 1747, 1761, 1787, and 1794 in the 18th century alone, according to *Boston: A Topographical History* by Walter Muir Whitehall. However, the November 1872 fire in Boston was a notable meeting of the old and the new in many different ways, some of which helped and some of which made the situation more difficult.
- For one thing, the building where the fire began was six stories tall and rapidly became a towering inferno due to its elevator shaft, something we recently talked about on our June 2022 episode about the emergence of elevator buildings in this period. When that initial building collapsed, it rained burning debris onto many of the neighboring buildings, including some with newer tar-based roofing, something we touched on a bit in our asphalt bonus episode focusing on the same period. (*Boston Observed*, by Carl Seaburg, 1971, p. 137) The entire block was burning within 5 minutes of the first passer-by realizing there was a fire. That area of the city would burn for 18 hours before being contained and would still be sporadically causing new problems for a while longer. 776 buildings were lost, even though more than 700 of those were brick or stone. (Seaburg, p.141) These had been assumed to be fireproof, but that did not account for all the paper and other flammable materials stored inside them, nor for the vulnerable roofs. (*Boston Ways: High, By, and Folk* by George F. Weston Jr, 1957, p. 132) Including intentionally detonated blocks to create fire breaks, 65 acres of mostly commercial land, encompassing nearly 1000 businesses, were leveled. The death toll estimates ranged from a dozen or so to a couple dozen or more. (Seaburg, pp.141-142). Let's talk now about some of the specific notable features of this fire and the response to it.
- [Rachel] Mid-19th Century Fire Alarm Telegraphy (featuring Gamewell of Newton Upper Falls! Boston had been the first to experiment with fire alarm telegraph networks)
    - From Gamewell's Corporate History:
        - In 1852, Dr. William Channing and Moses Farmer of Boston developed the first practical telegraphic fire alarm system that could communicate the presence of fire and also the location of the fire. In 1854, they sought a patent for the "Electromagnetic Fire Alarm Telegraph for Cities". In 1855, John N. Gamewell, a South Carolina postmaster and telegraph company agent, attended a lecture on the alarm system at the Smithsonian Institution. Later that year, he purchased the regional rights to market the system in the South and Southeastern states. In 1859, Gamewell purchased the total rights to the Channing and Farmer system. In 1865, after the Civil War, the US government seized the Fire Alarm Telegraph patents and auctioned them off. In 1867, John F. Kennard of Boston bought the patents and returned them to Gamewell, and formed a partnership. Kennard and Company set up shop in Newton Upper Falls, MA, to manufacture the fire alarm telegraph systems. A decade later, in 1879, Gamewell established the Gamewell Fire Alarm Telegraph Company. By 1886, Gamewell systems were installed in 250 cities in the

US and Canada, growing to 500 cities by 1890, with a new factory opening in Newton Upper Falls.
    - These alarm boxes worked to alert the fire department to the presence and location of a fire by sending a telegraphic signal that corresponded to the box number. When activated, by turning a knob or pulling a hook, a spring-loaded wheel turns that sends the signal. A receiver at the fire station would indicate that an alarm was active with flashing lights or sounds, or via a pen recorder, and the signal would be matched up to a box number and location of the box. In later iterations, the translation would be automated to speed up the process, and in some unmanned installations, the box number would be transmitted via public address.
    - Oops, the fire alarm telegraphy system failed for human reasons instead of technological reasons:
        - It's not great to lock up the safety equipment to prevent false alarms! But this was indeed the system employed at the time of the fire in 1872. When a fire was spotted, residents were supposed to report to a designated block captain type figure who would have access to a key to open the nearest fire alarm telegraph box and activate the alarm. Even then the alarm activation required a complicated cranking. (Seaburg, p.136) Unfortunately some of these designated people were not immediately available, delaying the response time significantly and allowing the fire to spread much farther before any attempt to mobilize firefighters was made at all.
        - In later installations, some sort of nuisance was added to the alarm boxes to prevent false alarms. A shrill noise would sound when the box was opened, or the box would handcuff a detachable part of the alarm system to the person sounding the alarm, to make them easily identifiable to investigators.
        - https://en.wikipedia.org/wiki/Great_Boston_Fire_of_1872#Fire_alarm_boxes
- Great Boston Fire of November 1872 (Nov 9-10) https://en.wikipedia.org/wiki/Great_Boston_Fire_of_1872
    - On the other hand, there were a lot of other factors working against any kind of rapid firefighting response in Boston, even if the fire alarm boxes had been readily accessible, and it is unclear how much a faster alert time would have mattered in terms of producing a faster actual response on November 9.
    - Back on October 1, 1872, the 1872 North American outbreak of Equine Influenza had begun in Toronto. This devastated all horse-based transportation in many parts of Canada and the northern United States, though not infecting humans. Fortunately, infected horses overwhelmingly survived, but while they were sick, they were often too sick to stand, which brought everything to a halt. A year ago in August 2021, we did an entire Horse Power episode (#392) about the extent to which pre-automobile cities in the US depended on massive numbers of horses to get anything done. Unsurprisingly, therefore, when the Equine Influenza struck, there were enormous problems for months as it gradually swept around the cities of the northern United States in a big arc from Ontario back around to British Columbia. There's an extremely clear and concise write-up of the 1872-73 outbreak in the Wikipedia article on Equine Influenza, discussing the spread patterns and the rapid forced shutdown of street railways, freight deliveries, Erie Canal transportation, and more: https://en.wikipedia.org/wiki/Equine_influenza#1872_North_American_outbreak

    - The good news (besides the high survival rate for infected horses) was that an affected community would only be hit for a couple weeks typically, even as it was slowly spreading to nearby communities, and the horses would be back to full strength again after several more months. But it just so happened that in Boston specifically, this influenza temporarily incapacitating horses was still near its peak on November 9 & 10 1872, during the Great Boston Fire. And the result there was that there were simply no horses available to pull firefighting equipment. In the days leading up to the fire, according to Carl Seaburg's *Boston Observed*, city officials had made the smart decision to hire temporary firefighters, enough to double the existing force, just in case there were to be a major fire with no horses available (p.137). Crews therefore began pulling their equipment by hand to the fire. Remarkably, the official post-fire commission report found that this only delayed crews by a few minutes once they had been summoned, but it did prompt the city to begin investing in steam-powered equipment, similar to self-propelled tractors, to avoid this potential problem in the future.
- Even when the hand-pulled fire trucks arrived on the scene, the city's water pressure proved to be really bad for trying to fight the fire. We're planning a separate episode on 19th century public waterworks, but it's enough to note here that many of those projects (like the Cochituate Aqueduct system from the 1840s) were now already quite antiquated in Boston by the start of the 1870s and the water pressure simply hadn't been increased to match rising building heights of the post-Civil War period and the growing number of elevator-equipped buildings. Moreover, lack of standardization meant some firefighting equipment did not actually match the nearby fire hydrants.
- Most of the fire suppression had to be done with the support of outside steam-powered water pump vehicles brought in from all over New England as fast as possible. Within an hour of the blaze being spotted, the Boston Fire Chief had already asked every town within 50 miles by telegraph to send anything they could immediately. (Seaburg, p. 140)
- Another discovery Boston made about the modern American city of the 1870s was that gas street lighting turned out to be extremely bad for fire control. This did lead to a few specific explosions during the 1872 fire, but mostly the city simply had to switch off the entire gas infrastructure, leaving Boston in nearly total darkness for some nights while the fire was contained and suppressed, and until the demolished areas could be disconnected from the rest of the network. (Stark's *Antique Views of the Town of Boston*, p.378)
- [Rachel] One failed tactic that was attempted was the use of gunpowder to raze buildings in the path of the fire to create firebreaks. Mayor William Gaston approved the use of gunpowder and citizens began packing buildings full of kegs of gunpowder. Unfortunately, the gunpowder was not effective at creating firebreaks and the primary effect was great injury to civilians and flinging flaming debris at surrounding buildings. Chief Engineer John Damrell was forced to put a stop to the use of gunpowder.
- [Rachel] Many notable buildings were destroyed in the fire, including the Boston Globe and Boston Herald offices, as well as Trinity Church, an Anglican church from the colonial era. The Old South Church was one of the few buildings left standing in the district. Over-insurance of buildings was common at this time, so many businesses had the money to immediately begin rebuilding. Another major part of the rebuilding process was improvements to the roads, both straightening

and widening. Congress Street, Federal Street, Purchase Street, and Hawley Street were widened. Within two years, Boston's entire financial district was rebuilt.

- [Rachel] During the period of rebuilding, land values in the financial district rose dramatically, fuelled by the significant improvements to the infrastructure and to the new buildings. Also, some plots of land were consolidated into larger, more valuable parcels.
    - "Although this calamity was a fearful blow to the business interests of Boston, entailing any amount of misery and distress, it however soon recovered from the shock, and with its usual pluck, refusing all proffered outside aid, has now covered the burnt district with some of the most imposing and substantial business warehouses, which are an ornament to the city." (Stark's *Antique Views of the Town of Boston*, p.378, from 1907)
    - Mark Twain wrote "The 'burnt district' of Boston was commonplace before the fire, but now there is no commercial district in any city in the world that can surpass it – or perhaps rival it – in beauty, elegance and tastefulness." (quoted in *Boston Ways: High, By, and Folk* by George F. Weston Jr, 1957, p. 132, from *Life on the Mississippi*)
- [Rachel] Chief Engineer Damrell resigned from the Boston Fire Department in 1874 in the wake of investigations into the fire by the Fire Commission. That same year, Boston began replacing and repairing its water mains, one of Damrell's pet causes. (An additional new aqueduct project was also begun.) Although he resigned from his position, Damrell remained devoted to firefighting and public safety. *In 1873, he founded the National Association of Fire Engineers (NAFE, now called the International Association of Fire Chiefs, IAFC) and became the organization's first president. He also served as a building inspector for the city of Boston.*
- [Rachel] While Damrell was president of NAFE, they published a list of fire safety concerns in building construction.
    - Flammable and combustible building materials
    - Excessive height buildings, beyond the reach of ground ladders
    - Fire escapes
    - Water supply
    - Space between buildings
    - Corridors and open stairways
    - Fire alarms
    - Fire department
- [Rachel] *In 1877, Damrell was appointed Boston's building commissioner. He served the Department of Building Inspection for 25 years. In 1884, Damrell petitioned the National Association of Fire Engineers to create a more formalized building code during his presentation of* Building Code Report *at a NAFE convention. In 1891, The National Association of Commissioners and Inspectors of Public Buildings (NACIPB) was established by Damrell, and he served as the first president. A standardized building code wasn't established until 1905, the year of Damrell's death, when the National Board of Fire Underwriters published its* National Building Code*.*