



The Development of the Electric Fire Alarm System

By L. E. Lowry *

The fact has always been recognized in connection with municipal fire protection that neither the most thoroughly equipped department nor the most ample supply of water is of any avail until the existence and location of a fire are made known. It is natural, therefore, that side by side with the development in methods for fighting fire will be found improvement in the means used for transmitting alarms of fire from the section threatened to the location of the fire fighting apparatus.

The first regular fire alarm telegraph system in the United States was that adopted by the city of Boston in 1852, and on the 29th of April in that year the initial alarm was electrically transmitted from the central office in that city to the nineteen tower bells scattered about the city on which this alarm was sounded. Previous to this (in 1850) the Morse telegraph had been used in New York to signal the existence of fires, but Boston was the first city to install a complete special system for fire alarm purposes.

Following Boston's example, Philadelphia installed a fire alarm system in 1855, and St. Louis, New Orleans and Baltimore followed in 1858 and 1860. Since that time the adoption of electric fire alarm systems has been steady, until at the present time over one thousand cities and towns have installed fire alarm telegraph systems.

The original system as installed in Boston was adapted only to large cities which could afford to employ a corps of day and night operators to receive and transmit alarms to maintain the integrity of the

electrical circuits and the apparatus. It was not until the invention of the automatic repeater in 1870 that the fire alarm telegraph was brought within the reach of the smaller cities and towns. This invention made it practicable to strike all the bells and gongs of the alarm system directly from the street signal boxes and without the intervention of an operator in the central office.

For ease and reliability of operation, boxes and alarm apparatus were distributed over a number of independent lines or circuits. Later, improvements were made to prevent interference between two alarms sent in over different circuits at or about the same time.

The first signal boxes used in the Boston system depended in their operation upon the turning of a crank by hand, and it was claimed and generally believed at the time that almost any one could do it correctly. Experience proved otherwise: it was soon found that in the turning of the cranks on these boxes the parties sending in the alarms would be so much excited that they would generally turn the cranks too rapidly, and it was always difficult and sometimes impossible for the operators at the central office to make out the signals, which were recorded in dots and dashes on a Morse register at the central office. The addition of the automatic box was, therefore, most gladly hailed by all those who were struggling with this very uncertain means of transmitting definite signals.

It is difficult at the present time to understand many of the objections and prejudices which had to be overcome in securing the general establishment of the electric fire alarm system, but this can be well un-

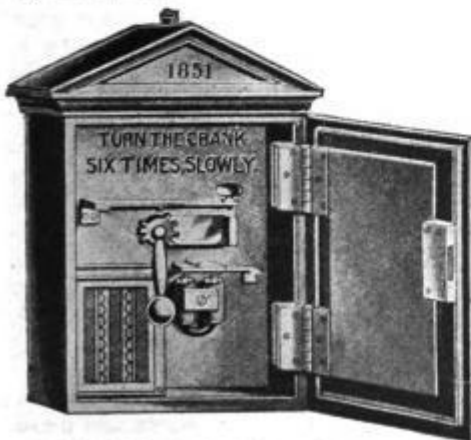
* With the Gamewell Fire Alarm Telegraph Company.

derstood when it is remembered that the first steam fire engine used in Boston was bitterly opposed by the men connected with the department, and was stored away and allowed to rust and go to pieces.

The first patent on an automatic signal box operated by a pull to be freed from the mechanism after the pull is made was taken out in 1867, but careless, inexperienced or designing persons could still interfere with these boxes while transmitting a signal, and it was not until about two years later than this difficulty was overcome by a new device known as the "Non-Interference Pull," by the use of which when a box was once started this signal could not be interfered with by pulling the box again before the signal was completed.

The next step in advance was made when the non-interference principles were applied to the transmission of signals and signaling boxes were so arranged that although two or more boxes were operated at or about the same instant no confusion of signals would result, a complete and definite signal being transmitted by one of the boxes so operated. Later, successive features were introduced into the boxes by means of which a number of boxes might be operated simultaneously without the loss of an alarm from any box.

The positive non-interfering and successive type of fire alarm box represents the highest development of the art of fire alarm telegraphy and is rapidly being adopted by nearly all the municipalities in this country and abroad.



ORIGINAL FIRE ALARM BOX WITH CRANK
TURN AS FIRST USED IN BOSTON



INSIDE MECHANISM OF A MODERN
FIRE ALARM BOX

Soon after the introduction of the automatic box and the automatic repeater (which made the system available for use in comparatively small cities), the principle was made useful in central office systems by the introduction of a so-called "joker" system, invented by Prof. Garrett, for so many years the Superintendent of the Bureau of Electricity of Chicago. This joker plan, patented in 1876, permitted alarms to go directly from the signal boxes to those fire companies which are expected to respond to fire alarms. Improvements have been made combining this plan with an automatic repeater, so that now it is considered more important than ever in the equipment of central offices.

Besides the joker system, many other improvements have been made in central office equipments. These modern equipments involve some extremely ingenious devices and the most careful and perfect mechanism ever produced. The great importance of having everything pertaining to these central office equipments for large cities as perfect as possible will be apparent when attention is called to the fact that according to a recent report, New York had 9,327 alarms of fire in one year. In the same year Philadelphia had 3,190; St. Louis, 3,894; Boston, 1,681; Baltimore, 1,612; and other cities in proportion to their size and population.

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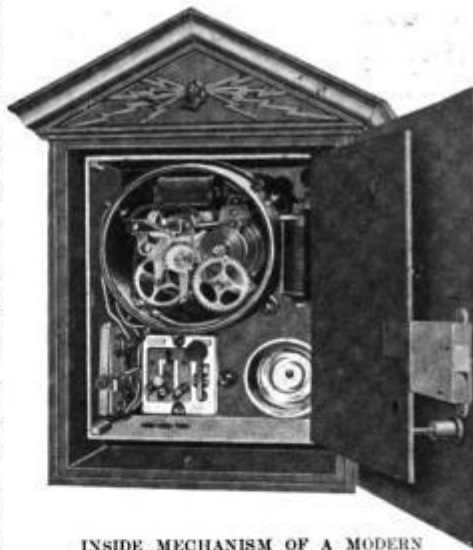
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CENTRAL OFFICE OF THE FIRE ALARM SYSTEM AT NEWARK, N. J.
The most complete installation of its kind in the world

To save delay in the sending of alarms from the street boxes, occasioned by the failure to find the key readily, and in order to prevent false alarms, the keyless door was invented. By this device the door could be opened by the turning of a handle. This handle wound a spring which set in motion mechanism by which a local alarm was sounded on a small gong within the box. This was intended to deter maliciously disposed persons from meddling with the box or turning in false alarms.

Until recent years nothing was used to any extent to generate electric currents for fire telegraph, except galvanic batteries of the gravity form. Within a few years, however, an important advance step was taken by the introduction of the storage battery. The very general use of electricity for light and power during the last few years has made it possible and practicable to obtain from electric light and power companies all the electric power needed for fire telegraph purposes at a minimum of cost, and comparatively recent inventions have made its application and use easy, economical, reliable and safe.

Specially constructed switchboards have been provided for charging and discharging the storage batteries, and these boards are provided with every device needed to insure perfect and reliable operation. Notwithstanding the great superiority and convenience of this battery over the old gravity battery, it can be maintained at about half the cost.

In connection with the regular municipal systems for fire alarm telegraph, it is important to call attention to what is known as the "auxiliary" system intended as an aid to the regular system in giving prompt direct alarms to fire departments from the interior of buildings. This is an important improvement towards more prompt transmission of alarms of fire.

The successful use and greatest value of the fire alarm telegraph have been demonstrated through municipal ownership. It is even suggested by many at the present time that the means for giving alarms from the interior of buildings should be furnished by municipalities and paid for by those desiring the added protection afforded, just as water is furnished.

