



## When Were Lightning Arresters First Used

### And The Origin of the Term Lightning Arrester

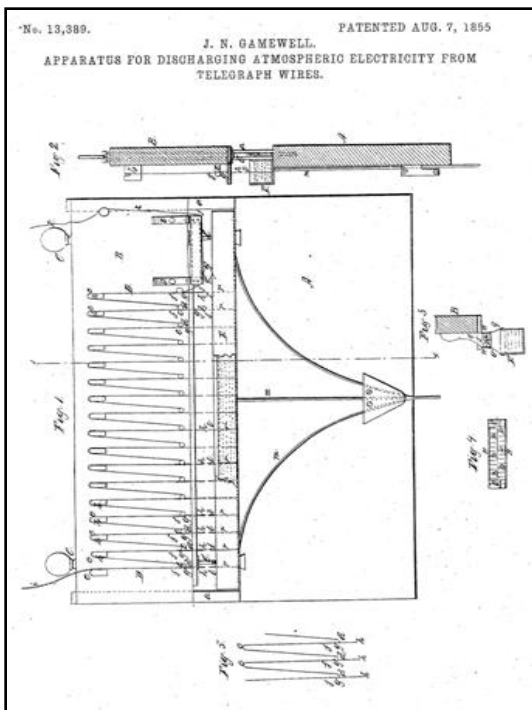
Jonathan Woodworth

September 6, 2008

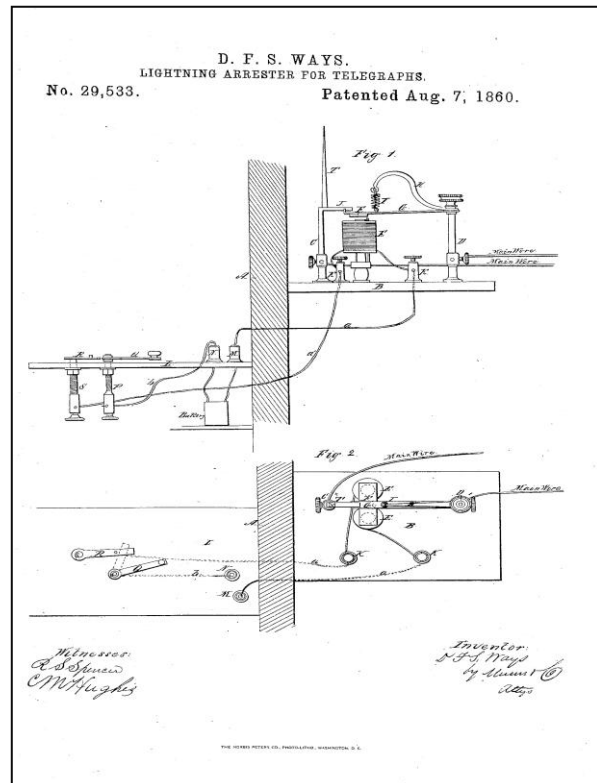
Whenever I ask power engineers when they think arresters were first used, they will contemplate for a moment and say "It had to be about 1890 when the first power systems started to appear around the country." At first they don't believe me when I tell them they are only off by 40 years. I can tell they are thinking, "That can't be." When I tell them lightning arresters precede power systems they are almost indigent. "Ok, what's the catch" they say, "is this a trick question?" That's when I smile and say "Over voltage surges didn't start with power systems. Lightning arresters were used on telegraph systems long before the light bulb

became the reason for power systems." Although I know arresters preceded power systems, I am sorry to say that I have not yet found the exact origins of the lightning arrester. However I have made some nice progress on this subject during the past month that I would like to share.

The earliest reference in a US patent to the term lightning arrester shows up in [patent 29,533](#) that was issued on August 7, 1860 granted to D.F.S Ways.



First US patent relative to lightning protection of telegraph systems ([13,389 1855](#))



First US Patent that uses the term "Lightning Arrester" ([29,533 1860](#))

# ArresterHistory

ArresterWorks.com



However, [US Patent 13,389](#) also issued on August 7<sup>th</sup>, but 5 years earlier in 1855, refers to a protective device called an Apparatus for Discharging Atmospheric Electricity from Telegraph Wires. In this patent, granted to J.N. Gamewell, it is implied that this is an improvement on other devices. This apparatus is quite complex and although the term lightning arrester is not used it is an arrester and it is obviously not the first design of an overvoltage protective device.

An excellent find this past month was an [historic sketch written in 1852 by Alexander Jones](#) on the Electric Telegraph. In this document he states that “Interference from Atmospheric Electric Discharges has been greatly reduced as of late by the use of Lightning Arresters.” This is the earliest reference to the term lightning arrester that I have been able to uncover.

18. Interruptions from atmospheric electricity have been greatly reduced of late, and it is confidently expected that they will, at no distant day, be entirely overcome. One of the means used at present is, by putting on a lightning arrester near to the recording instrument. This arrester is formed of a little glass globe, surrounded by a semicircle of small points, like needles, that approach quite close to the ball. These points carry off the lightning to the earth before it reaches the instrument, causing but a momentary interruption. The diminution of interruptions by thunder-storms has been reduced thirty per cent. by this means alone. Other causes of interruption are accidental,—trees, &c., falling on the wire and snapping it.

[1852 Use of the term Lightning Arrester. \(In an historical sketch of the Telegraph\)](#)

## Paper on Lightning Induction

In 1847 the concept of a spark gap as an arrester for telegraph systems is disclosed in an [excellent article](#) written on the subject of induction into telegraph lines from atmospheric discharges by the famous Professor Joseph Henry. The Joseph Henry who 16 years earlier had made the fundamental

discoveries of induction that lead to the development and invention of the telegraph. Could this be the first written description of an early lightning arrester even though the term arrester was not mentioned?

If this is so, then one could deduce that if Professor Henry did not mention the term arrester in 1847, yet it appeared in an 1852 document that implied it was a new device, the term arrester relative to

[1847 Paper by Joseph Henry](#) that discusses lightning protection using a gap. Does not use term arrester

*on the Wires of the Electric Telegraph.*

31

gles to the spires; and such was its intensity and quantity, that all the wires across which it passed were melted at points in the same straight line as if they had been cut in two by a sharp knife.

The effects of the powerful discharges from the clouds may be prevented in a great degree, by erecting at intervals along the line, and aside of the supporting poles, a metallic wire, connected with the earth at the lower end, and terminating above at the distance of about half an inch from the wire of the telegraph. By this arrangement the insulation of the conductor will not be interfered with, while the greater portion of the charge will be drawn off. I think this precaution of great importance at places where the line crosses a river, and is supported on high poles. Also in the vicinity of the office of the telegraph, where a discharge, falling on the wire near the station, might send a current into the house of sufficient quantity to produce serious accidents. The fate of Prof. Richman, of St. Petersburg, should be recollected, who was killed by a flash from a small wire, which entered his house from an elevated pole, while he was experimenting on atmospheric electricity.

lighting must have come into existence between 1847 and 1852. The quest continues.....

## Potential Origin of the term “Lightning Arrester”

The term Spark Arrester was a well used term common in the middle 1800’s but it referred to a chamber that was installed on wood burning and coal burning train engines to reduce the potential of sparks escaping from the stack and setting the country side on fire. I have to wonder if the term lightning arrester is somehow related to this mechanical device.



## Early US Patent on Lightning Arresters

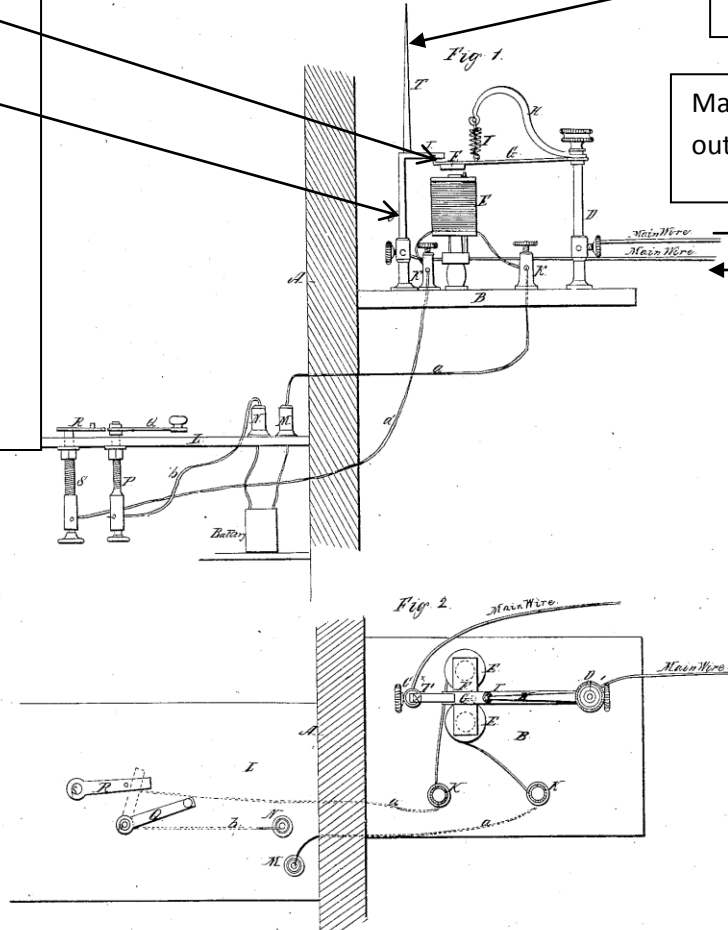
Patent 29,533, Dated August 7, 1860 is the first reference in US Patents to the term Lightning Arrester. Before this, the term Atmospheric Electricity Discharger was used.

D. F. S. WAYS.  
LIGHTNING ARRESTER FOR TELEGRAPHS.  
No. 29,533. Patented Aug. 7, 1860.

Contact F J/F is operated by Solenoid E  
opens or closes contact J-F with Switch inside the building.  
No grounds involved, just an open circuit.

This rod gives the lightning a place to go.

Main Telegraph Wires in and out of the Building.



Witnesses:  
A. S. Spence  
C. M. Hughes

Inventor:  
D. F. S. Ways  
by Munnist  
Atty

THE HORNER PETERS CO. PHOTO-LITHO. WASHINGTON, D. C.