



## The Bennett Arrester Story

By Jonathan Woodworth 2008

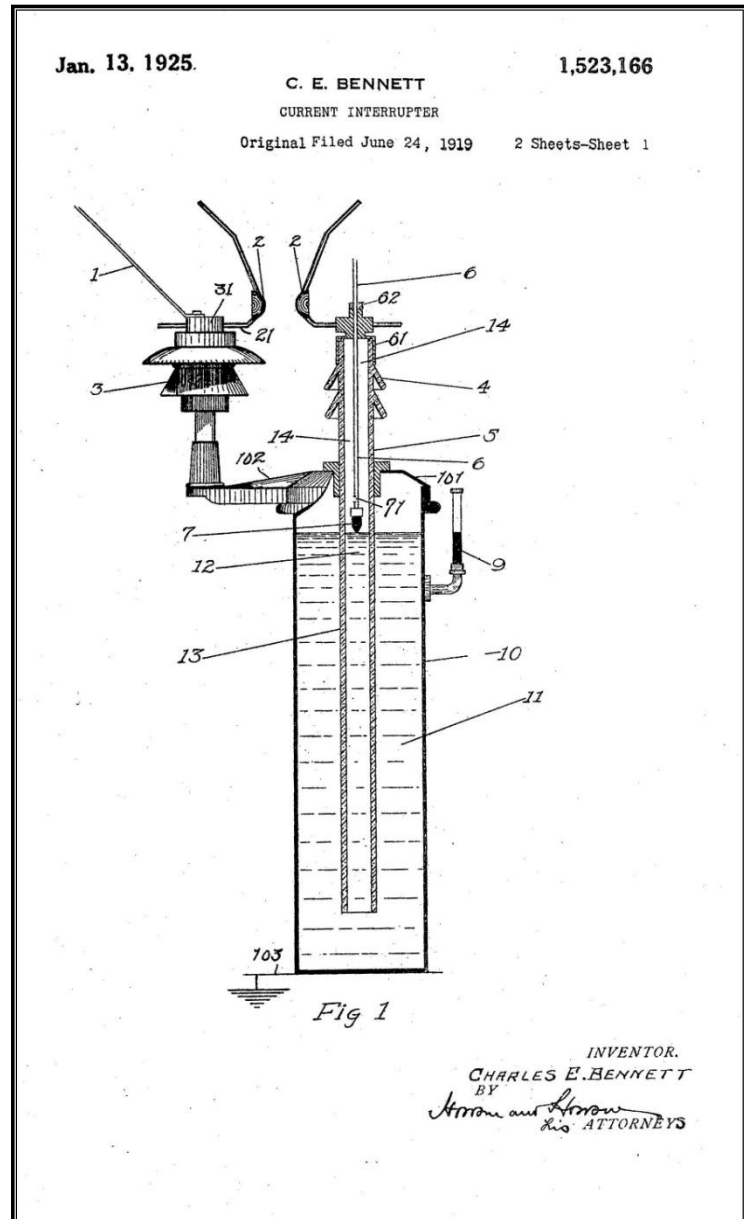
### Charles E Bennett the Inventor

While Elmer Creighton, the lead arrester design engineer at GE was hard at work developing the electrolytic arrester in 1908, Charles E Bennett was perhaps just learning what an arrester was. We first run into CE Bennett in 1919 when he applied for his first patent.

Bennett's first patent had a co-inventor by the name of Marshall Maxwell. Maxwell on the other hand was not new to patents, he was issued his first patent in 1911. So, for Bennett's debut into the patent and arrester world, it would appear he had a mentor.

Patent 1,359,222 was issued in November 1920, just a quick 1.5 years from its initial application. This patent was titled "Current Interrupter for Electric Circuits". It was in actuality a choke in parallel with a gap connected to ground. It had no resistance in series with the gap so in effect it was a modified arc gap arrester.

Bennett did not waste any time though until his next patent. He had 4 more patents in quick succession between his first and the one he is most famous for, the "1925 Bennett Arrester." Each of these 4 patents pertained to arresters. From 1919 to 1925 he remained employed by the



Baltimore Manufacturing Company with a Georgia address.

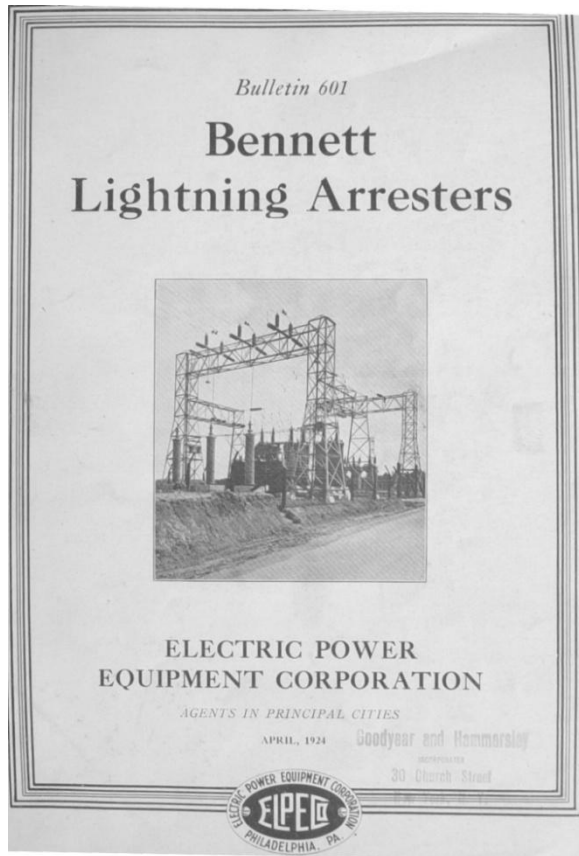


Figure 2 Bennett Arrester Bulletin

However, it looks like the Electric Power Equipment Company of Philadelphia assumed the production and distribution rights to “The Bennett Arrester. This conclusion comes from an April 1924 Bulletin titled “ Bennett Lightning Arresters” where the vaporizable electrode type arrester was introduced. In this Bulletin, it states that “ Now and hence forth produced exclusively by Electric Power Equipment Corporation.” This new type of arrester is very

different from earlier models of arresters, and very simple in form. See Figure 1 for the patent.

### Theory of Operation

At the instant of discharge the current spans the arc-gap that is external to the arrester and is carried directly down the electrode rod through the carbon electrode to the solution column inside the bushing. This solution column offers a non-inductive path through which the high voltage discharge is carried directly to the ground connection.

When the dynamic current (power frequency current) follows a discharge across the gap, the resistance of the solution in the tube is sufficient to prevent an undesirable heavy flow of dynamic current to ground.

As the discharge continues, the solution in contact with the carbon electrode becomes rapidly vaporized and sufficient pressure is developed to press the solution column downward inside the porcelain tube, the space formerly occupied by the solution being taken up by a conducting vapor of much higher resistance.

When enough vapor has been interposed in its path, the current is so reduced in value that the arc at the outside gap cannot be maintained and the current flow ceases.



## Details of Construction Bennett Lightning Arresters

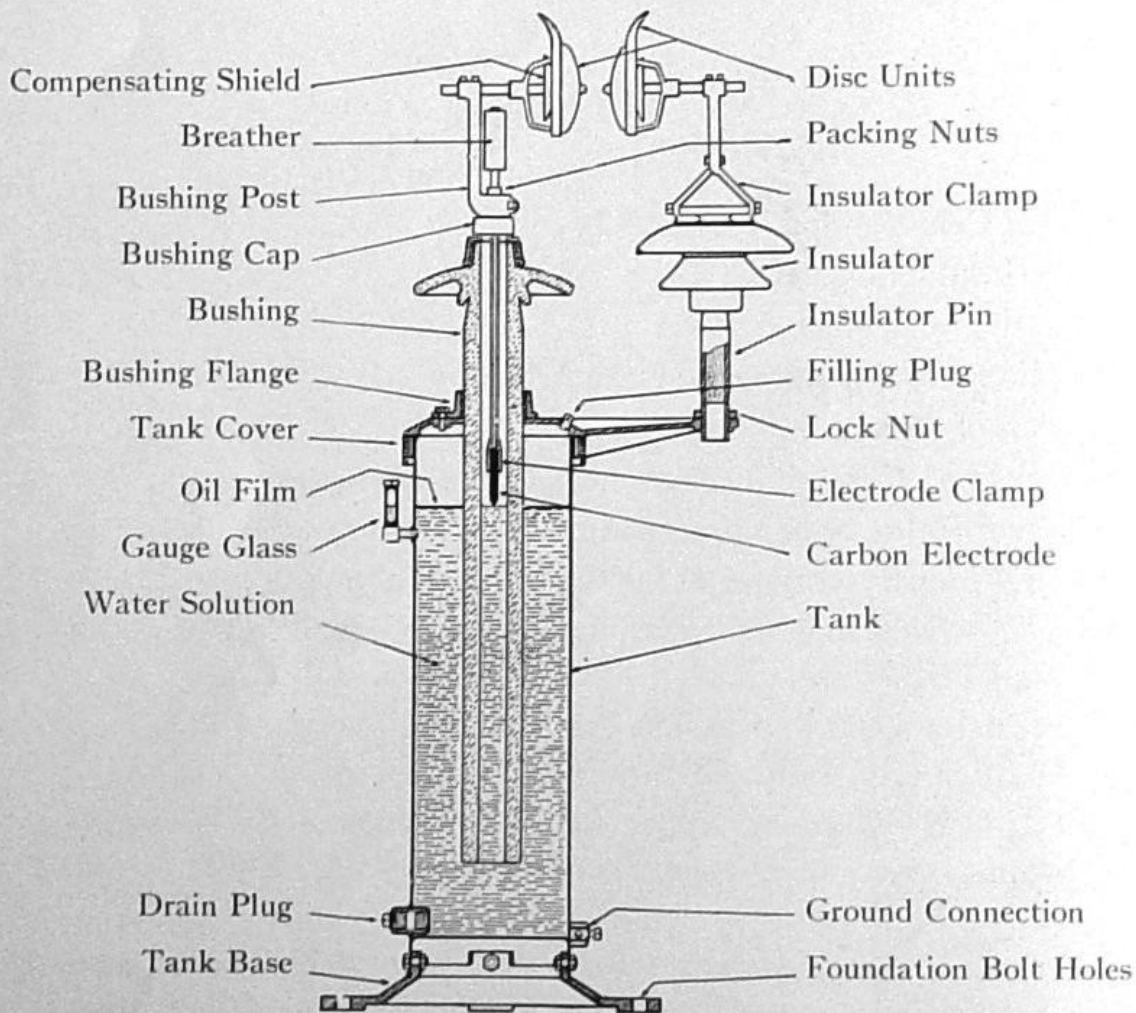


Figure 1  
Cross Section of D-24 Bennett Arrester

Figure 3 Bennett Arrester Details

### Later Designs

In 1929 CE Bennett was granted the last of his arrester patents. It was a modular

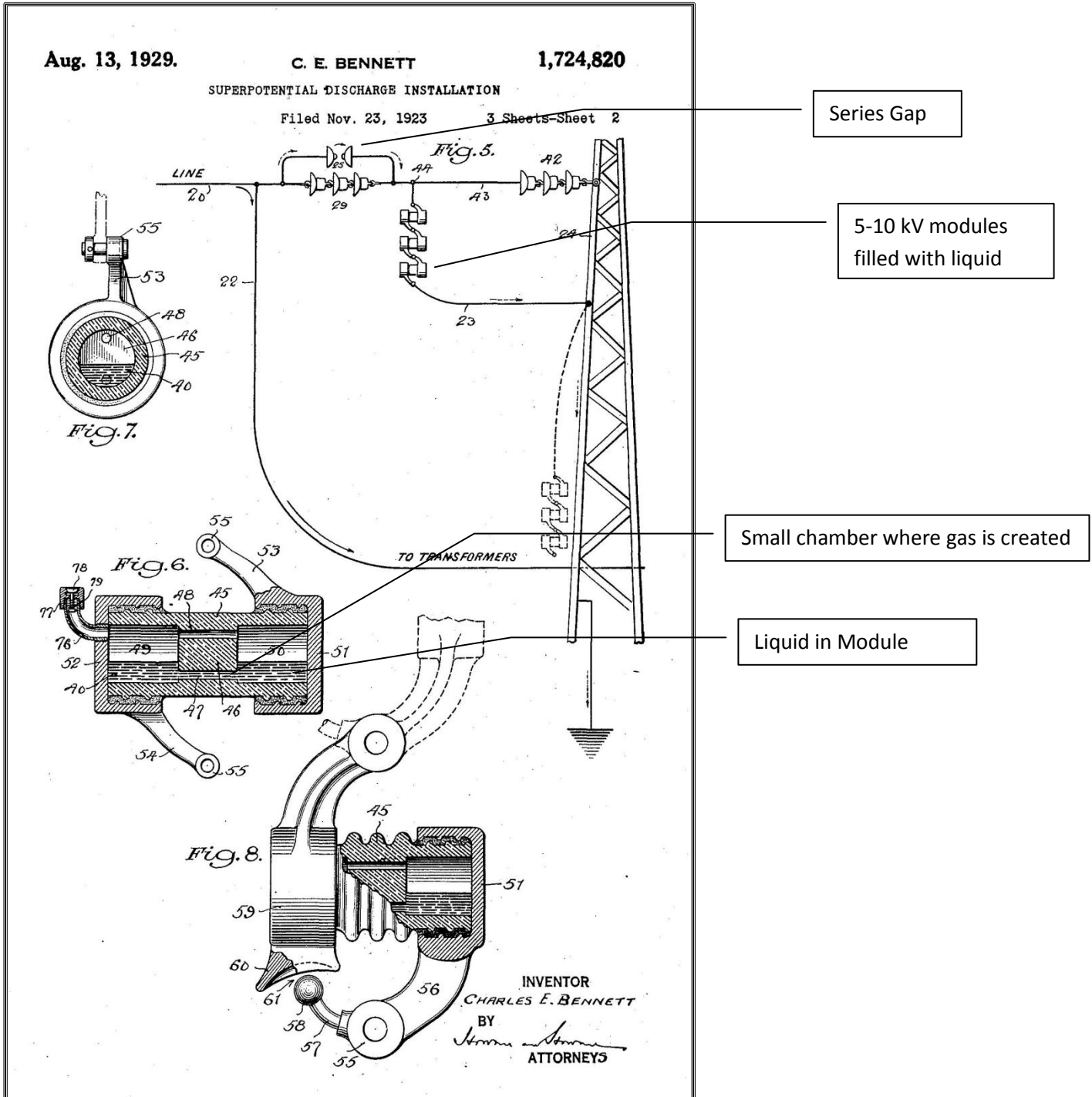
configuration of the liquid filled arrester. This configuration allowed the user of the arrester

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to build any voltage rating they wished in the field. See Figure 4 for more details.



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There is no indication about the success of this arrester type. Its era was likely ended with the introduction of the Silicon Carbide Arrester in the late 20's. There is also no indication as to what happened to the Philadelphia Power Equipment Manufacturing Company.

There is no real detail about the liquid used in these arresters. Obviously if they were used in areas north of Florida, there would have to be some additive to the water to keep them from freezing

A Charles E Bennett appears in patent databases from 1932 to 1948 working for the Okonite Company in New Jersey designing underground cables. I have to wonder if this is the same person but that is another story for another day.

Reverences

[The 1924 Bennett Arrester Bulletin](#)

[The Original 1925 Bennett Arrester Patent](#)

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