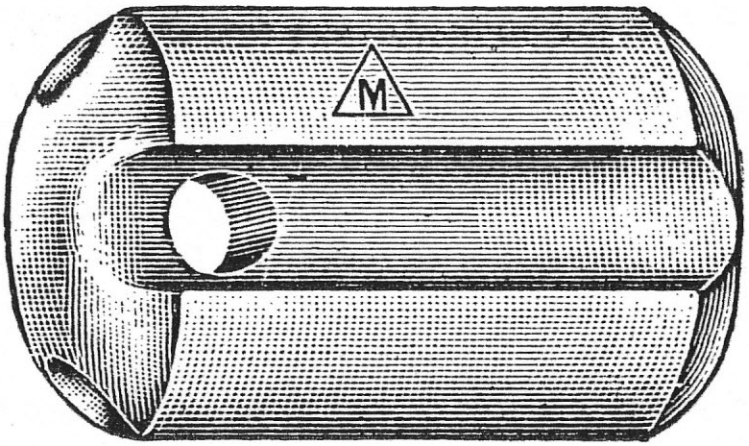
Old Familiar Strains

a newsletter for collectors of radio strain insulators and related items

Volume 6 No. 4/5 **October 1999**

Illinois Porcelain Strain Insulators



No. 500 dry process; No. 502, 504 and 506 wet process.

Cat. No.	Ht. In.	Diam. In.	Hole In.	Groove In.	Number per Bbl.	Wt., Lbs. per Bbl.	Price per 1000
500	2 1/4	1 1/2	5/16	3/8	1600	450	**$210.00**
502	3	2 3/8	3/8	9/16	400	440	**420.00**
504	3 1/2	2 7/8	1/2	11/16	250	450	**525.00**
506	5 1/2	3 3/8	3/4	7/8	140	480	**1000.00**

2016 PDF edition

Pyrex Update

by Dan Howard

A couple of interesting Pyrex items came my way recently and I figured that (another) Pyrex update was warranted.

Part I – A Tale of Three Boxes

This summer I was able to acquire one of the orange Corning insulator boxes like the one shown on page 5 of the April issue. Having the chance to consider it along side the gray and red boxes, I began wondering which was the oldest. Though we've shown them separately in the past[1], I've copied the three boxes side-by-side on the next page so that you can follow along and compare for yourself.

1. First - The Orange Box

I suspect that, of the three, the orange box is probably the oldest. In 1919, Corning was granted patent # 1,304,623 for its glass. Ten years later, in 1929, the company was granted the familiar glass insulator patent #1,700,066. I'm sure that you've seen the later number – the company embossed it on its strains for years. The later patent, an abstract of which was printed in the April, 1998 issue, dealt with the use of Pyrex glass in high frequency radio insulators. The earlier patent dealt with the composition of glass.[2]

Corning began making radio strain insulators in the mid-1920's. On this basis, I've always assumed that the round-ended strains without patent notices were from the pre-1929 days. The orange box that I found would tend to support this theory. The insulator that it contained was a round-ended 3-1/2" broadcast reception insulator that was only marked with the PYREX trademark. Most other styles of Pyrex strains are marked "Made in USA" and carry patent # 1,700,066. These are assumed to date from 1929 and later.

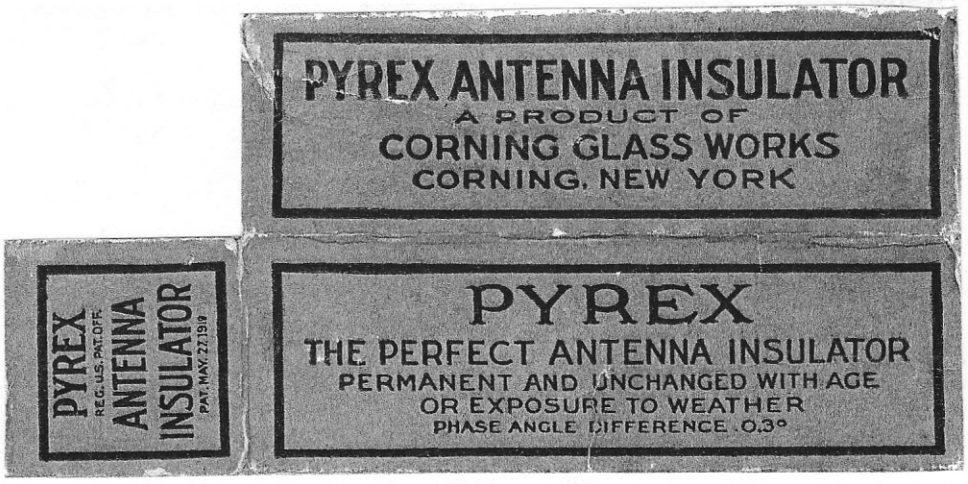
Further supporting the theory, the end flap of the orange box is marked with the 1919 patent date. One would have to assume that if it were made in 1929 or later, it would have carried the later patent date (or possibly both).

(continued on page 6)

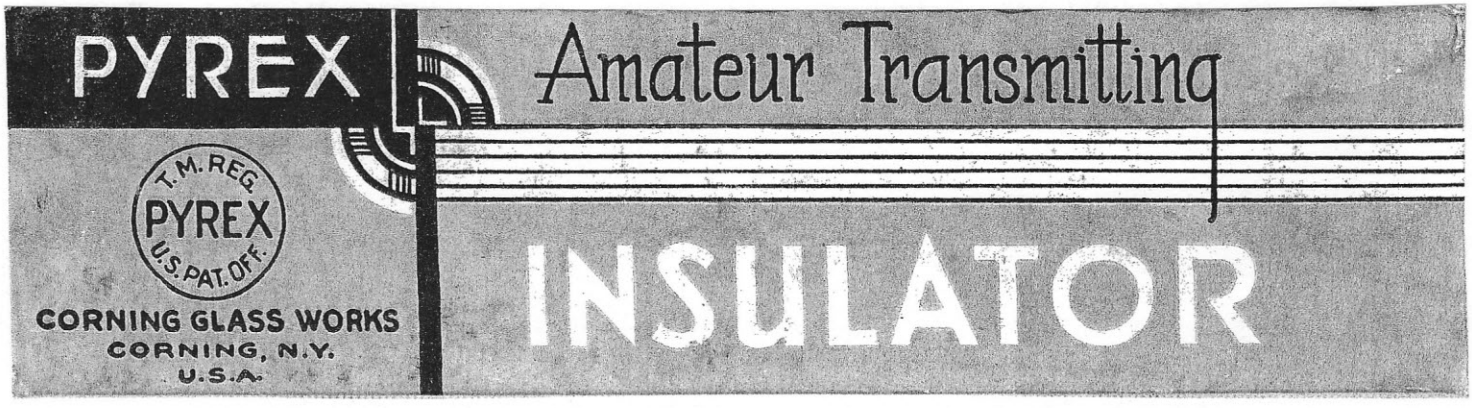
[1] The orange box was shown in color in the April 1999 issue. The red box was shown in color in the April 1998 issue.

[2] **Elton Gish** recently shared a copy of this patent with me. The preamble is especially interesting and illuminating. An earlier (design?) patent, #36,196 filed in 1915, was apparently too broad because it dealt not only with use of Pyrex glass in baking dishes, but also with the composition of the glass. The Patent Office required the inventors to refile in 1919. Two new letters patents were issued. Patent #1,304,622 covered the baking dish. Patent #1,304,623 covered only the composition of the glass.

Patent 1,700,066 was another "application-of-the-glass patent." If I'm reading it correctly, it took the glass recipe patented in #1,304,623 and covered its use in high frequency radio insulators.



Orange Box



Gray Box

Red Box

(continued from page 5)

Before we go on, I have an interesting patent "transition" piece that I would like to tell you about. A couple of years ago, I found a pair of #67019 7" Pyrex standoff insulators. The glass on one insulator is embossed with the word "PYREX" and the patent # 1,700,066. The other is embossed only with the word "PYREX."

However, someone has crudely hand stamped the brass top cap of the second insulator "P A T 1700066." Although the marking is completely legible, the letters do not line up well and several of them have been struck more than once.

I would speculate that the item was made around the time that the 1929 patent was granted. After the decision was made to mark the insulators, but before they had time to retool the glass mold, apparently some worker sat and marked each insulator letter-by-letter. Because of the incredible labor involved here, I suspect that the mold was engraved shortly after.

2. Second – The Gray Box

It is hard to say whether the gray or the red box came next.

Both my gray and red boxes are for the amateur transmitting (7-1/2") insulators. And both boxes carried the exact same part number.

The picture shows that, of the two, the gray box has fewer "brand" "Trademark Reg." notices on it. This leads me to believe that it may be a little earlier.

3. Third – The Red Box

As discussed above, I believe that the red box was later than the gray box. Worthy of note, my gray box came packed with a Style 2 "skinny" 7-1/2" insulator and the red box, with a Style 3 "thick" style. Of course, people can swap insulators between boxes. Perhaps, with more research and more specimens to examine, we can learn more about these differences as well.

I am sure that there are more styles of Corning strain boxes to find. We know for a fact that Corning made strains for the military and they probably would have had special mil-spec boxes for these. Please share news of other boxes that you may have in your collection.

Part II – Another Neat Strain

When we published the picture of Rick Soller's "Style 5" 7-1/2" strain in the April 1998 issue (page 5, figure 4, letter a), it was the only example known to me.

Well…it's no longer alone.

Now that I've had a chance to examine one of these, I'd like to pass along a few observations.

To me, it looks like a transition piece between the Style 2/3 insulators with the saddleways (figure 4, letter e&f) and the Style 4 insulator with the reinforced ends (figure 4, letter b). The insulator with the reinforced ends has been assumed to date from after World War II and is believed to have been the last style made.

The glass pouring pottles on Style 5 are unusual and warrant some discussion. On Styles 1 – 3, Corning used end pottles which are generally ground flush. Style 4 insulators used side pottles on the glass flukes. Style 5 insulators have the pottles on the sides of the glass flukes as well. And, as you can see in Rick's picture, the Style 5 insulator has a casting pottle on the left side of the center rib.

On the right side, the glass flukes and the "pottle" on the middle rib were actually carved out in the mold (presumably to make the right side match the left in appearance).

On the left side, it looks like glass could have been poured from both ends and the middle or perhaps, one or more of these was a vent for drawing air from the mold. In the center, the pottle was broken off and only minimally ground. The other pottles have also been ground, possibly by hand, as the edges have been unevenly beveled. This is a significant departure from the finish applied to the other Corning insulators.

I believe that the insulator most likely "fits" between the Style 2/3 and Style 4 insulators. It incorporates the improved saddleway ends like Styles 2 & 3. And the smaller flukes would be a logical intermediate step in strengthening the insulator. My best guess is that Style 5 was a transition between Style 2/3 with the tapered ribs and Style 4 with its large one-size ribs and heavily reinforced ends. Judging from the rarity of Style 5, the company quickly abandoned the design in favor of Style 4.

Now, continuing on with my discussion of patent markings...Corning seemed to mark just about "everything" with its patent #1,700,066. So, I assumed that unmarked pieces must date from before 1929. But how do we explain some of the later styles without patent marks that have been reported by readers?

Patents only last 17 years. Doing the math, patent #1,700,066 probably expired January 22, 1947. Is it possible that some of these late units were unmarked because the patent was no longer in force?

The thing that initially motivated me to consider the issue of the "missing patent date" was that the Style 5 insulator was only marked with the PYREX brand name. Assuming that it would have been marked with a patent date if the patent had been in force, my two choices for dating the insulator were to place it *before* 1929 or *after* 1947.

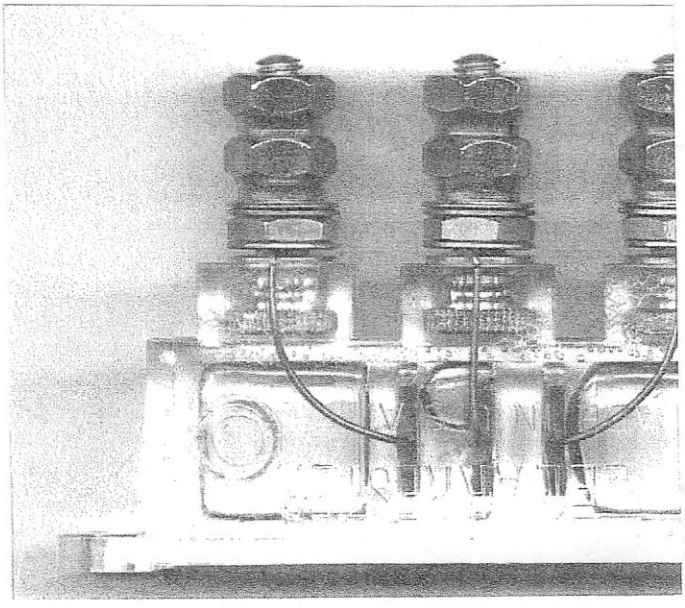
Both the Style 2/3 and Style 4 insulators are usually found with the Pyrex patent number. How could the Style 5 have been made without a patent date and still fall between the Style 2/3 & 4 insulators? At least one late style 12" insulator has been reported without a patent date. So maybe my placement of the insulator does make sense. I just don't know.

Maybe Style 5 is older than it looks or there is some other explanation. What do you think?

Tantalum Lightning Arresters

By Dan Howard

We discussed Tantalum brand lightning arresters just a bit in the article about mythological names in the last issue[1]. At that time, my only source of information for these "mythical" lightning arresters was a note from **Bill Shaw** that he had one.



Bill was kind enough to have me over for a visit during my New York trip. High on my list of things to see was his Tantalum arrester. Besides being see-through, this arrester is the only one that I know of that is liquid-filled! In Bill's close up picture, you can see that the leads from the spark gap to the binding posts run on the *outside* of the casting. Interesting!

Tantalum lightning arresters were made by Fansteel Metalurgical Corporation (No. Chicago, IL) in the 1950's.

Bill e-mailed me the instruction sheet and illustrations which appear below. Oxide type arresters are not new. GE was studying oxide lightning arresters back around the turn of the century. I recall that they were generally referring to a metallic oxide that would provide insulation within a granular arrester.

This is the only example of a liquid filled arrester that I know of. More information on this fascinating item would be appreciated.

[1] See the article "What's in a Name: The Role of Mythology in the Naming of Insulators and Arresters" in the June 1999 *OFS*.

INSTRUCTIONS ID-780

For Types L-4 and L-5

FANSTEEL-BALKITE TANTALUM ARRESTER

For protecting low voltage equipment and circuits. Do not use for any other purpose without consulting factory.

This is an electrolytic arrester which provides a low impedance shunt and ground path for lightning and other high frequency a-c surges common in signal circuits.

The elements are Tantalum, a high capacity film-forming material, which has indefinite life. Electrolyte is a calcium chloride solution. It freezes without damage at extremely low temperatures seldom encountered in signal cases.

Installing Arrester

The arrester is hermetically sealed and is complete with electrolyte. It may be mounted in any position using 1/4" round head screws.

Connecting Arrester

Figures show ground connection for 3-element arrester Type L-5. Ground is omitted in the shunt type arrester Type L-4 with two elements.

This arrester is not polarized, and may be used on d-c or a-c circuits. Normal d-c leakage current is practically zero. On a-c lighting circuits, the arrester takes a negligible charging current of a few milliamperes.

No Testing Required

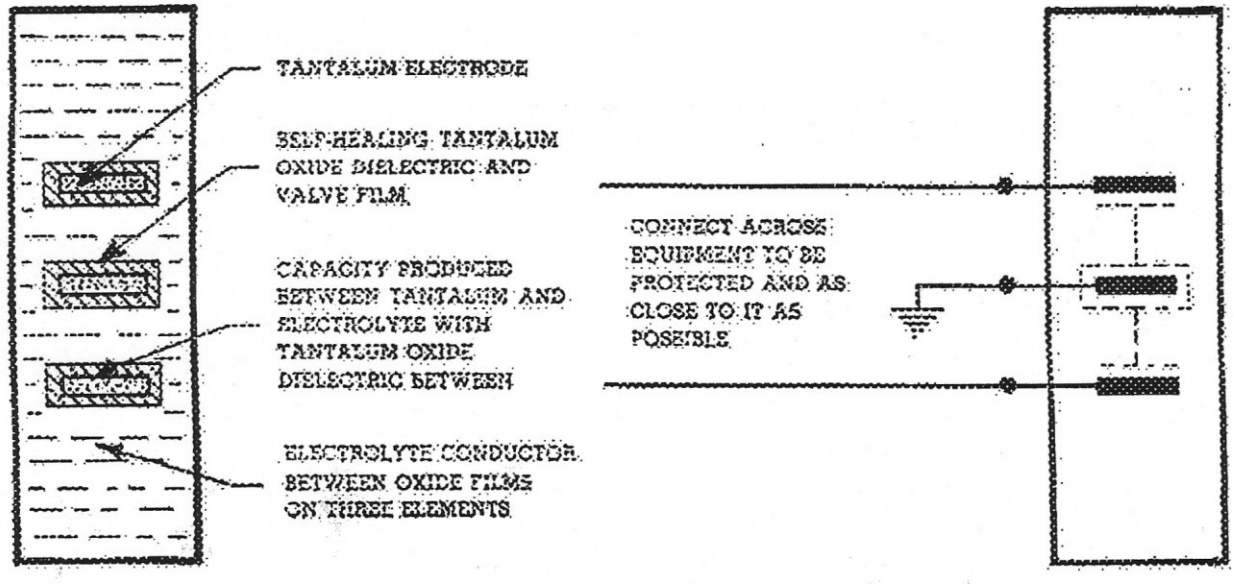
This Tantalum arrester does not lose any of its protecting properties with use or age, so therefore does not require periodic testing. There may, however, be a slight loss of electrolyte with severe use and age.

Electrolyte Renewal

Under normal conditions it should not be necessary to replace electrolyte. As long as the electrolyte level covers two-thirds of the round elements, the arrester will work satisfactorily. If electrolyte level is lower than this, in the position mounted, it should be returned to the factory for refilling.

Any change in color of the elements after the arrester is placed in service is normal action of surge voltages on the tantalum oxide film, which has the peculiarity of changing color when subjected to higher voltages. Discoloration of electrolyte, or sediment deposit in jar indicate that arrester has been operating and are normal actions.

For further information write to the factory.



For maximum effectiveness of arrester, connect both the circuit to be protected and the supply circuit lines direct to arrester terminals and make connecting leads as short as possible.

For Type L-5 arrester, connect one outside terminal to each leg of circuit and the center terminal to ground.

For Type L-4 arrester (shunt type) connect one terminal to each leg of circuit.

Fansteel Arresters can be used in either d-c or a-c signal circuits.

Manufactured in U.S.A. by

FANSTEEL METALLURGICAL CORPORATION

NORTH CHICAGO, ILLINOIS, U.S.A.

Birnbach Update

By Dan Howard

You have already heard my "when it rains it pours" theory of collecting. That is, you will have an insulator on your want list for years, and then suddenly you'll find a box with ten of them.

It happened to me again.

Two weeks ago, my friend Dick brought me a few insulators, including 3 of the Birnbach No. 765 antenna springs, two new in box. All three units use unembossed white spools.

So I *finally* had an antenna spring for my collection. Actually, I had three.

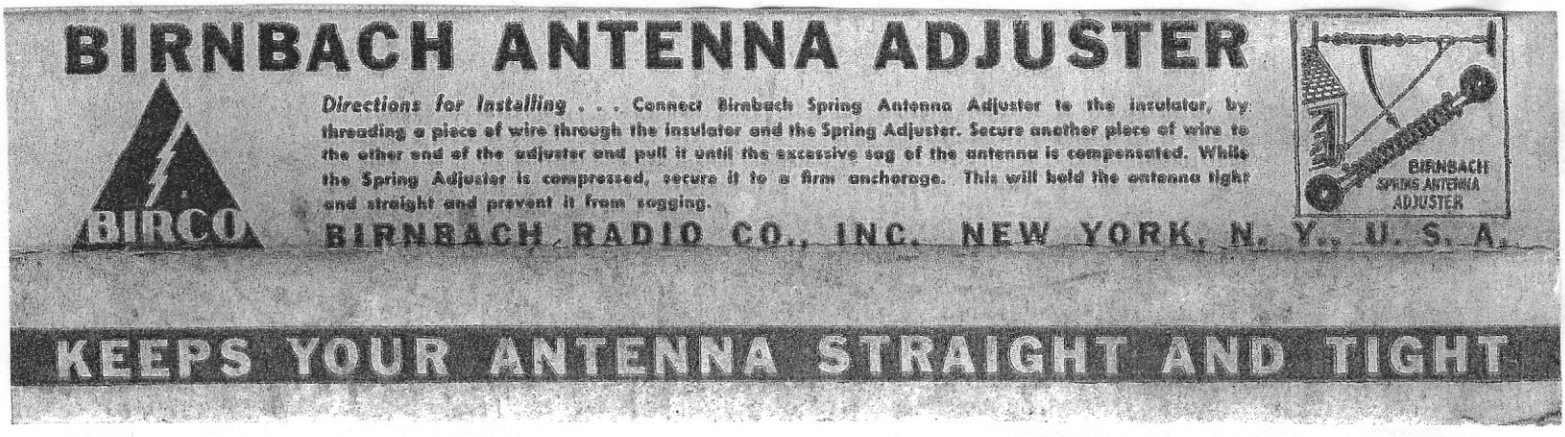
Dad and I went to the local radio club's swap meet today. There, underneath a table were two more of the Birnbach springs, new in box! I couldn't believe it. Now I had 5!

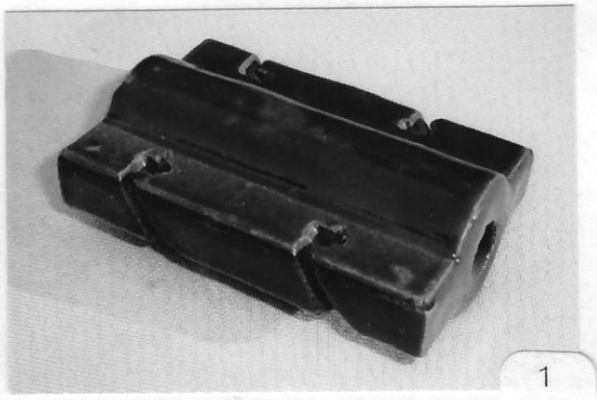
Though the boxes and part numbers were identical to those that Dick gave me, there was one small difference inside. The spools for these springs were glazed in **cobalt blue** and were embossed "Birnbach Radio Co." on the unglazed side.

I've reproduced the side of one of the boxes below so that you can see the text. These antenna springs work by placing a coil spring in compression. The ends are insulated with small (1-1/8") spools. Using an antenna spring in your dipole or other wire antenna keeps it from swinging in the wind.

We showed this item on page 14 of the October 1997 issue. At that time, I was not aware that there were two versions of the 765 spring.

If it happens to have been "raining" Fleron or some other brand of antenna springs out your way, drop me a line and we'll talk about swapping our spares.





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Old Familiar
Strains Magazine

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SPECIAL

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INSULATOR
ROCKY POINT

Photo Credits

Figure 1. Standoff insulator for 200 ohm 4 wire feedline line. See "Thanks for Asking" Photo courtesy of **Elton Gish**.

Figure 2. L.S. Brach and "L.C. Brach" (embossing error) purple insulators. See Rick Soller's letter. Photo courtesy of **Rick Soller**.

Figure 3. Huge strain insulators in the Antique Wireless Association's museum annex building. The tag on the strain in the corner reads "110 pound insulator used at Rocky Point RCA 1920." A large Electrose feedthru is also shown. The AWA museum is outstanding and keeps regular hours. For more information see visit the AWA's internet web site http://www.antiquewireless.org. Also, please refer to the show reports section for information on the 1999 AWA convention.

Figure 4. The Old Familiar Strains table at Ken Willick's tailgater (see show reports). In the background you can see the Air Pocket insulator and its box (see Rocket update). The orange boxes in the right foreground showoff Denise's collection of strains. There are enough blues, purples and greens on the table to make me green (with envy).

Figure 5. What a handsome bunch of gents. The guys were kind enough to take a minute for a mug shot at Ken's tailgater. A total of 5 readers *from 5 different states* were present and frankly that meant a lot to me. I value all of the friendships that have developed through Old Familiar Strains. Thank you everyone. From the left you can see Don Hutchinson (Lowell, MI), your editor (Portland, OR), Don Wrigley (Carbondale, IL), Mike Wildnauer (St. Mary's, PA), Kevin Lawless (Schenectady, NY).

Thanks for Asking!

Elton Gish sent the photo of the brown standoff insulator (figure 1 on the color page).

He writes "Have you ever seen an insulator like in the enclosed photos? Could it have been used for antenna leads? The wire grooves are quite small. I could not find a patent for it in my files. The color is an early looking German chocolate brown."

Ans.

The insulator is a standoff insulator that was used for open wire feedlines. The exact insulator was pictured in a 1953 Air Force manual entitled "No. 52-19 Antenna Systems."

Military and commercial stations used these insulators to keep feedline wires evenly spaced. A large lag screw passes through the body of the insulator and the whole works would be screwed to the side of a building or to a pole.

Similar units were used at Radio Central (Riverhead, NY). The insulators were used on the feedlines for the fishbone antennas. Both the insulators and the fishbone antennas are shown on the cover of the February issue.

The units used at Riverhead had closed holes instead of slots to hold the wires. One is shown below for comparison. I purchased a unit with the closed holes that was used at the Radio Central station from Marshall Etter. (More of these may be available from Mr. Etter – see the classified ads).[1]

The slots in Elton's insulator would facilitate stringing the feedline wires and changing the insulator out, should that be necessary. But what about the unit with the closed eyes? I asked Mr. Etter about these last month at Rochester. Mr. Etter said that at Riverhead they fastened up all of the insulators first. Then they set up a rig with four spools of wire and threaded the feedline wires through unbroken. What a job!

An article in the August 1999 issue of *The Old Timer's Bulletin* describes another station where these insulators were used. In his article "Establishment of the Radio Monitoring Station at Vint Hill Farms," Robert Morris described the building of a World War II listening station in the suburbs of Washington D.C..

Working for the Signal Corps, Mr. Morris visited the Radio Central installation at Riverhead to get ideas for receiving antennas for his station. He and his staff observed the fishbone antenna systems which were alleged to have superior characteristics. However, due the complexity of design, they elected to use 4 fishbone antennas pointed toward Europe and to use a series of rhombic antennas to cover the other points of the compass. Besides the design for the fishbones, another thing that took with them from Riverhead, was the idea of using the 4-wire 200 ohm feedlines.

Mr. Morris writes, "Because of a critical copper shortage, I adopted the four wire, 200 ohm transmission line developed and used by RCA at Riverhead to get signals back from the antennas to the operations center. The line was extremely efficient and free of noise and required four copper-clad steel number 14 wires support by special insulators of which Riverhead had a

[1] The unit and its specifications are also shown on page 9 of the February issue.

goodly stock that would be available to us until we could have more manufactured.[2]"

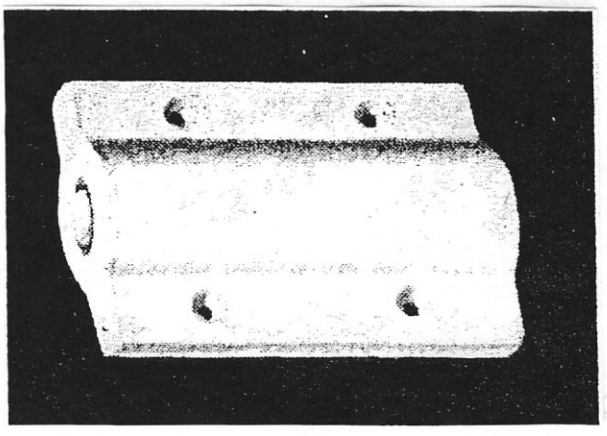
After the War, the military apparently continued to use the open wire transmission lines as evidenced by the illustrations from the Air Force manual.

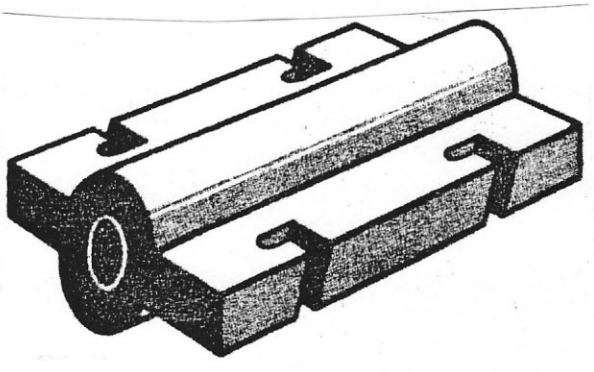
I would call the slotted design of Elton's insulator a decided improvement over the closed eye design. So, it is possibly later. The hole spacing is identical however, so the insulators are theoretically interchangeable.

Again, Thanks for Asking!

Photo Credits:

1. Isolontite 1931 Catalog, pg. 9 (courtesy of **Elton Gish).**
2. Air Force Manual 52-19 "Antenna Systems" June, 1953 pg. 217.





[2] Morris, Robert M. "Establishment of the Radio Monitoring Stations at Vint Hill Farms" *The Old Timer's Bulletin* 8/99, pg. 46.

Letter:

Rick Soller writes:

At a recent bottle show in Gurnee, IL, I bought one of the few insulators at the show – a purple Brach with two large rings on the end and three narrow ones in the middle.

When I got it home and was studying it, I noticed that it read "L.C. Brach" rather than "L.S. Brach." I thought that the second version of the name was correct but I had to check my other strains to be sure. When I did, I discovered two things. First, I learned that I had my first embossing error in a radio strain. Second, I recognized that the mold that made my "L.S." strain had actually been reworked to create an "S" out of a mistaken "C".

I'm sure that if others check their examples of this insulator they will find the same. I hope that you can see the embossings clearly enough in the pictures to see for yourself. (Rick's pictures appear on the color page).

Rick Soller

What a wonderful find, Rick. It's the first embossing error that I'm aware of myself.

I don't have the Brach in purple. But I've examined several clear glass versions of the same insulator. They are actually quite different from the purple version. The large ribs on the clear insulators are sharper on the edges. And the embossing is made in a type face that is completely different from the purple versions in your picture.

I look forward to hearing from other readers on this interesting item.

Thank you so much for sharing your find with us. And congratulations are your appointment to position of NIA historian! We appreciate your willingness to serve in this way.

Show Reports

May 14th, 1999, St. Paul, MN, NARC swap meet (reported by Phillip Drexler)

I am still in the middle of moving but I did go to our local radio meet (NARC) on May 14th and May 15th. I found a Corwico 825, Sensory 3107 and a Cook R-73 protector **which was in the original box.** For strains, I picked up two Pyrex 67017's (7-1/2" Amateur Transmitting insulators) brand new in original boxes.

[This ad for Phillip's Cook R-73 protector came from the Dec. 1923 issue of Radio News. What an outstanding item. Not only does it have a visible gap, but it incorporates a fuse and an antenna grounding switch. Find one for me! Ed.]

August 5, 1999, Elgin, IL, Radiofest 1999 (reported by Dan Howard)

Again this year, my father's trip to Radiofest in Elgin, IL paid off for me. Though he managed to bring back a dozen or so insulators, Dad said that the dealers are becoming less interested in selling by the box full and more inclined to sell by the piece. Sometimes that's ok (especially when we have to watch out for luggage weight restrictions on the airplane).

Don Wrigley also reported finding insulators at Elgin. Both he and my dad got some interesting brown porcelain strains with an embossed "Germany" mark. These are the same as some unembossed (probably US) strains except for a difference in the shade of the glaze.

August 14, 1999, Portland, OR, 3rd Annual Filling the Void show and sale (reported by Dan Howard)

The third annual Filling the Void show was very enjoyable, though several regulars were missed. As would be expected, summertime plans created conflicts for some. We met several new collectors who found us through the web or who followed the signs in.

The long distance collector was Clair Cunningham who visited us while on vacation from southern California. This year we opened up my parent's two-car garage and set up tables in the garage and up the driveway.

Though we ended up with a sunny and mild day, the threat of rain had us watching the skies. The rain finally came as the last guest were saying their good-byes. Though there was not much action on antenna insulators, lots of small

porcelain pin insulators changed hands during the show.

August 15, 1999, Seattle, WA, PSARA annual radio swap (reported by Dan Howard)

Back-to-back shows for me again this year with PSARA following immediately on the heels of the Filling the Void show. Unfortunately the rain followed us up I-5 Saturday night and we had a pretty soggy show on Sunday.

Last year it was Spokane and Seattle. This year, after we cleaned up from my show, we made three-hour drive to Seattle, arriving at 11:00 p.m.. Up again at 5 a.m.. The hotel should give a discount – we hardly had a chance to use the linens. We arrived at the show at 6:00 a.m. to an already bustling parking lot full of buyers and sellers.

My first stop was a mixed bag of insulators with a very nice Keystone brand lightning arrester. A little later, I wandered across the aisle to inspect a garbage can full of strains (yes, another garbage can like the sale I reported on in the December issue – strains really deserve better than this). So, swallowing my pride, the garbage pail came home with me.

My father's sharp eyes added a 3-pound coffee can full a few minutes later. These were followed by a pair of a new style of Pyrex standoff insulators. It was a good thing that I was able to dispose about 50 pounds of radios and tubes because we easily added at least that much more in strains to bring home.

The best pieces – well it was certainly nice to find that porcelain Keystone arrester with the original mounting bracket. Several new styles of bar insualtors and a pair of green porcelain strains came home with me.

Size-wise the winner was 15" x 1-1/2" brown rod with an Illinois ink marking. It bears a Tod's style 9 underglaze marking with a 1943 date. Though it was likely a military production item, it doesn't seem to fit with the military specifications that I have seen and it bears no military markings.

September 2, 1999, Rochester, NY, AWA annual convention (reported by Dan Howard)

How wonderful to meet several *OFS* readers at the annual Antique Wireless Association convention.

We made a new vinyl banner for *OFS* prior to leaving for New York and had it displayed prominently in hopes of meeting some of the readers amongst the approximately 200 outdoor vending spots. (You can see this "masterpiece" in one of the show pictures on the color page).

Bill Shaw came by the show on Wednesday, but couldn't find my table (shows how well the banner worked)(he did find us on Thursday).

Don Wrigley and I ran into each other and we had several nice chats. Don was set up with a space of his own and some strains available. He and I swapped a few during the course of the two-day show.

George Freeman came by several times. Now that he's retired, he has a little more time for his hobbies and has resubscribed to *OFS*.

Marshall Etter was there from Long Island, NY, and brought more of the insulators from Radio Central. There are still plenty left. I've rerun his ad in this issue. You should really send for his for sale list. He has several interesting porcelain styles for sale at reasonable prices.

By Thursday, everyone seemed to have found plenty of new ones and plenty of sun. (With my sunburn, I looked more like I had been in Hawaii than in New York). Don and Bill both had pretty good piles of goodies to brag about. I was able to add half-a-dozen new strains and as many new lightning arresters.

I make no secret about my lack of knowledge about pin insulators. Well, I still couldn't resist going through a milk crate full of blue and clear ones. At least I figured that there might be something that another collector could use. Amongst the obviously common "junk" was a Hemingray No. 9 insulator that was full of milky swirls.

I've heard that unusual colors are sometimes in demand so I figured that I'd ask the prices. The dealer's only response was "well...I don't know." And I can honestly say that I had no clue either. I just figured that I didn't want to risk more than about 25 or 50 cents on this item. I never could get a straight answer from the dealer.

Well, it was early on Thursday, and it looked like it could be a mighty warm day (Wednesday had been a late-summer cooker). I went back once or twice as time went on. I expected that he might start to get more cooperative as some of his neighbors started to pack their cars. Finally, as temperatures were well into the 80's I went back for "one last look."

At first I couldn't find the insulator. And then there it was. I swallowed as I prepared to try my luck one more time. Then I noticed that sometime during the day, someone else had apparently dropped the little insulator and had managed to break a chunk out of it. Now, I knew for sure what the No. 9 was worth. Not a darn thing.

September 4, 1999, Lima, NY, CDIC Tailgater (reported by Dan Howard)

Ken Willick, **Kevin Lawless**, and other western New York area collectors were kind enough to promote a tailgate insulator swap in conjunction with my visit to Rochester. NIA Eastern Region Vice President Ken and his wife Denise hosted the show at their home in Lima, NY.

Don Wrigley came over for the AWA show and was able to stay over for the tailgater.

And **Don Hutchinson** drove over from Lowell, MI, for the show (and the lighthouses). Don kindly brought along his strain collection in the back of his truck and we had fun going through it together.

Mike Wildnauer came by and introduced himself. By the way, those are Mike's Knox insulators on page 22 this month.

NIA president, and *OFS* reader, **Kevin Lawless** was there with a table full of pin insulators.

In the shade of our host's driveway and backyard, I enjoyed a relaxing day of talking and swapping insulators. As you can see on the color page, Ken and Denise have a nice collection of radio strains of their own. The collection includes a good assortment of colored glass as well as one of the "rocket" insulators in a complete box (see article on the follow page).

Photos of the crew and of Denise's insulators appear on the color page.

Rocket Insulators

By Dan Howard

I suppose that it's the "little mysteries" in the hobby that keep many collectors interested. And recently I sure get a kick out "breaking through" on some of the unanswered questions.

On page 12 of the June 1996 issue, we showed a sketch of **Shirley Patocka's** "Rocket" insulator box. The cobalt blue rocket-shaped insulators are certainly one of the more interesting looking strains. The unembossed units have never been attributed to a particular company, however. And the fact that half of the end panel on Shirley's box had been torn off, just caused more questions. Was "ocket" the remains of the word rocket? The insulator certainly looked like a rocket or missile. Of course it also looks like a Christmas tree.

When Ken Willick brought out his collection, I was stunned to see that he had one of the rocket insulators new in the box. We carefully turned the box around. I held my breath to see what (if anything) was left of his label. Would we finally have a chance to examine an intact example. Yes!

And there it was:

Air Pocket
Radio Insulator
A Power-Dyne Product
Manufactured by
W.B. Mfg. Co.
New York, U.S.A.

Well, in addition to resembling a rocket and a Christmas tree, the insulator does have a prominent "air pocket" (if you want to call it that) underneath the petticoat. If you followed the leakage path from the small end, surface current would have to travel to the edge of the petticoat and back under the petticoat to the point where the "trunk of the tree" picks up and then out to the far end. Also taking into consideration the corrugated surface of the petticoat, for its size this insulator does have quite a long leakage path.

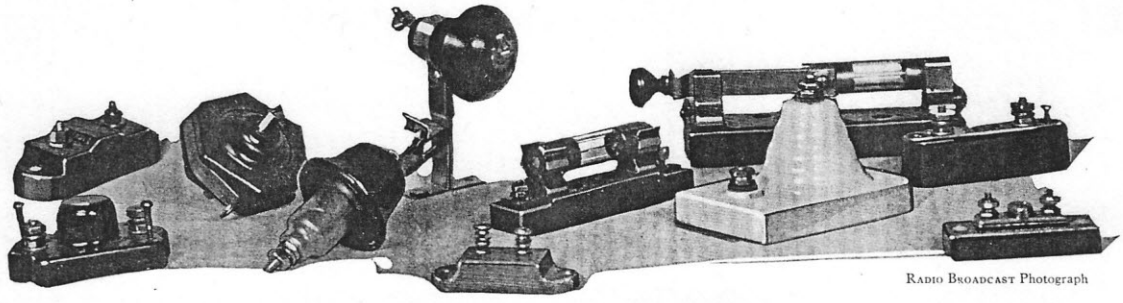
The petticoat serves another purpose, that of a rain shield. As seen on some of the large commercial strains, rain shields were commonly employed to prevent surface conduction due to surface wetting.

Well, I should probably correct myself. Even without little mysteries in the hobby, outstanding insulators like the cobalt air pocket strain should be enough to keep most collectors interested for a long time to come.

[This little article appeared in the July, 1926, issue of Radio Broadcast. It presents a bunch of interesting information on how lightning arresters work. I've reproduced it here intact. Ed.]

The Lightning Arrester

The Different Types Available—How the Arrester Works, Its Care, and Installation —The Best Ground to Use—The Rules of the National Board of Fire Underwriters



Radio Broadcast Photograph

By H. MELCHIOR BISHOP

PARAPHRASING that famous writer who began his discourse on "Snakes in Ireland" with the flat statement that there are no snakes in Ireland, the author will begin his discussion of "Lightning Arresters" with the declaration that there is no such thing as a lightning arrester. So far, nothing has ever been found which could "arrest" lightning, or even slow it up, because once started, it has that pronounced "go-getter" quality which always succeeds. In the case of lightning, the success is often disastrous to the *n*th degree.

So the term "lightning arrester" is a misnomer. Yet the device called by that name has a very distinct utility in protecting the radio set from injury by lightning. In fact, it protects the entire building, for there is no better lightning rod installation than a properly erected antenna, grounded through a suitable "lightning arrester."

The word "grounded" in the previous sentence, gives us our first real key to the actual action of the lightning arrester. The device is really a condenser of very low capacity which is connected in some suitable manner across the antenna and ground posts of the set and which could be more accurately termed a "protective condenser." It is not, of course, located on the set, but is usually placed at the point where the lead-in enters the building, and preferably on the outside of the building.

Due to the extremely low capacity of the arrester, its tendency to by-pass radio frequency currents is so small as to be negligible, and due to the infinitesimally low voltage of these currents, they cannot possibly jump the air gap. A high voltage, high amperage charge, however, which would be capable of injuring the set, tends to jump the air gap between the terminals of the arrester (this gap is usually about 0.005-inch), and ground itself. Let us see why this is so, and how this operation protects the set and operator from injury by lightning.

To do this, let us first refer to Figs. 1 and 2, which show the principles of construction of the two types of arrester in common use. Fig. 1 shows the air gap type, while Fig. 2 shows the vacuum gap, or vacuum type, as it is often simply called. There are other types of lightning arresters in use, such as the horn gap and saw tooth type, but due to their bulkiness, and to the fact that no circuits of great current-carrying capacity are to be protected, they are rarely used in radio receiving work. Of the two types in general use, there are many variations, and practically all of these are good if properly constructed.

HOW THE ARRESTER WORKS

WE NOW turn to Fig. 3, which shows an air gap type of lightning arrester connected to the radio-frequency input end of a receiver. Suppose a signal to be

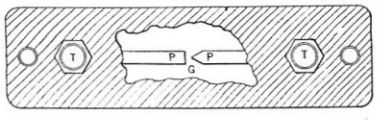


FIG. 1

The air gap arrester. The air gap, G, is about 0.005 inches wide

impressed upon the antenna; the radio-frequency current is too weak and low in voltage to jump across the points which form the gap in the lightning arrester, although these points, as stated above, are usually only about five thousandths (0.005) of an inch apart. The area of these points is so small that their condenser or capacity effect is practically nil, hence there is no path for the signal except that through the antenna coupling coil and thence to ground. The set is therefore actuated by this radio frequency current, and a signal is produced in the telephones or loud speaker, as the case may be. Suppose now that a high potential atmospheric electrical discharge takes place, and is picked up by the antenna. Such discharges are almost always erratic and fluctuating in character, therefore the antenna coil of the set exerts a powerful choking action upon them, even though the inductance of this coil is comparatively very low in value. For this reason, and due also to the high voltage nature of the discharge, the major portion of it tends to jump the short gap in the arrester and ground itself, without causing any more effect on the set than a loud static crash which will possibly drown out the signal for a moment. Though the length of the gap in the vacuum type of lightning arrester is greater, its action is identical due to the fact that the partial vacuum which is maintained in this type reduces the discharge resistance between the points.

"It is all very well," you say, "to drain off ordinary high potential atmospheric electricity in this manner, but what has all this to do with actual lightning protection?" To answer this question, it is necessary to ascertain what lightning is, and what causes it.

Lightning is a discharge of extremely high potential atmospheric electricity, and is really the breaking down of the dielectric of a huge condenser, in which the storm cloud is one plate, the earth the other, and the intervening atmosphere is the dielectric. During, and just before a storm, this charge gradually builds up, never attaining its full potential suddenly. If, then, a grounded conductor projects into the storm cloud, or even, as is the case with most antennas, comes close to it, the effect is to prevent the building up of this charge to the tension necessary to cause a breakdown of the intervening air strata, and hence, that particular spot is rarely, if ever, visited by lightning. The effect, then, of a properly grounded antenna, is that of a lightning rod, but, due to its greater collecting surface, the result obtained is more completely efficient, offering unequalled protection from lightning.

CARE AND INSTALLATION

WHILE the lightning arrester is a very necessary and useful piece of equipment, it may in rare cases be the cause of poor reception, or even actual failure to receive any signals. The fact that a lightning arrester, after months or even years of use, is finally the cause of this type of trouble, does not necessarily prove that the device was faulty, for the following reasons.

In the first place, and especially in the case of the air gap type, repeated discharges across the gap to ground may gradually burn the surface of the points, causing a powder of metallic oxides to form on the burned surfaces. This oxide tends to fall off, and gradually fill the gap, causing a partial or complete short-circuit of the arrester, which in turn causes the radio frequency currents to be erratically bypassed to ground before they reach the set.

In the case of the vacuum gap type, if the vacuum is destroyed by any accident to the arrester, such as the breaking of the cement which seals the gap points into the glass or bakelite tube, the operating resistance of the arrester becomes higher, and the degree of protection is consequently reduced. This defect, however, can fortunately be detected in the average case due to the fact that the terminals will be loose, or the casing cracked.

When installing the lightning arrester, locate it preferably on the outside of the building and near to the window where the lead-in is to be brought in. Then run the lead-in directly down to the arrester in as short and straight a line as is consistant with good appearance, directly to the set. Do not cut the lead-in at the arrester, but wrap it around the terminal of the arrester and bring it in without breaks or joints. This is recognized by radio engineers as the very best practice.

The best type of lightning ground is an iron rod or pipe from four to six feet in length driven into the ground as far as possible, directly below the ground terminal of the lightning arrester. From this terminal, a wire, bare or insulated, but preferably the latter, and at least as heavy as the lead-in wire, is run in a direct line to the ground pipe and fastened securely to it by means of a stoutly constructed ground clamp. The clamp is exposed to the weather and a flimsy one will soon corrode and make poor contact.

If impossible to obtain this type of ground, the next best one is a cold water pipe, located as near as possible to the set and lead-in. A hot water pipe or radiator connection can also be used with very good results, but don't use a gas pipe.

Where it is more convenient to use an inside ground connection, it is necessary for high receiving efficiency to keep the ground lead-in well separated from the antenna lead-in, or to mount the lightning arrester on the interior of the building.

FIRE UNDERWRITERS' RULES

IN THE 1925 issue of the code book of the National Board of Fire Underwriters, some rules are given with regard to the installation of lightning arresters. These regulations are given below, for the aid of the reader, and have been taken from pages 144 and 145 of the code book.

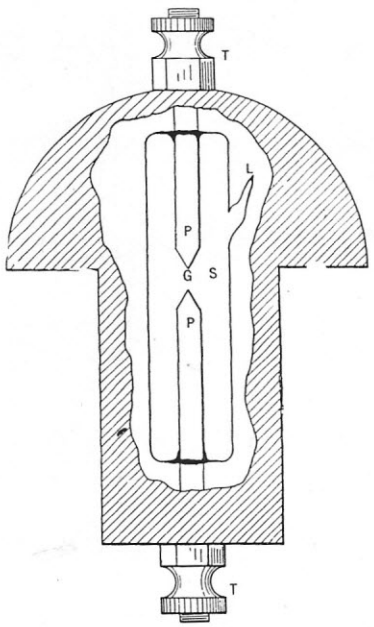


FIG. 2

The vacuum type of arrester. The width of the gap depends upon the degree of vacuum. The inner glass vacuum tube is indicated as S. L is the seal off

1. Each lead-in conductor shall enter the building through a non-combustible, non-absorptive, insulating bushing, slanting upward toward the inside, or by means of an approved device designed to give equivalent protection.
2. Each lead-in conductor shall be provided with an approved protective device (lightning arrester) which will operate at a voltage of 500 volts or less, properly connected and located either inside the building at some point between the entrance and the set which is convenient to a ground, or outside the building as near as practicable to the point of entrance. The protector shall not be placed in the immediate vicinity of easily ignitable stuff, or where exposed to inflammable gases or dust or flyings of combustible materials.
3. If an antenna grounding switch is employed, it shall, in its closed position, form a shunt around the protective device. Such a switch shall not be used as a substitute for the protective device. (Note "S," Fig. 3).

   It is recommended that the antenna grounding switch be employed, and that in addition a switch rated at not less than 30 amperes, 250 volts, be located between the lead-in conductor and the receiving set.
4. The protective grounding conductor may be bare and shall be of copper, bronze, or approved copper-clad steel. The protective grounding conductor shall be not smaller nor have less conductance per unit of length, than the lead-in conductor, and in no case shall be smaller than No. 14 if copper nor smaller than No. 17 if of bronze or copper-clad steel. The protective grounding conductor shall be run in as straight a line as possible from the protective device to a good permanent ground. Preference shall be given to water piping. Other permissible grounds are grounded steel frames of buildings or other grounded metal work in the building, and artificial grounds such as driven pipes, rods, plates, cones, etc. Gas piping shall not be used for the ground.
5. The protective grounding conductor shall be guarded where exposed to mechanical injury. An approved ground clamp shall be used where the protective grounding conductor is connected to pipes or piping.
6. The protective grounding conductor may be run either inside or outside the building. The protective grounding conductor and ground, installed as prescribed in the preceding paragraphs, 4 and 5, may be used as the operating ground.

   It is recommended that in this case, the operating grounding conductor be connected to the ground terminal of the protective device.

   If desired, a separate operating grounding connection and ground may be used, this operating grounding conductor being either bare or provided with an insulated covering.

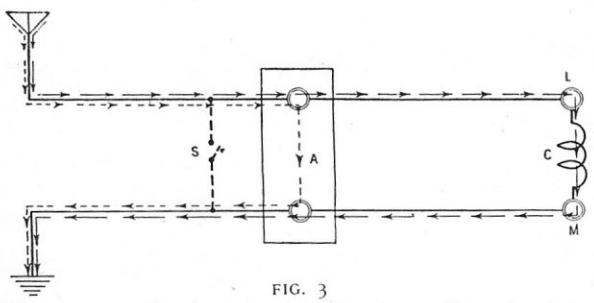


FIG. 3

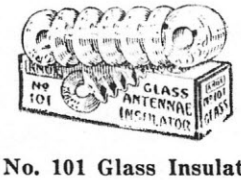
The correct connections for an arrester. The antenna and ground posts are shown as L and M., while C represents the antenna coil of set. The dotted arrows show the path followed by high potential atmospherics, while the other arrows indicate the course of the incoming signals

Mike Wildnauer's Knox Boxes

The printed design on these Knox insulator boxes wraps over the side in such a way that it takes a pair of boxes to see the whole picture.

In the picture below, **Mike Wildnauer** shows us nearly *75* pairs of boxes in a massive display. I guess that he wanted to be sure that we all "got the picture." [I also tucked in some Knox ads from 1930 that came my way recently. Ed.]

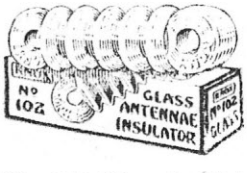
Nearly identical boxes are found with the Cornish Wire "Corwico" brand name. Most likely, Knox made the Corwico insulators. Or perhaps both company's insulators were made by the same third party. We'll cover the Knox story more thoroughly in a future issue.



No. 101 Glass Insulator
Individual Cartons
Lgth. 3"—Dia. 1⅛"

Price per 100

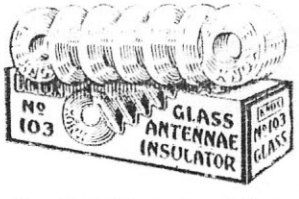
Pkgs. 5000	$5.00
Pkgs. 1000	5.56
Pkgs. 500	6.11
Pkgs. 100	6.67



No. 102 Glass Insulator
Individual Cartons
Lgth. 4"—Dia. 1⅜"

Price per 100

Pkgs. 5000	$5.89
Pkgs. 1000	6.44
Pkgs. 500	7.00
Pkgs. 100	7.56



No. 103 Glass Insulator
Individual Cartons
Lgth. 5"—Dia. 1½"

Price per 100

Pkgs. 5000	$7.78
Pkgs. 1000	8.33
Pkgs. 500	8.89
Pkgs. 100	9.44

Classifieds

For Sale: Rare Pair – airplane antenna insulator MX-273/AR (Dayton Aircraft products) and matching antenna spring. Both appear unused. $15.00 for the pair, postpaid. Dan Howard, 2940 SE 118th Ave., Portland OR 97266-1602.

For Sale: Radio Strains from Radio Central. Many styles are available. New sales list with over 30 types listed. Send SASE to Marshall Etter W2ER, 16 Fairline Dr., East Quogue, NY 11942

For Trade: Lightning Arresters

- Black porcelain "Fleron" titled "Sentinel", unusual shape, excellent condition, approx. 3" x 2"
- Imperial brown "Eagle" block type, couple of flakes on top, approx. 3" x 1"
- Brown L.S. Brach, titled "Storm King", block type with rounded ends, excellent condition, approx. 4" x 1-1/4"
- Cobalt "Fleron" titled "Home Guard" block type with rounded ends, one small ping on base, approx. 3" x 1"
- Brown composition "Belden" 2-3/4" x ¾"

Will trade for radio strains or other lightning arresters I do not have. Contact **Jeff Hogan**, 67 Winthrop Ave., Umatilla, FL 32784

New Readers

George Freeman 102 E. Main St., Madison, IN 47250-3411

Skip Henderson P O Box 2453, Chapel Hill, NC 27515-2453

Amy Hughes 3153 Forest Breeze Way, Saint Cloud, FL 34771

Wanted: Large porcelain radio strains. Also brown porcelain rectangular insulators especially sizes over 6". Also seeking Hemingray green 4"-5" radio strain marked "H.G. Co." Alan Hohnhorst, 289 Compton Rd., Wyoming, OH 45215.

Wanted: Information on the E.F. Johnson company and its insulator products. Please call or write ASAP. Dan Howard (503) 761-7799.

Wanted: 12" Pyrex radio strain with Navy "SE" markings. Will trade Pyrex strains or standoffs. Dan Howard, 2940 SE 118th Ave., Portland OR 97266-1602.

New Addresses

Old Familiar Strains – strains@insulators.com

Gene Condon 1916 Sam Rittenbaerg Blvd., Apt 1209, Charleston, NC 29407-4880

Alan Stastny P O Box 23, Arcanum, OH 45304-0023

German Insulator Update

By Dan Howard

On page 14, of the February 1998 issue, we looked at a 4-7/8" German porcelain insulator. These have been reported in both brown and a coppery carnival-type finish.

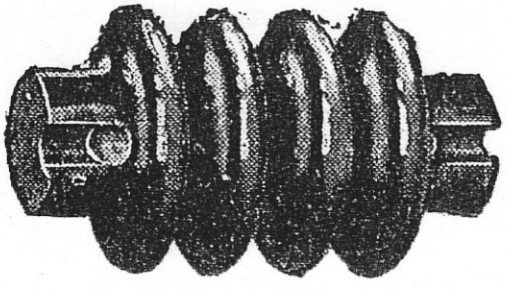
Add a new variant to the list. A friend just found one of the coppery finish insulators with 3 embossings! The word Germany appears in the normal place on the edge of a rib. And then it appears on the edge of a rib on the back of the insulator. And then again in the valley between to ribs on the back.

Note, these are embossed markings. That means that someone didn't just strike the insulator with a marking tool a couple extra times. They would have had to engrave the mold at some point to add these extra marks. Very interesting.

Please look your insulators over and let me know about other embossing anomalies.

No. 30060 Trumbull Radio Insulators

Schedule B



Made of the best grade porcelain, brown glazed.

Tensile strength is far in excess of any ordinary requirement.

Cat. No.	Length Inches	Price per 100	Price per 1000
30060	2¾	**$7.00**	**$58.00**