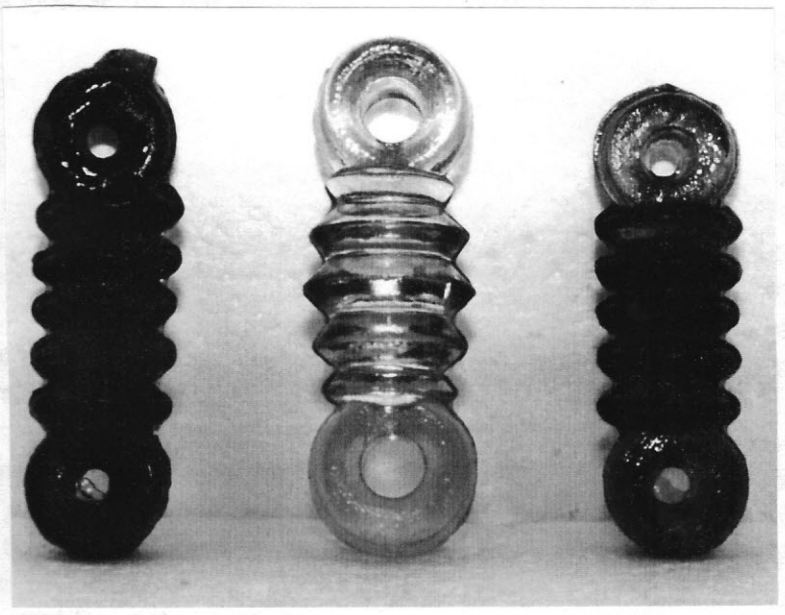
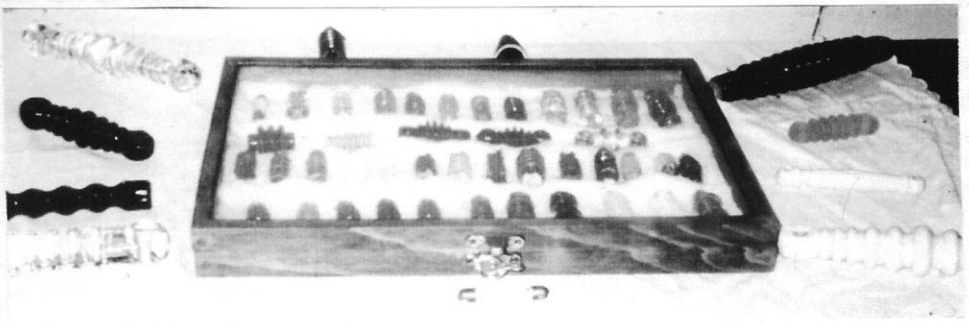
Old Familiar Strains

a newsletter for collectors of radio strain insulators and related items
Volume 4 No. 3 June 1997

It's showtime!!





2016 PDF edition

Editorial

I don't know if it was disappointment over not getting to go to nationals this year, or despair over the fact that the Oregon collector's have no show to call their own, but I decided to do something about it. On August 9, I will be hosting an informal insulator show-sale-swap-picnic event. This free backyard event is open to all. Bring stuff to trade or sell. Help me go through the boxes of traders from my attic. Whatever, just come if you can. The event will be publicized throughout Oregon and Washington via direct mail, and I will try to get an ad in Crown Jewels.

And speaking of shows, this month's cover features insulators seen at shows last year. The Blairs put on an outstanding display at one of the Midwest shows (photo courtesy of Bob Stahr). John McDougald photographed some of my finds at the Long Beach show. If you can send along photos or stories from shows you attend this year, I would be much obliged.

No bids were received for the Radio Central insulators. I will have them available at the August 9 show.

Shortly after the April issue went to press, Steve Coffman wrote to let me know that his plans for the new magazines had changed. They are currently on "indefinite hold."

Unless I do a commemorative issue for the August show, the next issue will most likely be a Fall double issue as in years past - sometime between August and October.

Well, that's the news for now, I hope that you enjoy the issue.

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Boxes for Radio Antenna Insulators

by Rick Soller

At the college where I teach, computer labs all over the campus receive boxes ideal for the storage of radio antenna insulators. The boxes are approximately two inches deep, nine inches wide, and fifteen inches long. Many come with foam to protect computer circuit boards. The foam padding and box size are ideal for most radio antenna insulators. The lids are strong enough for stacking and have tabs which allow the boxes to be closed tightly. If foam didn't come with the box you find, you can get some easily enough at a fabric store.

Cataloging Radio Antenna Insulators: Part V

by Dan Howard

Molded Composition Insulators

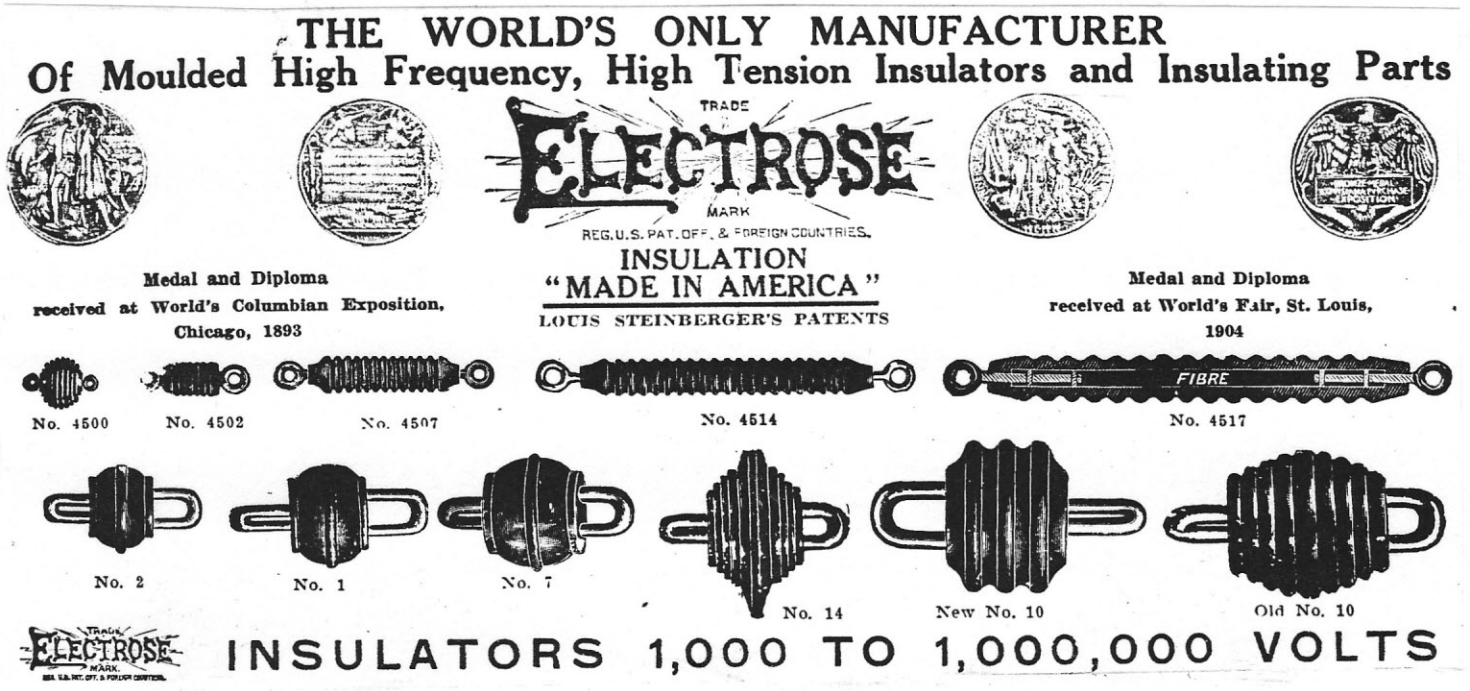


Figure 1

Introduction

As we continue to work on a cataloging system for strain insulators, it seems appropriate to begin the discussion of insulating materials. In addition to the familiar glass and porcelain materials, a number of lesser-known and seldom-seen materials were tried for strains. This month's discussion will focus on molded "composition" insulators and feature those made by Electrose.

Molded Composition Insulators

Although the focus of the article is on the Electrose-type shellac-based molded insulators, the following background information is essential to understanding all types of molded insulators.

[Unless otherwise noted, the information on molding in the following section is from "Molded Insulation" by Lawrence E. Barringer(1)]

Molding Techniques

There are generally two methods of making molded insulation, hot and cold molding.

The first method, **hot molding**, means that the material to be molded is first heated to make it "plastic" then it is compressed in a heated mold. The mold is cooled to cause the material to "set" before it is unmolded. Electrose is hot-molded shellac (2:440).

Some advantages of hot molding include:

a. Accuracy of dimension, the pieces conform precisely to the mold dimension

[note the fine raised lettering detail on many electrose insulators]

b. High mechanical strength [essential for strains]
c. High dielectric strength [also important for strains]
d. Superior finish [good for shedding rain and pollutants]
e. Less abrasive action on molds because of softer fillers [some "hardened steel molds... often produce hundreds of thousands of pieces before wear necessitates their replacement."(1:387)]

[points f-h are from (3:58-59)]

f. Hard and wear resistant
g. Will not break down under normal arcing of electric current
h. Water and oil-resistant

The disadvantages of hot-molded material are:

a. Susceptibility to melting or carbonizing at high temperatures or arcing conditions because of organic binders
b. High cost both of materials and labor of molding. The time required for molding also necessitates greater and more expensive mold equipment for a given output.

Cold-molded insulation is molded at room temperature. The material is rendered pliable by adding water or another solvent to the mix. After removing the casting from the mold, the part is "set" by heating.

The advantages of cold-molded insulation are:

a. Resistance to high temperatures, because of the use of inorganic ingredients.
b. Low costs for both equipment and moldings, because the molds and presses do not require heating and the molded pieces may be removed immediately after formation. Also, fewer molds are required for a given output.

The disadvantages are:

a. Low mechanical strength
b. Low dielectric strength
c. Inferior finish
d. Greater abrasive action on molds.

"Molded materials have only a fraction of the strength of metals when under steadily applied compressive, tensile, or shearing strain" but can perform well if proportioned correctly (1:392) As shown in the cutaway view in Figure 1, Electrose incorporated fiber cores in some of its strain insulators to enhance the tensile strength of the insulators. It appears that the same strain was offered in two versions, one with the fiber core and one without.

Molded insulators can also be brittle when compared with metals. (1:391) However, they possess "a greater degree of toughness than some other groups of insulating materials, notably glass and porcelain."(1:392)

What goes into a molded insulator?

There are two main ingredients in molded insulation, binders and fillers.

Binders are the "glue" that holds the material together. "The mechanical strength, chemical stability, and insulation value of the finished moldings are...largely determined by the nature of the binder used."(1:387) Hot-molded insulators use organic binders; cold-molded insulators-inorganic. Organic binders, such as shellac, the one used in Electrose, or tree resins, are products that are derived from living material.

Fillers are the "inert, finely divided materials used principally to decrease shrinkage (and consequent cracking or variation in dimension), to increase the

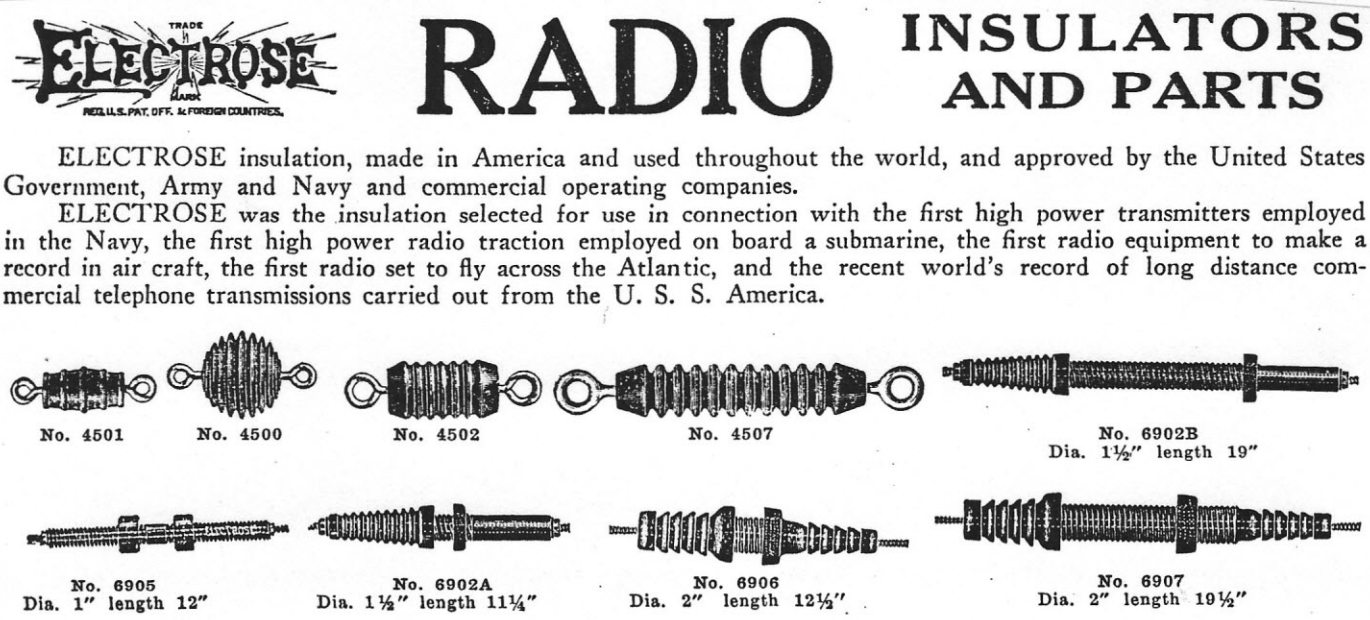


Figure 2

mechanical strength and toughness, and to lower the cost.(1:387)

Both binders and fillers are necessary. "Without fillers, binding materials,...heated to fusion, and then cooled, would undergo shrinkage with resulting cavities, craters, or depressions, and would retain internal strains...and be subject to checking or cracking under mechanical strain." They would also be "excessively expensive." (1:387)

Shellac Binders

As indicated previously, Electrose insulators are hot-molded, and as such use an organic binder, shellac.

Shellac was one of the first plastic materials that humans discovered. Early in history, shellac derivatives were used for glue and other uses.(3:54)

"Lac, the base of shellac, is a secretion exuded by tropical insects and is found in quantity in the India and the Malay States. (3:53) The lac insect, Tachardia Lacca (4:691), sucks tree sap, especially from native fig trees, and secrete shells of digested sap which harden in the air (5:530).

"The word lac is the East Indian term for 'a hundred thousand;' it is without doubt applied to this resin to indicate that such countless numbers of insects are connected with its production" (5:530).

"As first gathered, shellac is called 'stick-lac' and contains twigs, insects, and lac."(2:88) Ground stick lac is melted and the foreign matter and the red coloring "lac dye" is removed leaving pale pellets of lac, called "seed lac." (2:88) The lac remains soluble in alcohol or hot water. (3:54)

In addition to being used in insulators, shellac was used as a binder in abrasive wheels and extensively for making phonograph records. (3:58)

Fillers
Many types of inert materials were used for fillers. Electrose insulators incorporated two fillers, flaked mica and asbestos.

Mica
The word "mica" was derived from the Latin word *micare* (to shine or glitter). (6:403) The glittering, semi-transparent mineral has been used for various purposes since 2000 B.C. In the middle ages, thin sheets of transparent mica were used for windows. (6:403).

Among other places, deposits of commercial-grade mica are found in the United States, Canada, and Mexico. (6:403).

Mica's excellent insulating properties and cleavability, made it a desirable insulator, especially in applications such a capacitors which required multiple layers of thin insulation.

Mica was used as a filler in molded insulators because it possessed the following properties:

- outstanding dielectric and thermal endurance,
- inertness,
- nonflammability, and
- resistance to the harmful effects of corona and radiation (6:407).

For casting purposes, mica must be flaked into very small pieces. Often, trimmings and waste from larger pieces can be saved and utilized.

Naturally-occurring iron, and other contaminates must be removed from the flaked mica to insure the integrity of the insulation. (1:391) In fact, one of the greatest criticisms of molded insulation is the "inconstancy of performance" caused by random impurities in the raw ingredients." (1:393) Flaked mica may be passed over a magnet during manufacture to extract the iron. (1:391).

Asbestos
Yes, it's the "A" word and a word of caution is in order. When inhaled, asbestos has been shown to cause lung disease. In the case of your Electrose insulators, it would be prudent to handle them carefully to prevent chipping or abrading the surface. However, as long as the insulator isn't coming apart, I wouldn't worry about it too much. Remember, it is the small air-born particles that are most harmful.

Asbestos does not naturally possess very high insulating properties (5:611) And it's naturally hygroscopic (it absorbs water)! (5:611) So, why use it as a filler in insulators? Remember, that the binder, shellac, has a low melting point. Asbestos is very heat resistant and is non-combustible (4:611). Using a shellac binder causes heating to always be a significant weakness. However, incorporating asbestos raises the softening point from about 40 °C to 55 °C (1:393).

Like mica, asbestos may have iron in it. After grinding, manufacturers sieved the asbestos to remove the dust and most of the iron, with it. (1:391)

Putting it all together

Mixing
In the mixing phase of manufacturing, the fillers (mica flakes or powder, and or asbestos) [Electrose used both] are added to dry, powdered shellac, without solvents. (2:89-90) Mica is naturally hard and brittle. The shellac binder makes the final casting somewhat flexible and resilient. The percentage of binder (usually between 10%

and 25%) determines the ultimate flexibility of the product. (6:408)

Molding

Shellac begins to soften at about 40 °C. (5:531) After warming, the mixture is placed in a heated hardened-steel mold. Depending upon the filler, molding may take place at temperatures below 100 °C (2:90) However, hot-molded shellac insulators are molded at a temperature of about 250 °F under a pressure of 1000 to 4000 pounds (3:59).

In order to retain their shape, the insulators are cooled in their molds. When they are released they are set and need no further curing.

The final color, a light tan, is, of course, the natural color of the purified shellac.

Thermo-plastic materials undergo a chemical change during the molding process; at the completion of the process, the material is permanently changed. Unlike these materials, the shellac insulators do not change chemically during molding; they remain a simple amalgam of materials and can be reshaped with heat. (Record collectors may be familiar with this phenomenon).

Electrose Manufacturing Co.

The Early Years

Located in Brooklyn, New York, Electrose Manufacturing Company manufactured the insulating compound and the molded composition insulators that bore its name.

Advertisements from the teens and 20's regularly made reference to the company's achievements at the Columbian Exposition which took place in 1893 in Chicago. This would date the origin of the company to no later than the early 1890's.

The company took full advantage of the versatility and excellent insulating properties of its product. Ads picture everything from tiny knobs to large multi-part pin insulators.

Louis Steinberger, was granted and assigned a number of design patents for insulators to Electrose. A member of the Institute of Radio Engineers since 1915, he is listed as the president of Electrose in the IRE's 1929 directory (7:249). In his recent Crown Jewels article, Elton Gish said that "from 1900 to 1929, he (Steinberger) obtained dozens of mostly unimportant patents for various uses of his composition insulators." (8:33)

In 1922, QST magazine commissioned electrical and mechanical tests of strain insulators. They found that genuine Electrose insulators performed very well. They were plenty strong, did not arc-over, and did not absorb water. However, two other types of composition strains from unknown manufacturers exploded or melted during the arcing tests!(9:27)

In the 1920's, the company's products were sold through sales offices and jobbers nationwide. During the same period, home radio hobbyists could purchase four different sizes of Electrose insulators mail-order from the Sears Roebuck catalog.

Making Insulators for the Armed Forces During Two Wars

Electrose was an important supplier of military radio and telegraph insulators. Early on, the U. S. Navy acquired various types of insulators for its ship and land stations. The company's military source code was "CH." (10:70)

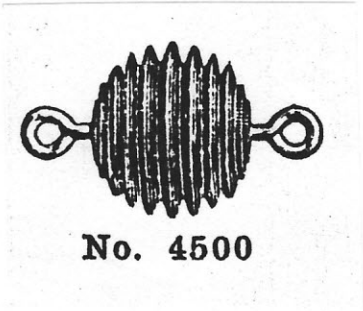


Figure 3

In the teens, the U.S. Army Signal Corps adopted several Electrose insulators as its standards. IN-2, shown in Figure 3, is the Electrose No. 4500 ball insulator. IN-4 is listed as an Electrose mast bottom insulator.(11:27)

IN-63, shown in Figure 4, is a small pin type insulator used for signaling. In 1942, one section of the army acquired 167,000 of them!(12)

However, during World War II, a problem with Electrose insulators developed. One of the key ingredients, shellac, became listed as a critical material (remember that most lac comes from SE Asia). As such, there was a need to consider conserving it for making other critical war materials instead of insulators.

During the first part of 1943, The Materials and Finishes Substitution Section at Fort Monmouth, NJ, studied replacing the Electrose IN-63's with wet process porcelain units. The section acquired wet process insulators from Hartford Faience Company and tested them against the Electrose units. In the tests, the porcelain insulators performed equally well. In addition to conserving shellac, the porcelain units were available for $.30 each as compared to $.43 that the army was paying for Electrose.

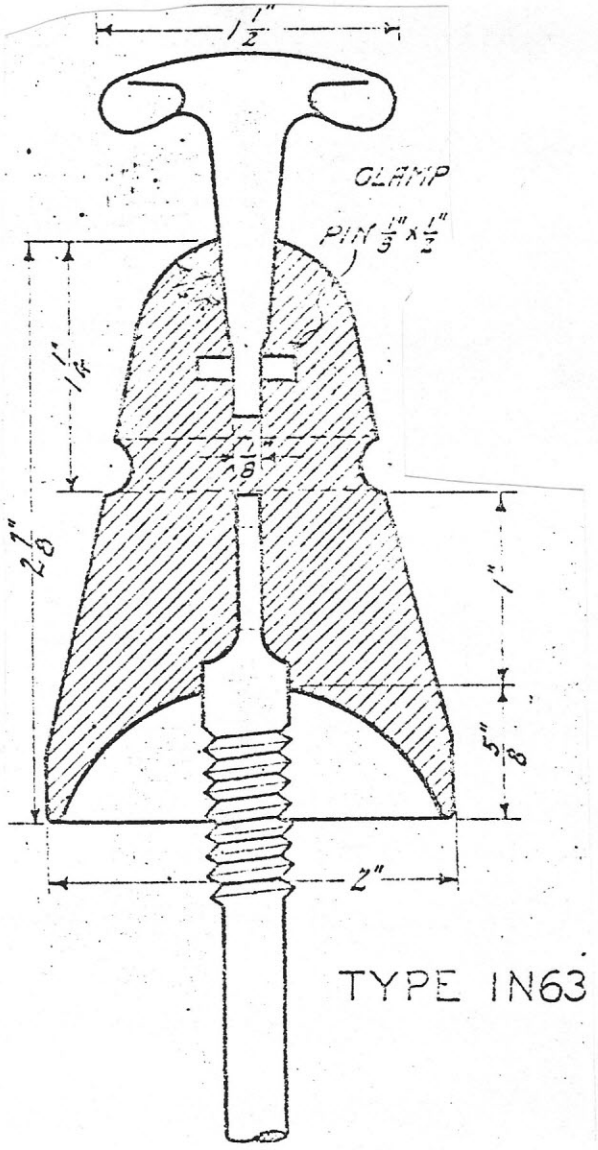


Figure 4

In a letter dated May, 1943, the section recommended the substitution of wet process porcelain for Electrose and recommended that the drawings for IN-63 be revised to specify the change.(12)

Later History of Electrose

About 1929, the name of the company as changed to Insulation Manufacturing Company, Inc. (13:4825) However, as shown in Figure 5, the company retained its familiar lightning bolt Electrose trademark.

Insulation Manufacturing Company, the makers of Electrose should not be confused with Insulation Manufacturers Corporation. The later company was founded in 1927 in Chicago, but it made insulation rather than insulators. Ads, and a catalog for the company that I have seen, show that it specialized in varnished paper, wire insulation, and was a jobber for a variety of concerns including Corning's Fiberglas insulation products.

The Electrose company may have also done business as "Electric Insulation Company" in the 1940's (3:59)

It is not clear to me what finally became of the Insulation Manufacturing Company. Business registers continued to list the company at its Brooklyn address through the 1950's. Probably the development of inexpensive alternative products and declining market share finally caused it to close.

Collecting Electrose Insulators

While they may not be as common, or attractive, as glass or porcelain strains, many of us have chosen to include composition insulators in our collections. I have included a picture of Walt Lehnert's collection of composition insulators (Figure 6) which shows several Electrose strains. Electrose Insulators from Bob Dennison's collection are pictured in color on page 13 of the February, 1996, Old Familiar Strains.

Conclusion

Yes, I deliberately chose composition insulators as the starting point instead of the more common materials. Among our readers I count recognized experts on both glass and porcelain insulators. I hope that the installments on those materials will be prepared by those whose expertise far exceeds my own.

Sources:

1: Barringer, Lawrence E, "Molded Insulation," *General Electric Review* Vol. 30 No. 8, Aug. 1927.

2: Miner, Douglas F., *Insulation of Electrical Apparatus*, New York: McGraw-Hill, 1941, 1st edition.

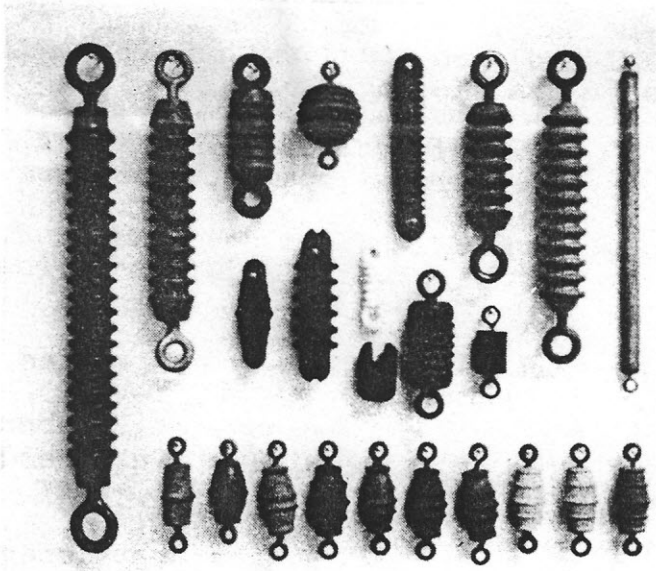
3: Leyson, Capt. Burr W., *Plastics in the World of Tomorrow*, New York: E.P. Dutton, 1945.

4: Brady, George S., & Henry R. Clauser, *Materials Handbook,* New York: Mc Graw-Hill, 1977, 11th Ed.

5: Leighou, Robert B., *Chemistry of Engineering Materials*, New York: McGraw Hill, 1931, 3rd ed.

6: Shugg, W. Tillar, *Handbook of Electrical and Electronic Insulating Materials*, New York: IEEE Press, 1995, 2nd ed.

COMPOSITION RADIO ANTENNA INSULATORS



At the left above and below is shown the collection of Walt Lehnert of composition radio antenna insulators. The key is below. Walt also has a large collection of glass and porcelain insulators of this kind. Thanks for nice picture, Walt.

5209 Minnehaha Blvd
Minneapolis Minn.
55424

1 2 3 4 5 6 7 8

9 10 11 12 13 14

15 16 17 18 19 20 21 22 23 24

1-2-3-4 "Electrose" Electrose Mfg Co Brooklyn NY - from ad in Aug 1922 QST -

5 Phenolic?

6-7 Imitatim Electrose

8 Rubber (soft)

9-10 Hard Rubber

11 Polyethylene

12-13

14 — "Egg" type -

15 - "Hopewell"

24 - American Hard Rubber Co "Radion" Brand.

Figure 6

7: *Yearbook of the Institute of Radio Engineers 1929*, Institute of Radio Engineers, New York: 1929.

8: Gish, Elton, "Hewlett Suspension Insulators," *Crown Jewels of the Wire,* May 1997, pp. 20-33.

9: "Some tests of Amateur Antenna Insulators," *QST* 5/23.

10: Chesson, F.W., "Eletronic Military Equipment: Naval Equipment Manufacturers," *AWA Review,* Vol. 7, 1991, Holcomb, NY, pp. 69-89.

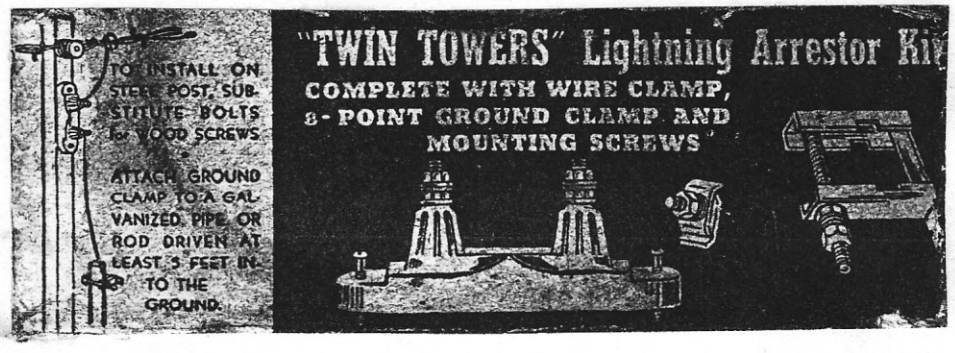
11: U.S. Army Signal Corps, *Radio Pamphlet No. 26,* Jan, 1921.

(sources continued on page 12).

12: "Insulator Type IN63," *Materials and Finishes Substitution Section,* Fort Monmouth, May 24, 1943 (courtesy Jack H. Tod & Elton Gish).
13: *Thomas Register of American Manufacturers,* 1929.

Photo Credits:
Figure 1, *Wireless Age*, Oct. 1920.
Figure 2, *Radio*, Sept. 1922. Courtesy of Bud Larsen.
Figure 3, *Radio*, Sept. 1922. Courtesy of Bud Larsen.
Figure 4,:Signal Corps drawing 40002A1 10/20/19
Figure 5, *Thomas Register of American Manufacturers*, 1929.
Figure 6: Brown, Gerald, *Unique Collectible Insulators*, 1975, pg. 78. Used by persmission.

Other Sources Consulted:
Conover-Mast Purchasing Directory, Fall 1948, 15th Ed., Vol. 8 No. 1
Conover-Mast Purchasing Directory. 1956, 30th Ed.
Sears Roebuck and Company catalog, Spring, 1924.
Thomas Register of American Manufacturers, 1952, Vol. II, 42nd Ed.



The Twin Towers Lightning Arrester
by Steve Coffman

[Steve Coffman was kind enough to put together a follow-up article on the Twin Towers lightning arrester. Steve has added some interesting facts to the story that was presented in the December 1996 OFS and continued in the last issue.]

The Twin Towers lightning arrester is the most well known fence lightning arrester. It was originally sold by the Accessories Manufacturing Company . I am not sure of its date of introduction, however anything mentioning "Accessories" is no older [newer] than the 1950's (1). Sometime in the '50's, Farris- Burns purchased Accessories and sold the lightning arrester under their name. At one point F-B retooled the lightning arrester mold resulting in a "thinner-slimmer" arrester. The difference can be seen if you place a modern arrester along side an old one.

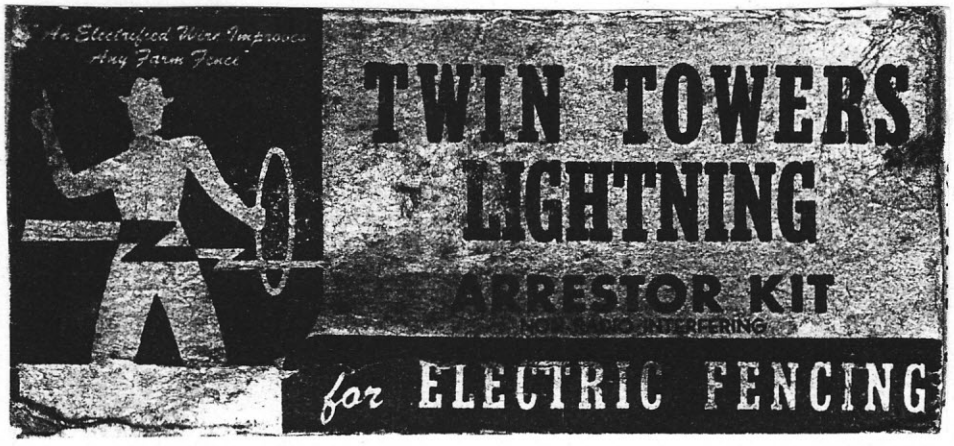
While the Twin Towers is the unquestioned best seller, it isn't the only arrester on the market. A Chinese copy is being sold, as well as a German lightning [blitzen] arrester (2) that looks like a Fleron Sentinel. Another porcelain arrester was sold at one point in the 1940's. If anyone has an arrester that can't be verified as being used on radio, please let me know. It could be the unknown other arrester. The Accessories arrester was marked either "Chicago" or "Kansas City." The F-B arrester is marked "Chicago."

Sources:
1. Information courtesy of Bob Wilson Jr., President, Dare Products.
2. American Farmworks Catalog.

Epilogue
by Dan Howard

Last week I found that the local Builder's Square hardware store sells the Farris-Burns Twin Towers lightning arrester. The box, reprinted on the previous page shows the the arrester is actually sold under the Fi-Shock Inc. name. However, the arrester is marked Farris-Burns. Like the Accessories arresters, this unit was apparently made in both Chicago and Kansas City as mine is marked Kansas City. It is the same size as the Accessories units in my collection.

These must not be big sellers. My arrester is rubber stamped June 10, 1994. All of the boxes on the shelf at the time that I bought it were covered with dust. If you can't get these locally, let me know. They run $8.56.



Current List of Glass Strain Marks

Guys, we really need to get going again on our strain insulator cataloging project. I would not be exagerating if I said that I have dozens of different glass insulators to trade just languishing in my attic. And I know what kind of reaction I would get if I told you that 2/3 of them are unmarked - ho hum, what a pain in the neck, can't tell if I need it or not....

Unmarked insulators are one of the real banes of our hobby. Without a good cataloging system, we are left with the arduous task of sketching or shipping insulators on approval - neither one an intelligent way of disposing $.25 or $.50 insulators.

Well, enough already with the commercial. With that in mind, I would like to share a list of glass strain insulator marks along the with manufacturer (where known). Please send along your own list of other marks and we can at least begin to account for the marked insulators in our collections.

A.G.K. - A.G. Kaufman (OFS Vol. 3 No. 1)
B.G. Co. - Brilliant Glass Company (OFS Vol. 3 No. 2)
Consolidated -
D.C.J. - D.C. Jenkins (OFS Vol. 3 No. 1)
Fleron - M.M. Fleron & Co. (OFS Vol. 3 No. 4)
Insulaglas -
Knox - trade mark of Knox Porcelain Company
L.S. Brach - Leon S. Brach Mfg. Co. (OFS Vol. 2 No. 4)
Ned. Fabr. - made in The Netherlands (mfg. unknown)
New Yorker -
Pyrex - Corning Glass Company (OFS Vol. 2 No. 2)
Tecco -
Tufglas - Russell B. Cressman, New York
Vitrox - Radio Products Company (Popular Radio 8/26 pg. 391)

What can you add to the list? How about porcelain marks?

More About Rubber Insulators

In the December issue (page 15), I mentioned the soft rubber insulator that was given to me. The photo of Walt Lehnert's collection on page 11, item 8, shows an insulator like mine. My benfactor recently wrote with the following additional information.

"This came from the estate of a former surplus dealer. A fellow collector told me that they were aircraft antenna insulators but this may have been purely speculation on his part. The size would indicate that if they were antenna insulators, these would only be for small aircraft where the antenna might be only 10-15 feet long. Some aircraft used a short wire antenna for LF AN/Beacons or VHF reception (about 5' long) - maybe these could have been used there." H.M. 4/97

Classified Ads

For Trade

Glass, porcelain, and mica strains. I am looking for E.F. Johnson, Pyrex, and military insulators of any type. I have the same for trade or a variety of other items including lightning arresters. **Dan Howard**

Wanted

Wanted all types of composition (mica) insulators. **Rick J. Bentley**, White House Canyon, HCR 32 Box 205, Datil, NM 87821 (505) 772-5627.

Upcoming Events

July 25-27, **Chicago, IL**, NIA National Convention, **Rick Soller** (847) 855-9136 or **Bob Stahr** (219) 365-4171.

August 9, **Portland, OR**, Insulator Sale, Swap & Picnic, **Dan Howard** (503) 761-7799. (Yes, you saw it here first! All are welcome - please RSVP, if possible. I envision an informal backyard swap to include strains, pins, go-withs, digging through my boxes of spares, show-and-tell, food, etc.. Call for directions, details)

September 26-27 **Albuquerque, NM**, NIA Western Regional Show, **Rick Bentley** (505) 772-5627.

Show Reports

May 3 - Enumclaw, WA Northwest Collectors Show and Sale by Gil Hedges-Blanquez

Gil reports that the show went well with most of the usual "suspects" showing up. The show boasted three insulator displays with two of the three featuring foreign insulators. The third display compared glass insulators with glass bottles of similar color. Gil brought home a few new strains including a 5" black glazed porcelain strain. Another strain? was a cobalt blue glass "bead" that came his way. Gil says that it was almost black with dirt but that it cleaned up beautifully. He also acquired a nice 3" aqua glass strain. All that and good company, too. What more could one ask for?

May 10 - Portland, OR NWVRS PARC Joint Swap Meet by Dan Howard

The local antique radio club recently co-hosted an 80-table swap meet with a local ham club. As I have pointed out before, such meets can be an important portal for networking. A number of fellows approached me who had noticed my sign at previous swap meets and had been looking out for insulators for me. I was tickled to get a number of new items for my collection. A local ham gave me several new Johnson strain and spreader insulators (although they aren't pretty they certainly help my research efforts - one was a completely unknown type to me). Another fellow came a long with an assortment of 8 insulators which immediately caught my eye. There was the first Brilliant Glass insulator that I had ever had the chance to buy. Also nestled in the group was a beautiful dark purple insulator and a nice bubbly sage blue. I also got a nice box of commercial radio magazines from the 1940's which were full of ads from insulator manufacturers. In short, don't miss chances to attend a radio swap near you - you may be pleasantly surprised.

Novel Insulator
[Author's name withheld due to shame]

A good friend and long time reader wrote me a letter shortly after I was given the responsibility of editing Old Familiar Strains [oops, I gave myself away]. In it, he suggested that a good approach would be to focus the articles on glass insulators, especially older styles. Unfortunately, this article does neither. So, shoot me.

I enjoy displaying a variety of strains from the earliest glass or hard rubber models up to [gasp] the vinyl creations that are sold new today. Consequently I have copied and saved articles of all types relating to strains.

A number of articles by hams and others have explained how they can make insulators "cheaper and better" than the store bought ones. After all, if you can cobble something together out of the junk box instead of spending a dime to buy an insulator engineered for the purpose, wouldn't you? Some of these novel insulators are really something.

Since it's been a while since the article on the bottle-stopper strain, I figured that I could get away with publishing another article on a novel insulator.

One of my other pastimes is golfing. So I was intrigued when I saw the following article on making an insulator from a golf ball. Unfortunately, I lost the reference for the article, but I believe that it was from the teens.

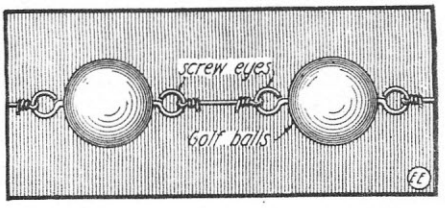
Screw-eyes were no problem, but it seemed rather cliche (and expensive) to use a new golf ball for the project. So I filed the article. Last week while pawing through a box of 29 cent used balls at the thrift store, I found a pair of "Blue Flash" brand balls. It seemed so poetic. Using a golf ball insulator on a transmitting antenna would almost certainly result in a blue flash! So I bought the balls and made my insulators.

If you wish to follow suit, I found that a toilet paper roll makes an excellent jig for holding the ball while drilling. If you are not too ashamed to admit it, write and let me know what brand of ball you chose to use for your project.

GOLF-BALL AERIAL INSULATORS

A very good aerial insulator may b made from a golf ball, the solid gut percha kind being the best.

First, it may be well to remove the paint, because it acts like a conductor, due to the lead in the paint; it may be done by applying a coat of paint remover. This accomplished, take a small drill and at opposite ends drill holes a short way in. Now take a few brass screw-eyes and



Golf Balls Prove Good for Insulators.

thread them in the holes made, being careful that they do not touch at the center. By following the drawing, all points will be made clear. These insulators will be found to be very strong and also will resist fairly high voltages. Several may be joined in series to increase the insulation value. Contributed by

F. PELTON.