Radiola II Batteries

What did they look like?

Five months to get a good answer.

By:
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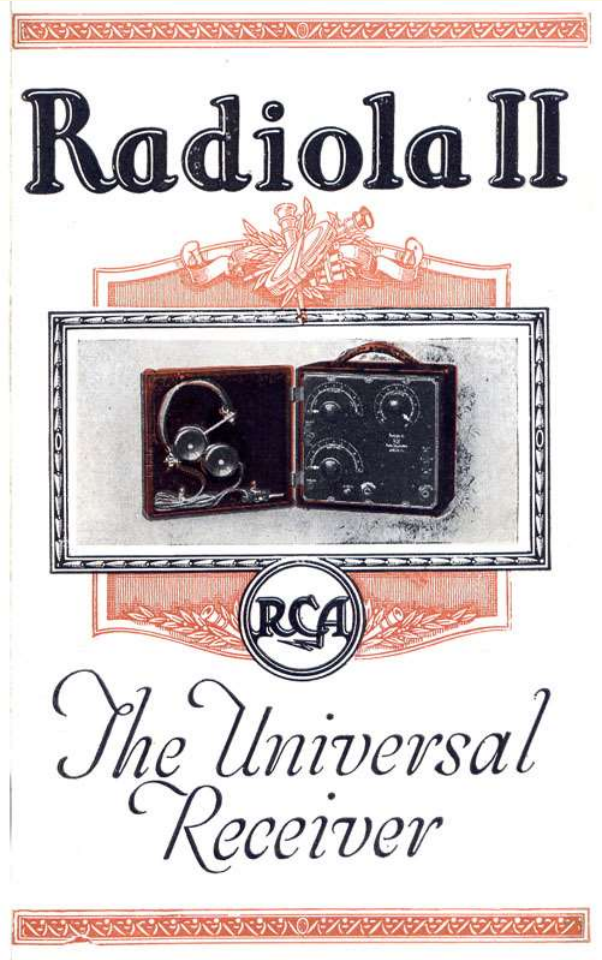
Radiola II – RCA's first attempt at a fully self contained vacuum tube portable radio.

Announced in December, 1922 but not sold till late January 1923 or nationally advertised until June 1923.

Alan Douglas reports that GE built 9594.

Eric Wenaas research indicates slow introduction due to RCA needing to clear unsold inventory of 1922 GE designs and low yield production problems with the UV-199 in early 1923.



Back cover **RADIO NEWS** September 1923

For just $97.50 with tubes, headphones & batteries included, you were ready to add radio to your outdoor adventure.

The CPI Constant Dollar Calculator says that is equivalent to $2,014 today!

Still they sold almost 10,000.

Now for Camp
with the new
Portable Radiola!
(Radiola II)

HERE'S a Radiola you can pick up and trot off with! In a cabinet that holds the headset, the tubes, and all the batteries. With a handle to carry it by. Think of taking your Radiola with you—tuning in almost anywhere, at any time, on half the country's broadcast programs.

Now for camp life with a Radiola! Music at the evening campfire. Baseball scores. Songs, news, talks, going with you wherever you go.

Throw an insulated wire over a tree, and you are ready to listen in to far-away cities. Radiola II is a powerful receiver with two tubes. The secret of its smallness is the new Radiotron UV-199, that operates on ordinary little flashlight batteries!

One thing that will impress the family is the fine appearance of the set for home use, when you take off cover and handle. It's a portable receiver—but, first of all, it's a fine receiver, and a sensitive one.

"There's a Radiola for every purse"
at the nearest Radio or Electrical Store

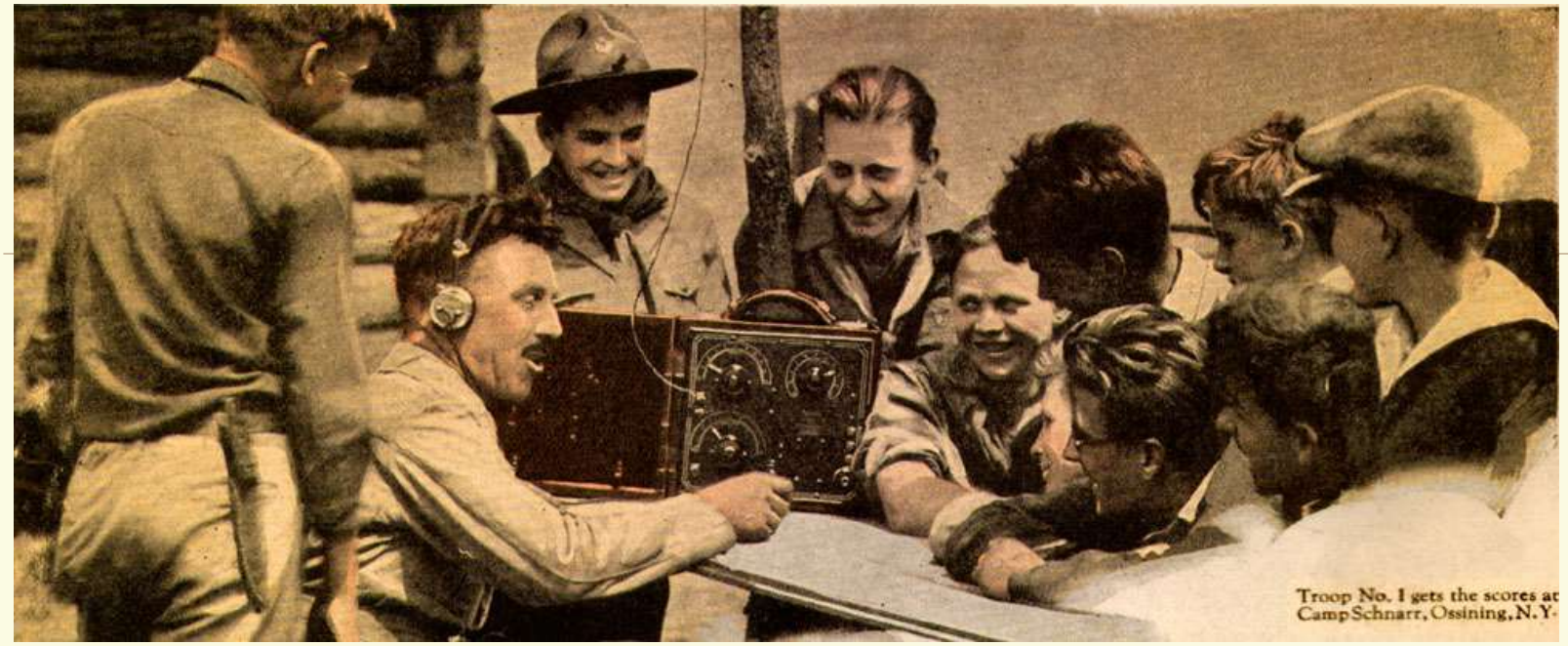
Radiola Portable
Regenerative tuner; two tubes—Radiotron detector and one stage of audio amplification; all batteries and a pair of head receivers. $97.50
Turn a knob—and tune in—mighty simple. Vernier attachment for fine tuning. Receives long distances with the headset, nearby stations can be heard through a loud speaker.

Send for the free booklet
Radiolas from $25 to $350. Write for the booklet that tells all about 'em.

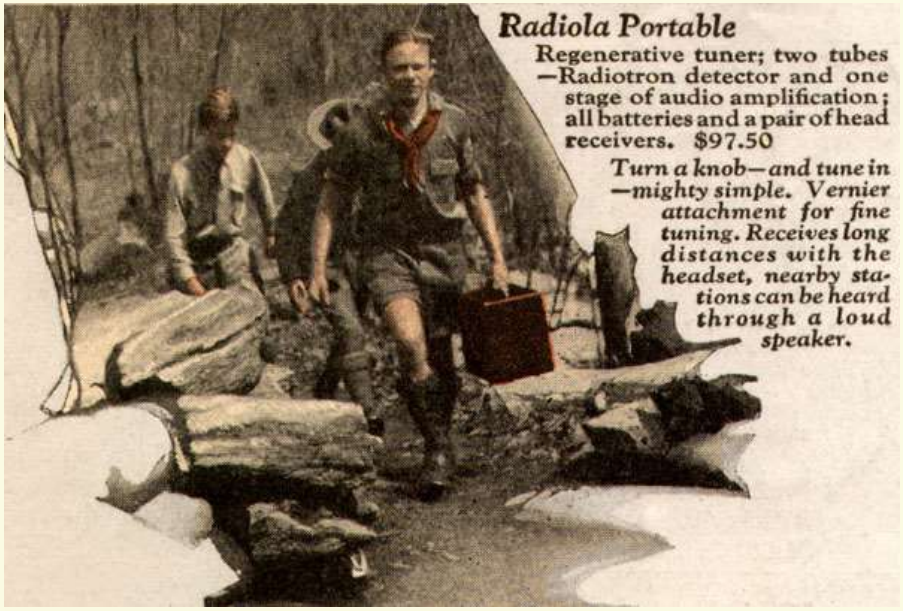
RADIO CORPORATION OF AMERICA
Dept. 1065, Address office nearest you.
Please send me your free Radio Booklet.
This symbol of quality is your protection
Name
Street Address
City R. F. D.
State

Radio Corporation of America
Sales Department 233 Broadway New York
District Sales Offices 10 So. LaSalle Street Chicago, Illinois 433 California Street San Francisco, California

Radiola
REG. U. S. PAT. OFF.



Troop No. 1 gets the scores at Camp Schnarr, Ossining, N. Y.



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Turn a knob—and tune in —mighty simple. Vernier attachment for fine tuning. Receives long distances with the headset, nearby stations can be heard through a loud speaker.

Now for Camp

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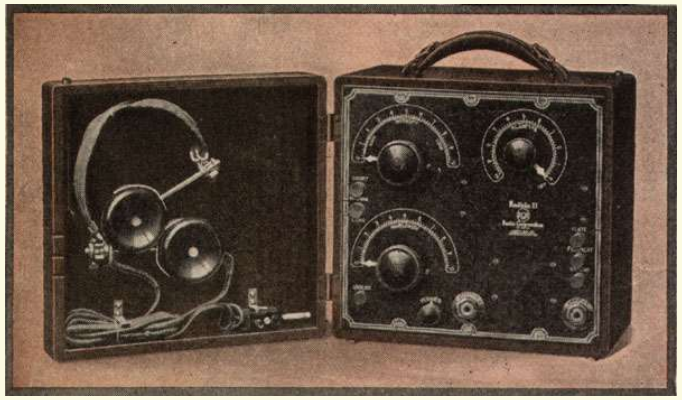


RCA & GE wanted a tube with filament that could be lighted by dry cell batteries. GE's answer was the UV-199.

Filament rated 3.0 Volts at 60 milliamperes.

Only two practical cells available to light the filament.

Three of these #6 - 1.5 Volt cells.

Each 2 5/8" diameter x 6 ¾" high.

That's too **BIG**.

The other choice, a flashlight battery.

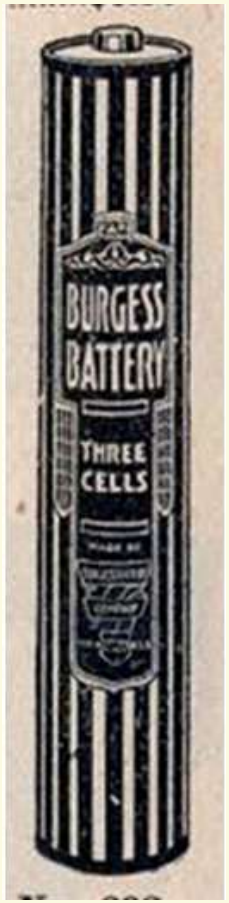
Three ‘D’ size cells in a paper sleeve. (4.5 Volt)

1-5/16” Dia. and 7” long.

Two in parallel would last 100 to 150 hours in intermittent service.

So this is what they selected for their radio.

No known examples of the Burgess 232 or actual detailed photographs.



Small ‘B’ Batteries were a problem also.
Just one choice for 22 ½ Volt when design began.
A battery for aircraft equipment in WW-I – Type BA-2

No. 763 Eveready Airplane Wireless Battery. Standardized for use in U. S. Signal Corps Aviation Section

RADIO NEWS – Nov. 1921

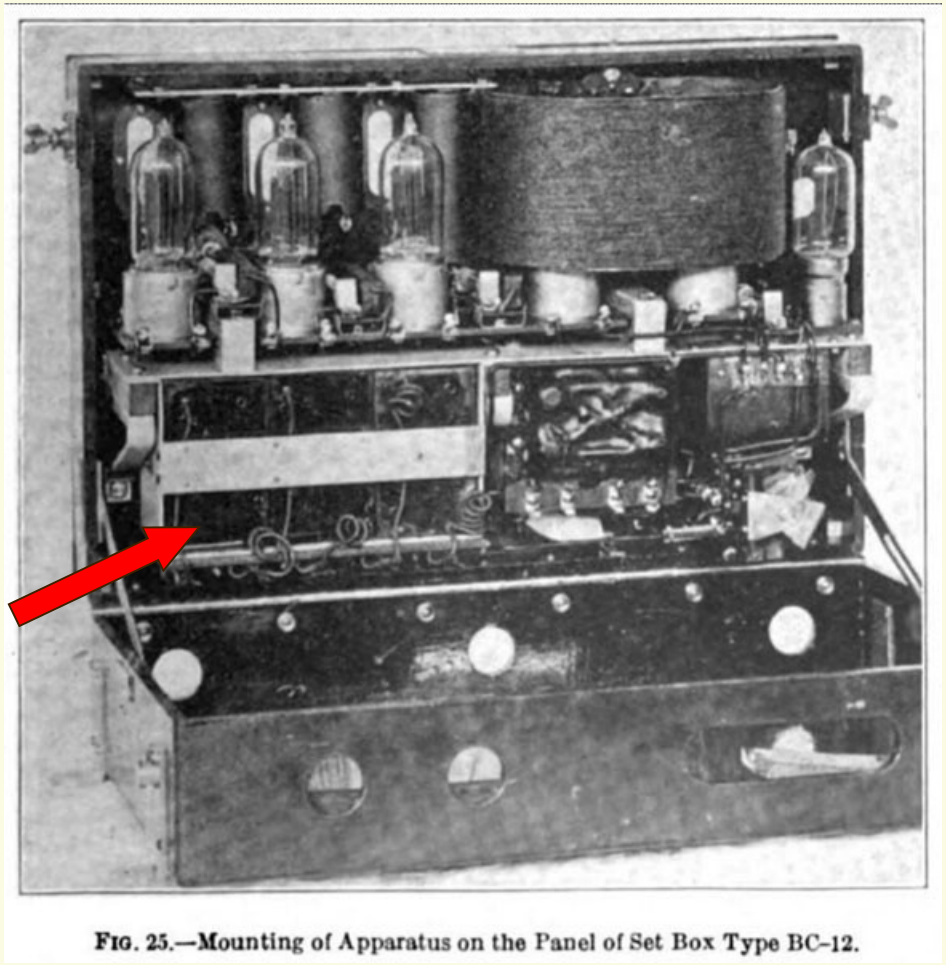


FIG. 25.—Mounting of Apparatus on the Panel of Set Box Type BC-12.

No. 766 Eveready Wireless Station Battery
Standardized for use in U. S. Navy

What makes the Eveready Wireless B Battery absolutely noiseless in operation?

Efficient depolarization; substantial connections; freedom from corrosive punctures and leaks. These are the features that give Eveready that absolute silence—that make Eveready the first choice for every receiving set.

Hitch an Eveready to your set—enjoy the marked increase in the effectivness of your equipment. Radio equipment dealers everywhere—or write us.

No. 763 Eveready Airplane Wireless Battery. Standardized for use in U. S. Signal Corps Aviation Section

AMERICAN EVEREADY WORKS
of National Carbon Company, Inc.
226 Thompson Ave., Long Island City, New York
Chicago Atlanta San Francisco

EVEREADY
FLASHLIGHTS AND BATTERIES

Every wireless operator has use for an Eveready Flashlight

No known modern pictures of the Type 763 battery.

BURGESS "B" BATTERIES

No. 4156 **Price $1.50***

Size—Length, 3⅜"; width, 2"; height, 2½".
Weight, 1 pound.

Flexible wire terminals. Normal maximum voltage 22.5

Approximate capacity at 3.0 milliamperes 150 hours, but lightest in weight of the block batteries. Signal Corps Type BA-2. Excellent shelf life and light weight make it adaptable for aeroplane, portable and small stationary sets.

Earliest very small picture of Burgess 4156 in this 1924 Burgess booklet.

Eveready advertisement but no known color information. eBay to the rescue: 4 year search turns up these great photos October, 2014.

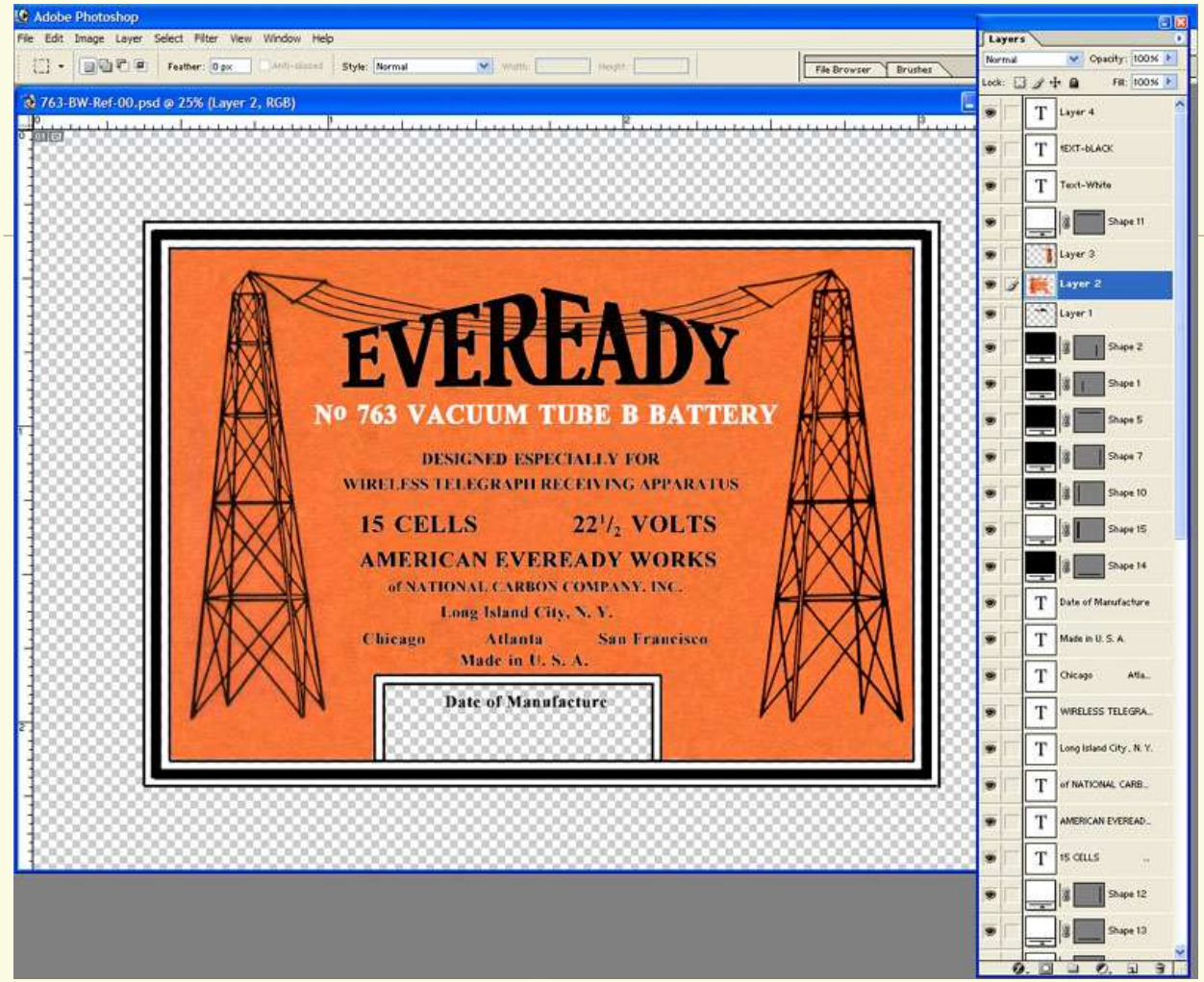
I buy the smaller # 766 battery. (Less damage to the embossed Eveready logo.)

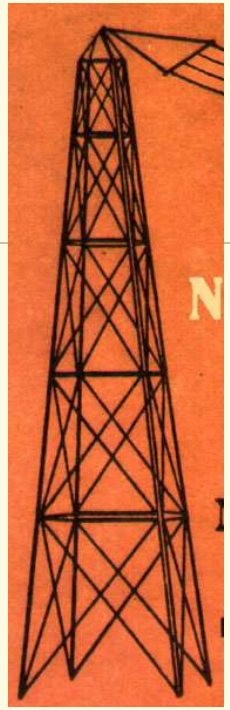
Scan at 600 d.p.i. then convert to 1200 d.p.i.

Scan advertisement image and correct perspective.

Looks awful but it has position of features information.

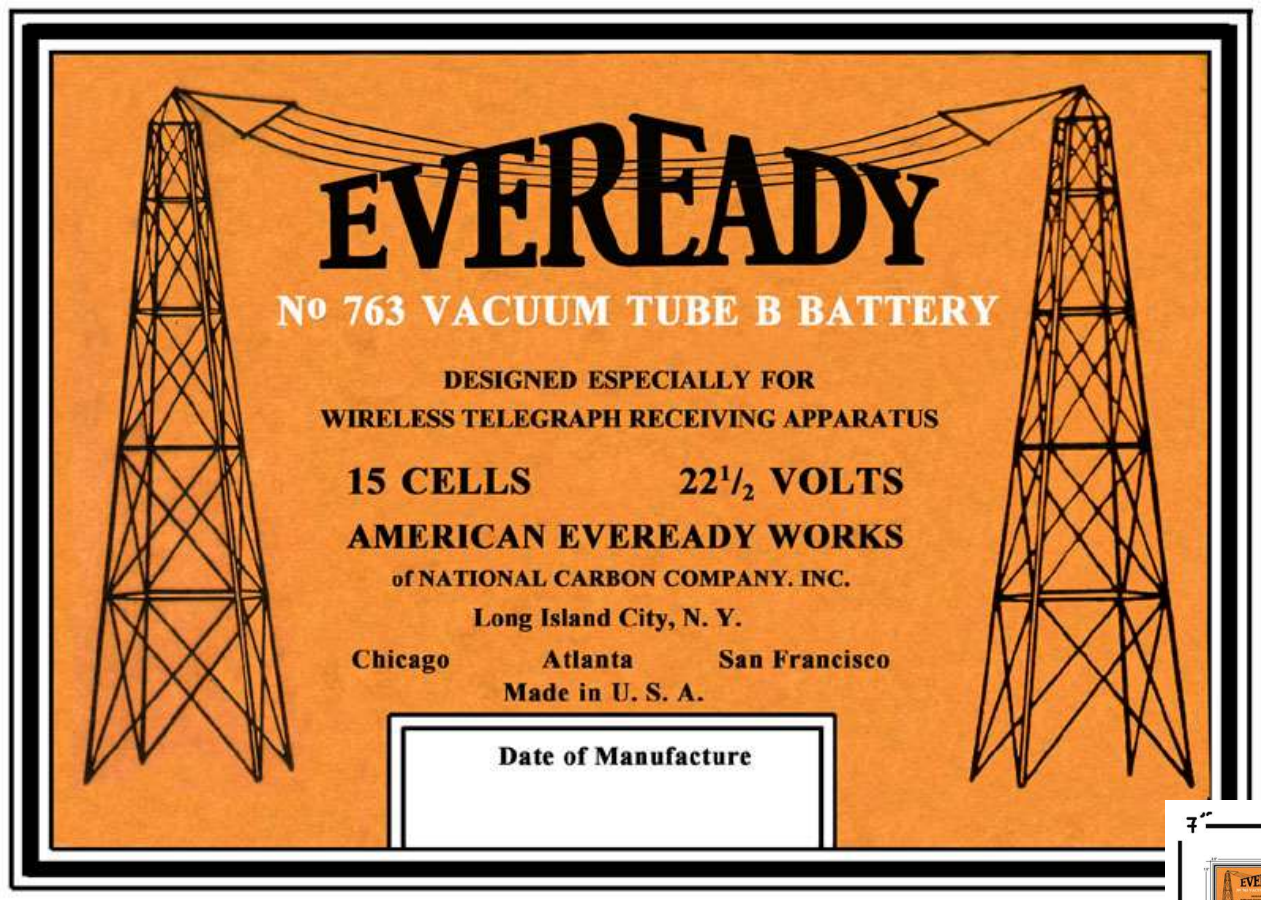
That is all that is necessary in a template image.

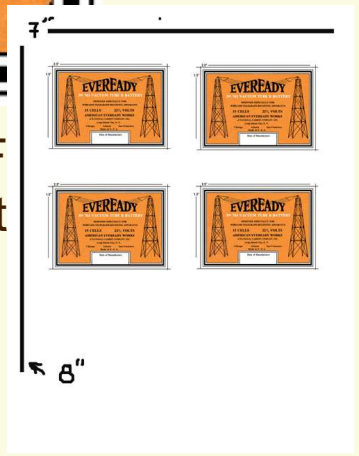




We are lucky. All text is standard Times New Roman.

On top of the B&W template you create multiple layers with lines of new text, retouched images, lines, etc.





Convert images to 600 d.p.i. resolution and print to .PDF format. This is the highest resolution for laser printers at OfficeMax or Office Depot print shops. (They can print .JPG images only at a max of 300 d.p.i.)

Always include dimension references in your image.

What is that stuff anyway ???

Hard to figure out these days unless you are a jeweler or silversmith.

The name of this stuff is Red Pitch.

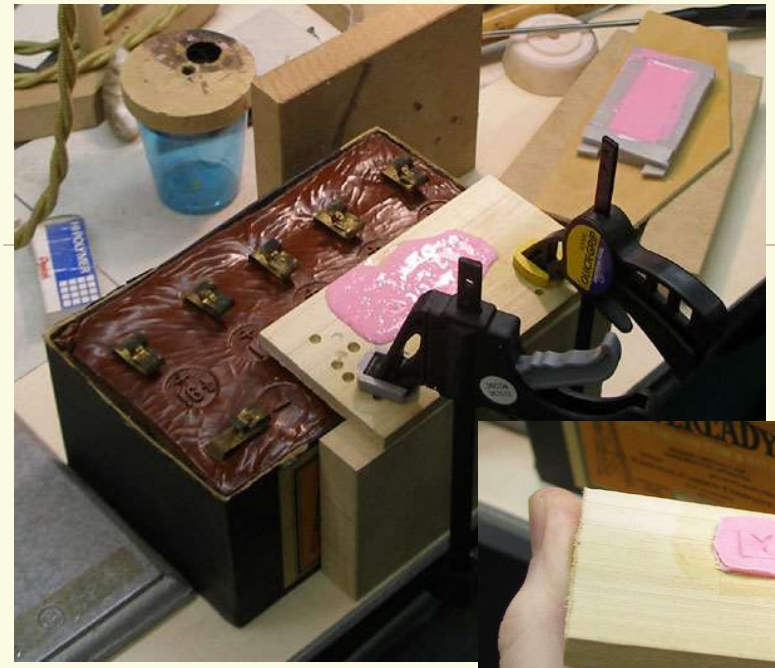
Pitch (a.k.a. bitumen or asphalt) is a heavy fraction of petroleum or coal. It is always Black.

Red Pitch is a misnomer because it is made of coniferous tree resin (amber), tallow (white) and finely ground old brick (red). It was cheap at the time but since it is only used in the artisan metalworking trades now, it is expensive. Almost $4.00 worth to fill the top of each small Radiola II battery.

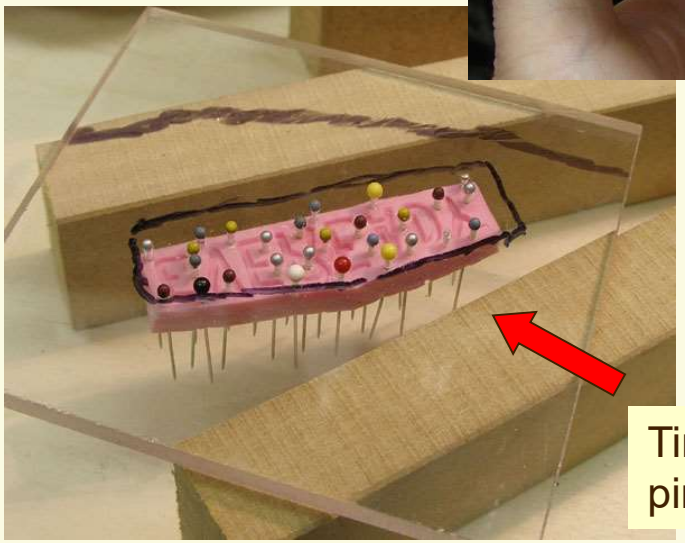
I could have cast the tops in urethane plastic as on these much larger batteries but I determined that the scale of the Radiola II batteries was such that this scheme would not appear as authentic.

Capture the logo.

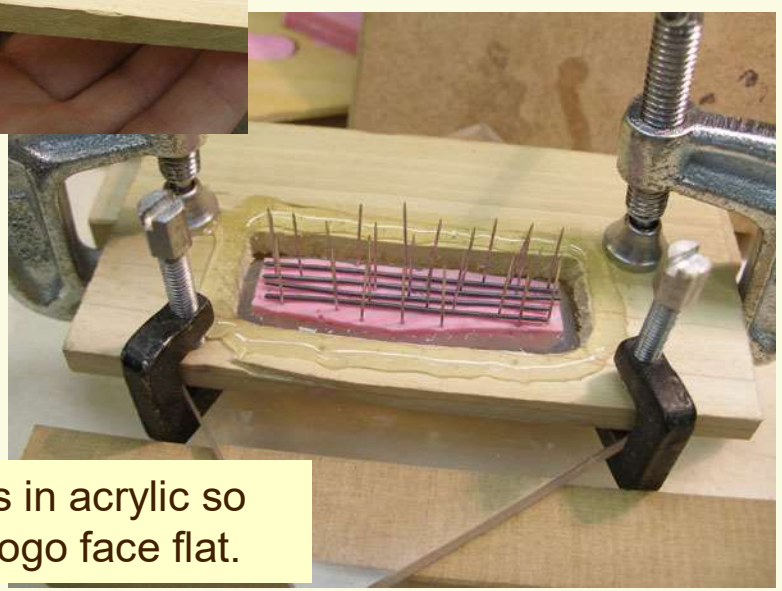
- The challenges….
- Potting material pushed up over time due to cell corrosion and heat. Mold it anyway.
- Time for a little witchcraft to flatten the logo and cast a positive mold.
- The positive mold can now be used to cast a rigid resin embossing stamp.



Anything but level.



Tiny holes in acrylic so pins pull logo face flat.



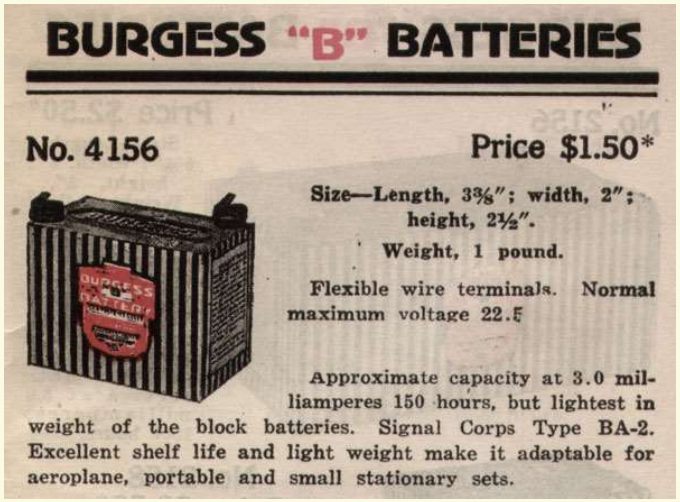
Leveled logo negative.

Cast rubber positive.

Ta-da! Rigid stamp.

It would be nice to have machined these stamps in brass but I do not have that capability. These resin stamps should be good for many impressions.

No Burgess advertisement or modern picture for their smallest battery just a catalog page illustration. But, I do have a later version of its big brother. (2 lb. size.)



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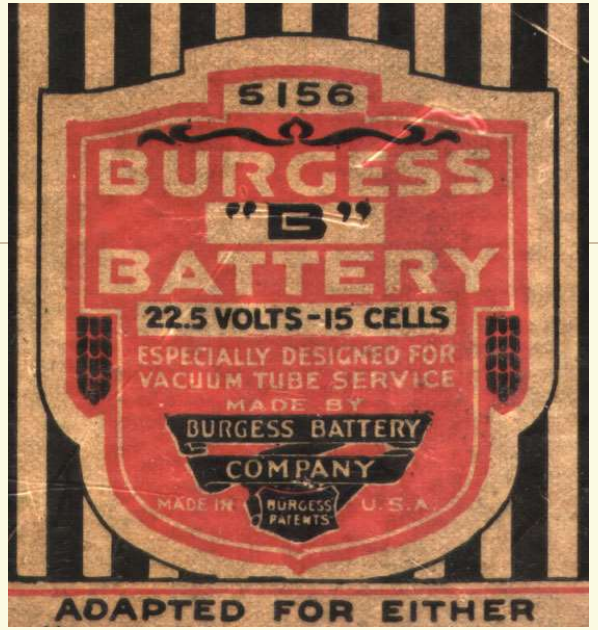
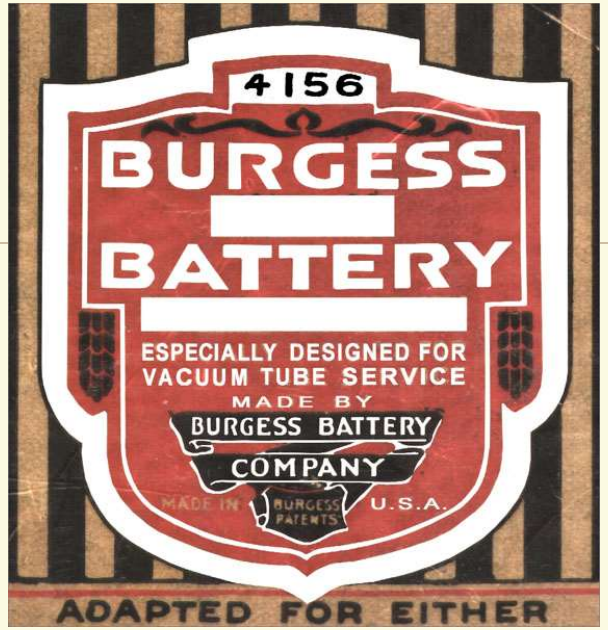
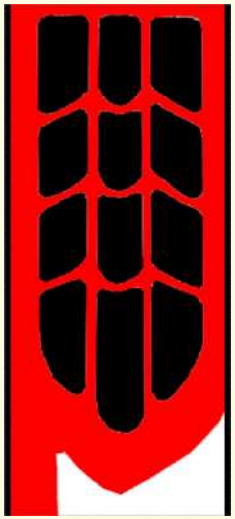
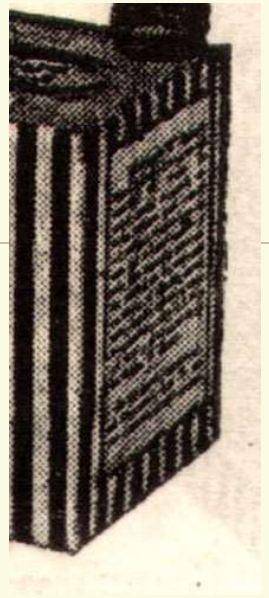


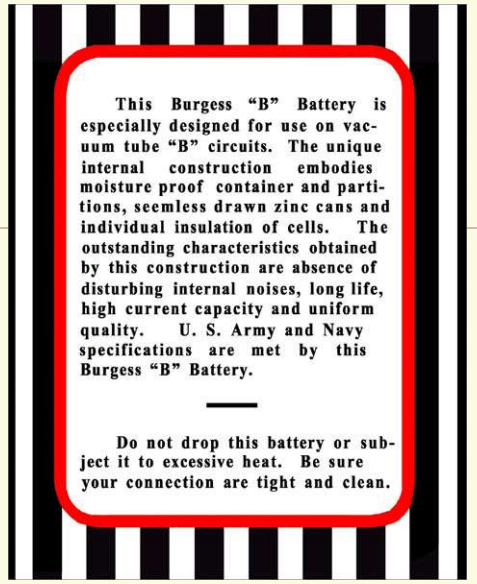
Same rituals to create graphic for printing.





At least it is close to the only known pix.

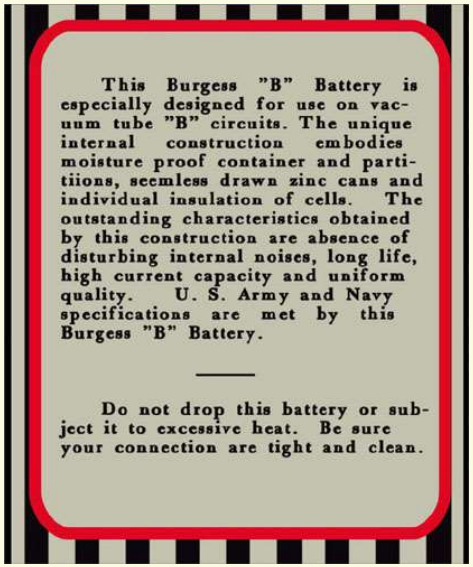


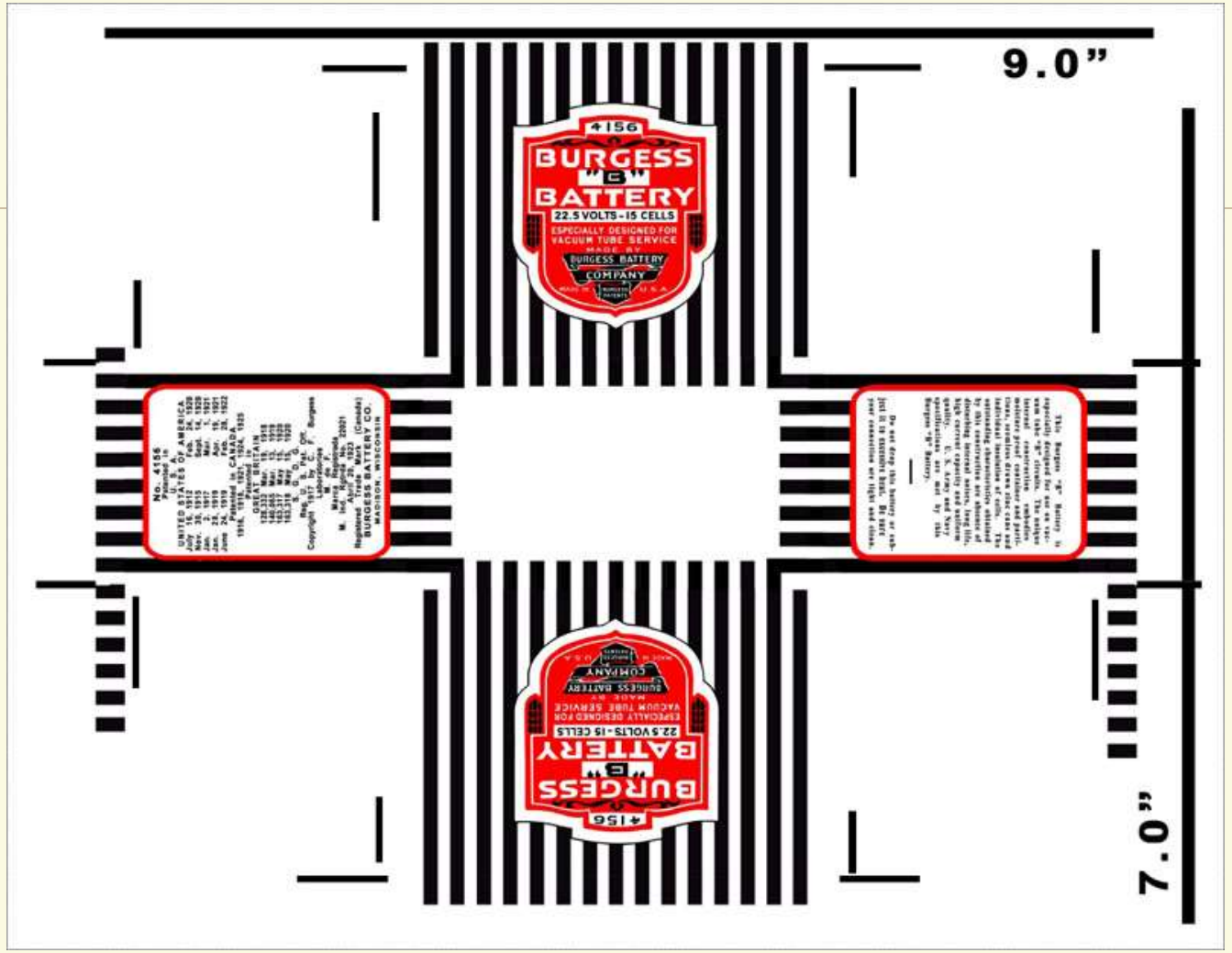


Some adjustments necessary to fit the smaller form factor of the 4156 box.

Again, fortunately the fonts were a near standard Arial that could be edited and standard Times New Roman.

< 5156 Reference Images >





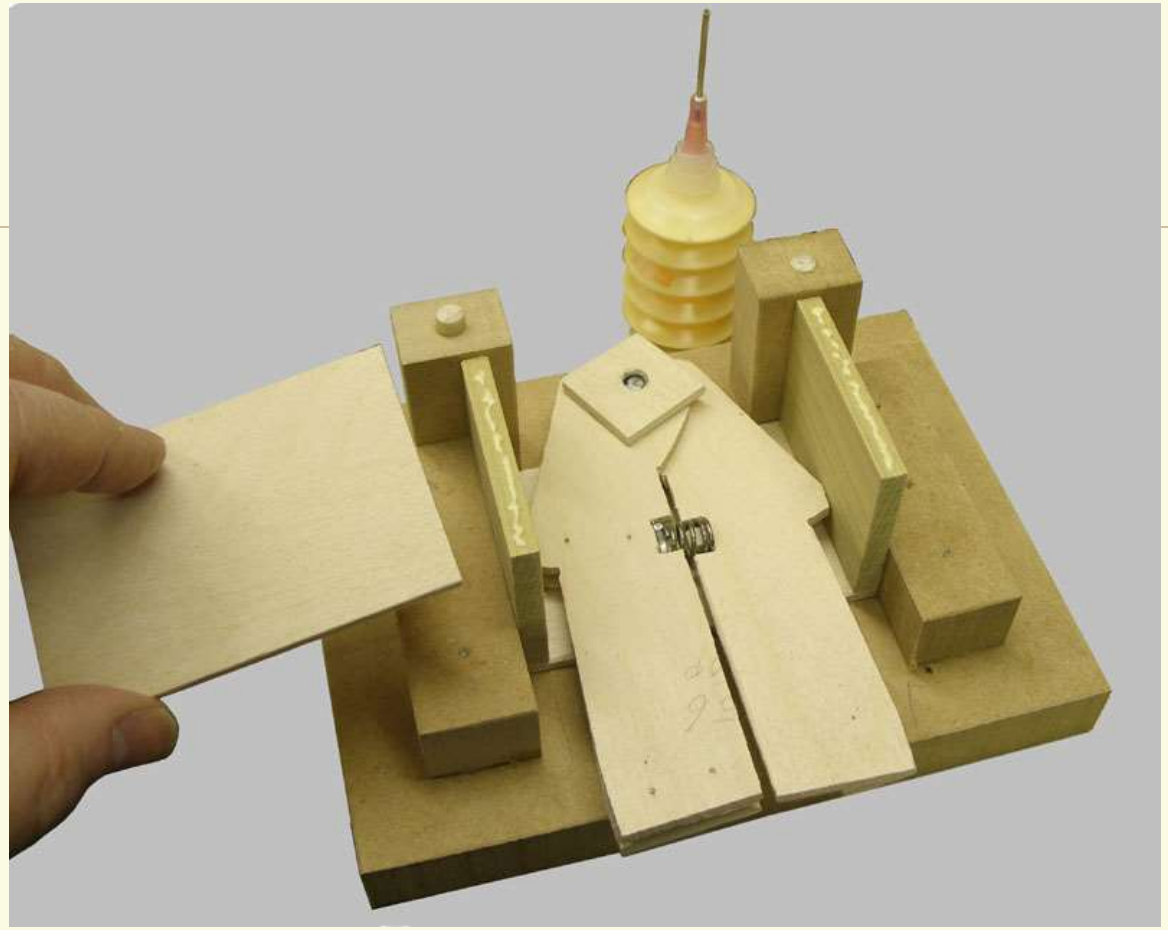
Layout done and saved to 600 d.p.i. .PDF format for laser printing.

Time to cut wood.

- It is all about getting the right set-up. When you get it right, go ahead and cut more than you think you will ever need.
- Don’t skimp on wood. Use only furniture grade 1/8” Baltic birch plywood and kiln dried poplar board.
- In my case, one 36” x 48” sheet of Baltic birch plywood gives me enough panels for 34 boxes.

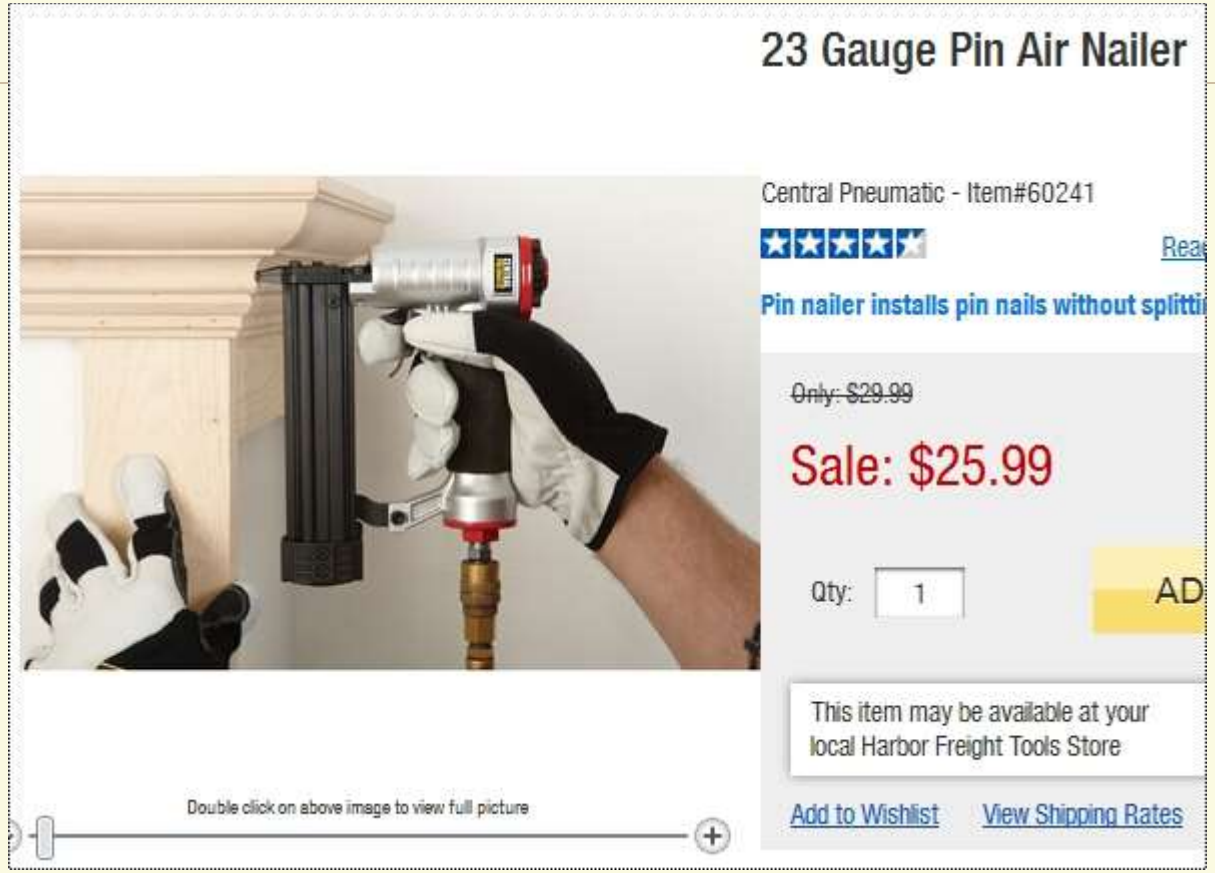
Start with a brand new wicked sharp fine tooth band saw blade.

Once you have set up your band saw rip fence and miter gauge, you can easily cut panels to +/- 0.005” and square to a fraction of a degree.



If you make more than a couple of boxes, a nail jig will dramatically speed assembly and produce absolutely square boxes. So very important when you begin to wrap graphics around the box.

I LOVE 23 gauge pin nailers!

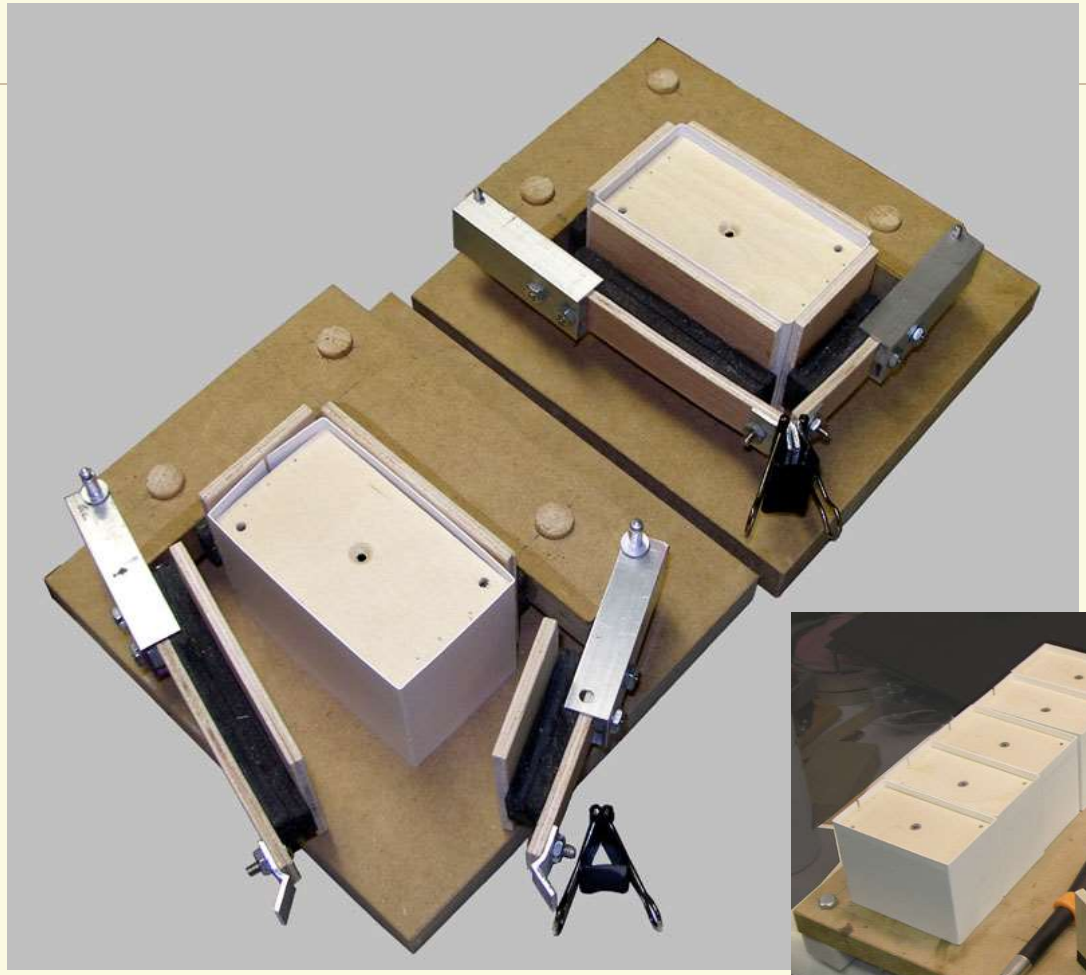


Perfect for holding joints while the glue dries. A pin so small that splitting is just about impossible even in small parts.

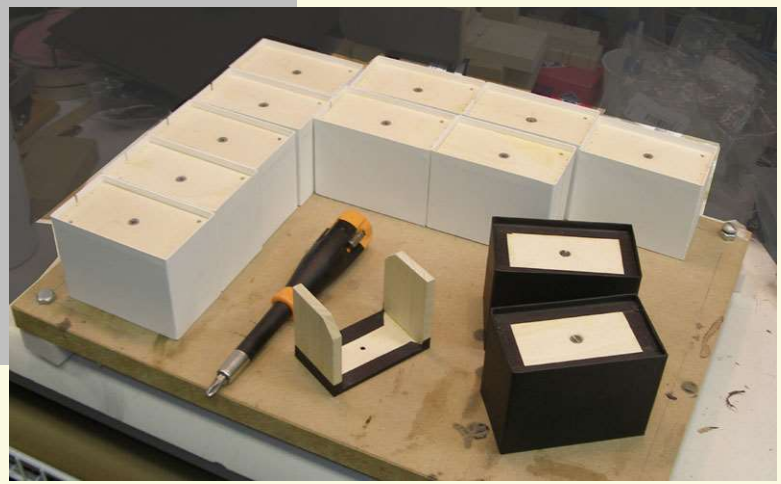
If you have a minimum of 60 p.s.i. shop air, get one!

When they stack this tight, you know you have square boxes.

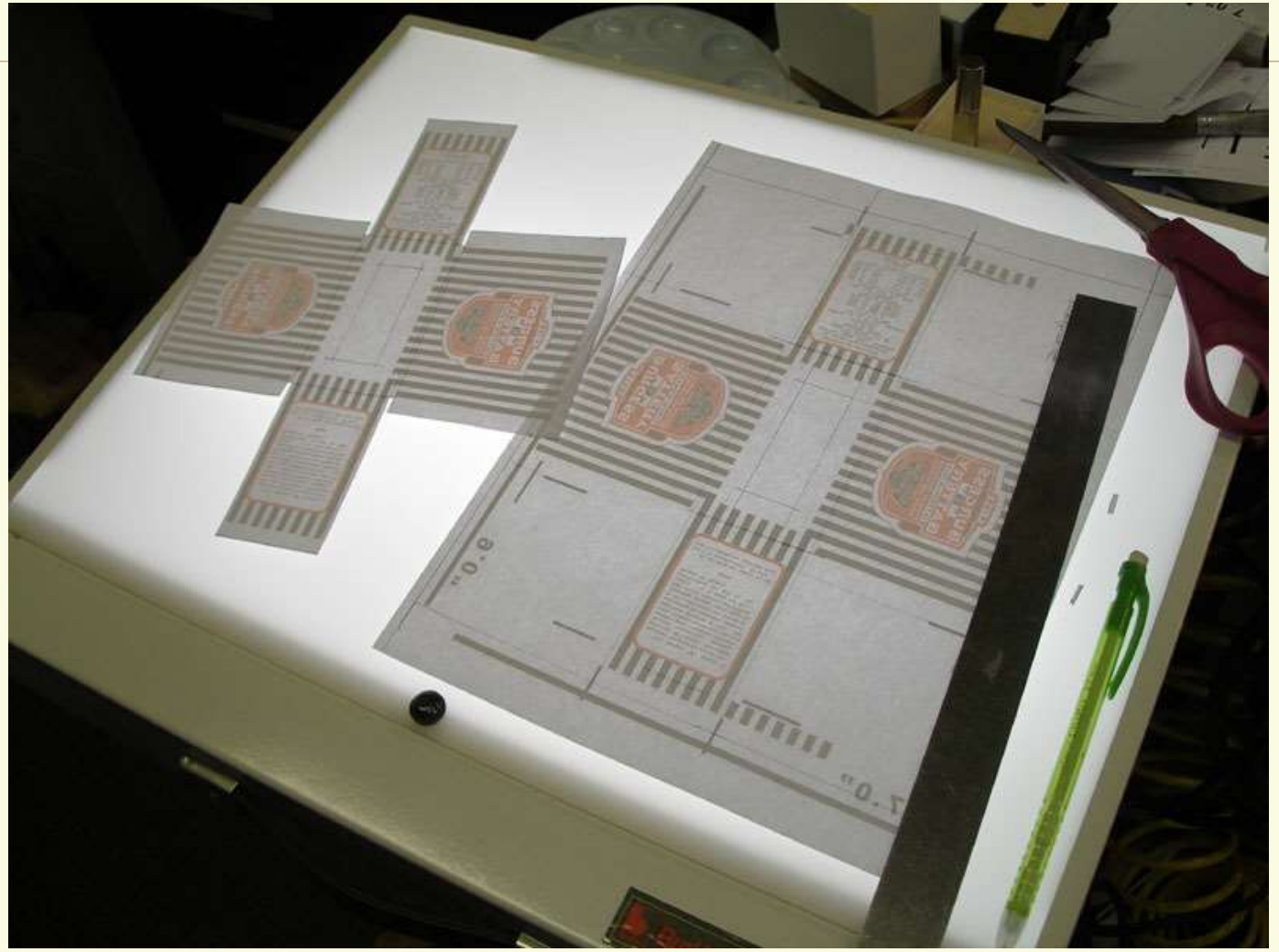
A fixture is called for…



Heavy card stock has to be glued to the box. Making two presses like this make it possible to work continuously on this task.



Wrapping the Burgess 4156 graphic takes a little more skill.



Geez… Got to make your own wire.

20 AWG – stranded – cloth braid.

But there is a way…

Cotton bead craft cord can be dyed any color.

Just pull out the core strands and fish the wire through.

Vacuum saturate wire with flexible clear coat.

Brake line bleeder vacuum pump works fine.

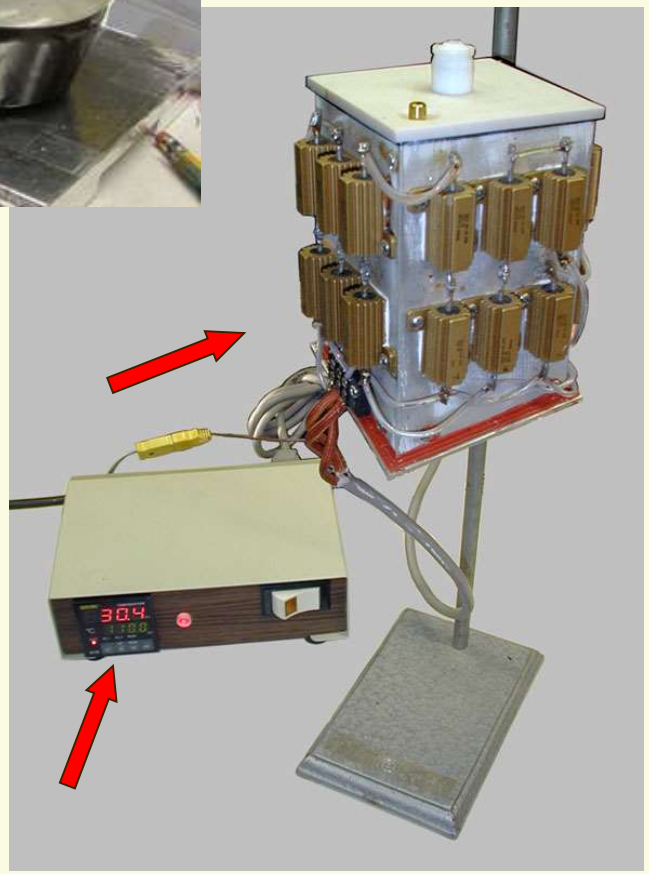
Time to pour **Red Pitch**.

Double boiler with vegetable oil heat transfer sort-of works but makes a terrific mess very quickly and is slow.

I decided to design a pushbutton Red Pitch dispenser. Works like a charm.

(Shown before glass blanket attached.)

New programmable temperature controller off eBay for less than $30! Stuffed in a junk parallel port printer switchbox.



Don’t attract attention to how clever you are at making replicas. The contrast of new & old is not going to help your exhibit.

Air brush on a little oak stain in lacquer to give it the look of ‘kind age.’

Several drops of light oak wood stain in a tablespoon of clear lacquer will tone down your brand new graphic.

Air brush highly recommended for any kind of chassis touch-up.

A replica like this needs to be able to work. We are lucky that three standard 9 Volt batteries will fit.

A brass threaded spacer and #6 flat head screw holds the bottom securely.

A card stock sleeve is glued to the inside of the box to keep wires out of the bottom cover leg space.

First batch of first generation ‘B’ battery replicas for the Radiola II.

This is only **half** the project. Now on to new challenges.

The 4 ½ Volt flashlight battery.

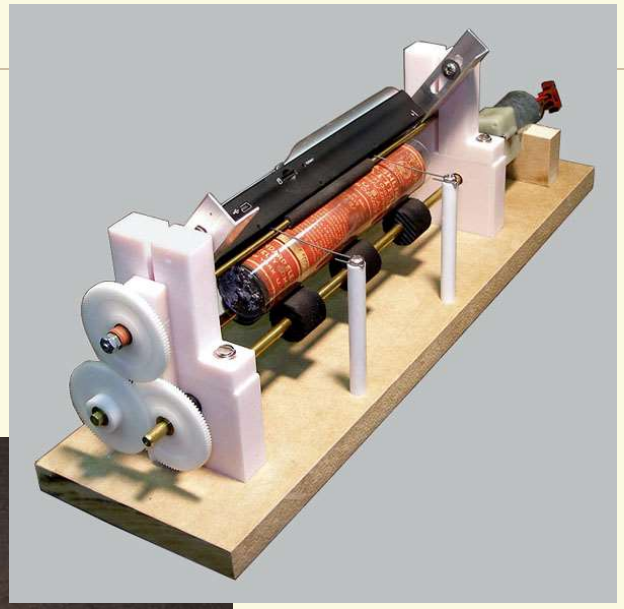
<<< The first 4.5 Volt flashlight battery I had ever seen in person. Eric Wenaas loaned me the battery for documentation. The only requirement is that I could not damage the battery by cutting off the cover to scan on a conventional flat bed scanner.

I thought I could build a round battery scanner.

And so I did.

I had designed a scanner before…

A client wanted to scan the labels on vintage wine bottles! I built 16 prototypes like this.



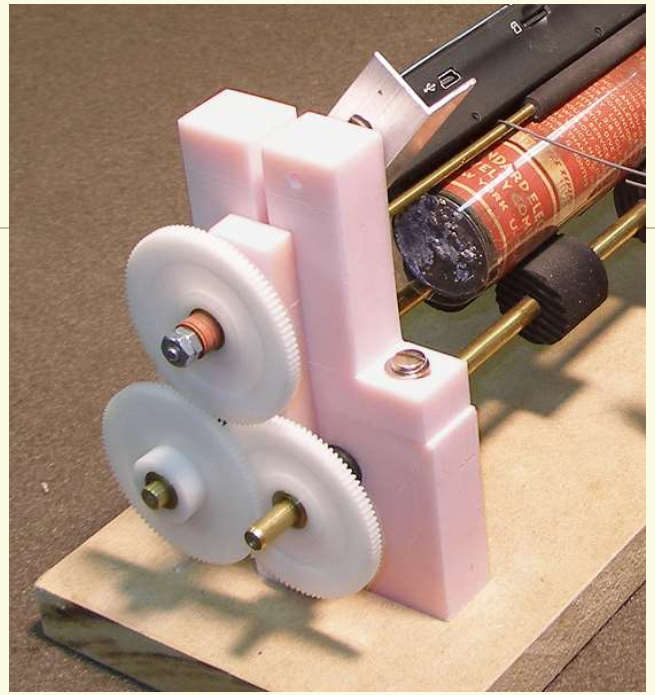
A simplified design from junk box parts, hand held document scanner & strange resources.

Precision high density foam rollers from, of all places, **Dollar General** store.

$3.00 girls wedge sandals on sale for 50% off.

Such a deal….

Easy to grind to precision tolerances in rubber or foam materials with a high speed **Dremel Moto-Tool** mounted like this…

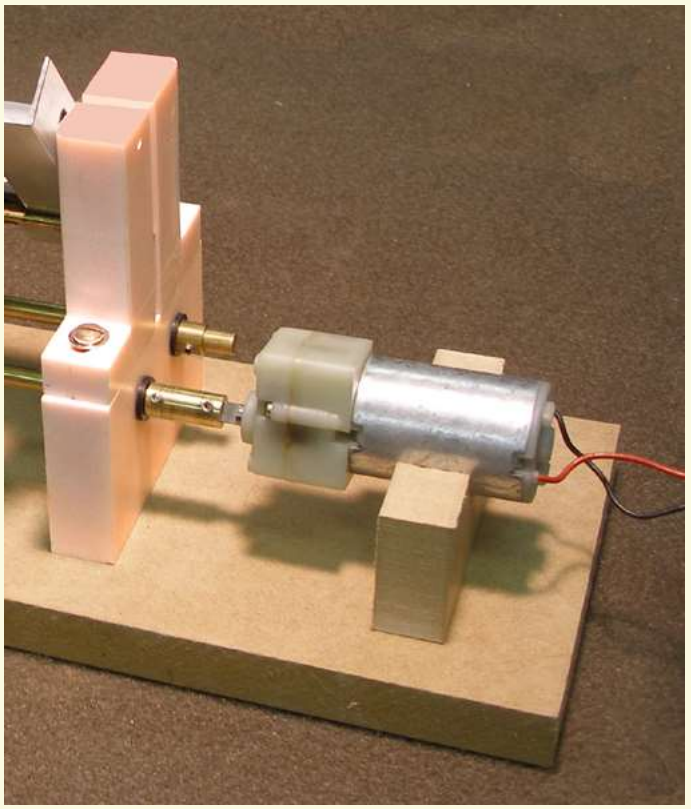


A favorite hard material for my projects. Cut from a sheet of pink **Corian** bathroom countertop found on the side of the road. (House remodel in progress…)

Things just seem to work better with at least a little pink **Corian**.

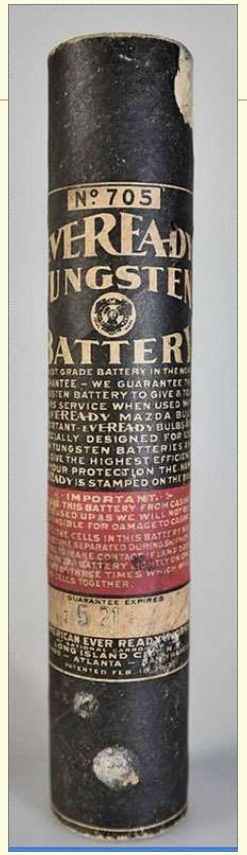
Cool 12 Volt gear motor bought at a Hamfest many years ago for probably a dollar or two…

You just never know when you are going to need one….



Same ritual…. Terrible raw scan serves as template for accurate placement of new layers of text and graphics to yield a near perfect reconstruction.

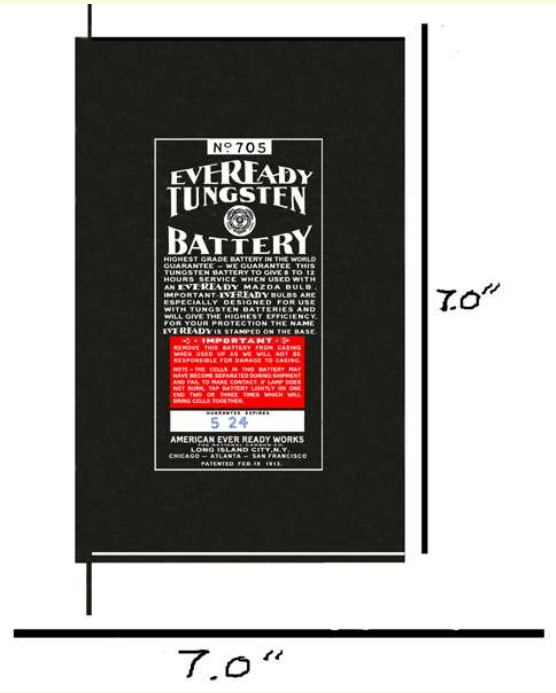
With technique proven, create desired Eveready graphics.



eBay picture of 2012 sale.

I buy 2-cell version off eBay 10/2014.

Perfect 2-cell graphic.



Scan to capture logos, etc.

Use cut and paste for logos. Edit text according to reference pictures.

High accuracy even without a #705 to scan.

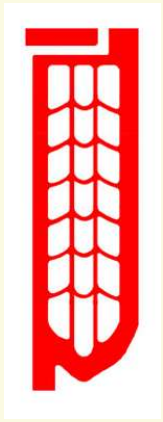
The Burgess is much harder to define.
No known modern photographs of the 232.

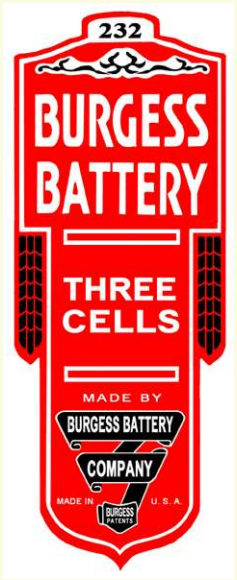
1926 Advertisement

Logo on both sides and patent claims in stripes. **>>>**

These very small advertising cuts – all different! All with fewer stripe pairs than **UNI-CELL.**

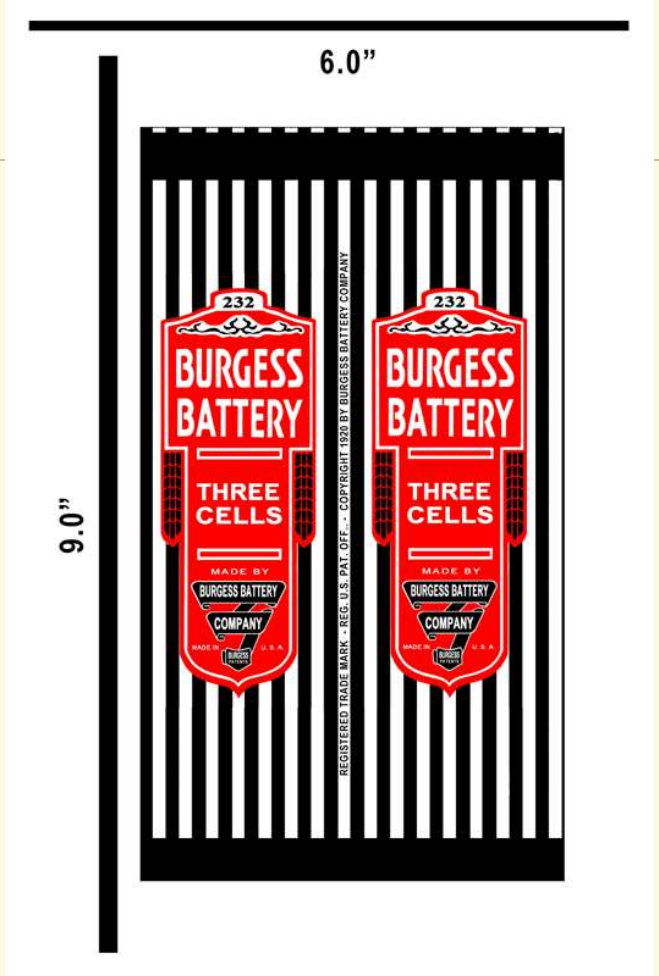
More cut and paste to create my best guess.





How wide is the shield? How many stripe pairs? What is the full patent text used in 1923/24?

I may never know for sure.



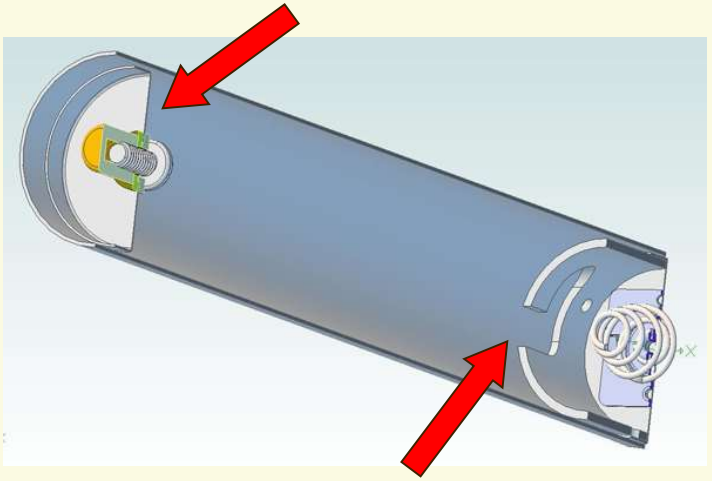
What to make it out of ?

My answer: A TV antenna mast and 1” EMT!

Big enough to hold three modern ‘C’ cells which have almost the same A/H capacity as the circa 1924 ‘D’ cell.

Much more if you use alkalines.

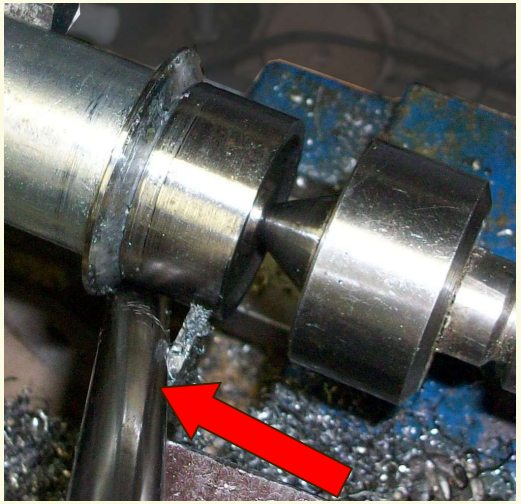
Bulkhead to support insulated Positive contact.



Bayonet lock base feature allows you to completely hide the loading method.

New skills to be learned.

Metal spinning… Just a matter of brute force…

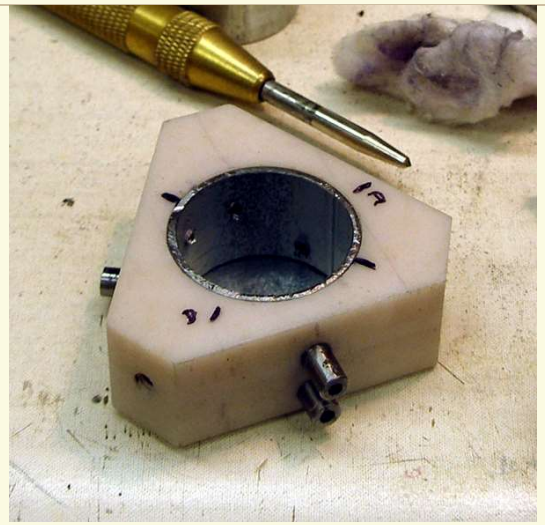


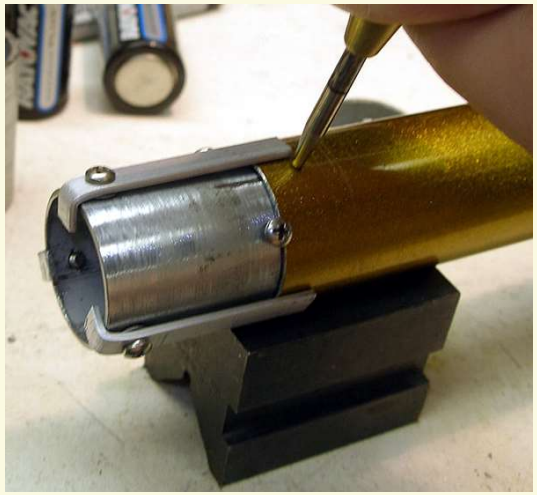
For a right angle wall, you can make it about 12 to 15 times the metal thickness.

The metal is about 0.016” thick so I make the wall about 0.22” high.

<<<< Forming tool.

Some of the other fixtures and jigs to complete the tasks.





Making the bayonet lock for the end cap would be an ideal screw machine task.

But I don't have contacts in the business.

So here are really good answers to what it looked like.

Which version batteries would you prefer?

I prefer the Eveready because I've never seen the orange color scheme before.

But then again, I've never seen the Burgess flashlight battery either!

More battery replica information ?

Just Google:
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