

# Feature



## Inexpensive, Lightweight Steampunk Gauges

**Philip Gust\***

*Real metal gauges for steampunk costumes are both expensive and heavy. A prop maker shows you how to make convincing, lightweight ones for nearly free.*

The two hallmarks of steampunk costuming are gears and gauges. Gears are useful for transmitting power from steam engines, but gauges are essential for keeping those engines from blowing up because of too much pressure.

Gauges appear on props like steam-powered rail guns (below), or tanks strapped to backpacks (above). They can also be worn on a costume as an accessory, such as on a steam-powered hat (top right). One



Backpack mounted tank.

company even sells a steampunk flask with its own gauge showing how much “fuel” is left in the flask (bottom right).

Commercially made steampunk products come with specially made gauges, but if you are building your own steampunk costume, prop, or accessory, where can you find one? You could always go to a junk yard or specialty hardware store and buy a real gauge, but there are several problems with that.



Steam-powered rail gun.



Steam-powered hat.

First, real working gauges are expensive measuring devices, and those don't come cheaply. Second, they are heavy. Gauges are usually made of brass or other metal that can resist high pressure. Even a small gauge can weigh close to a pound, and larger ones are even heavier.



Stem-powered hip flask.

Finally, working gauges come in limited sizes. If you need a gauge with a certain diameter to mount to an accessory, you are unlikely to find a wide selection to choose from. They may also be too thick for your needs, such as on the steampunk flask, which requires an unrealistically thin gauge.

If you are building a steampunk prop, costume, or accessory, you are better off to make one. It will be lighter, less expensive, and just the right size and thickness to meet your needs. As you will see in this article, building a convincing steampunk gauge is not nearly as difficult as you might think, and requires only the simplest of tools.

To make your own gauge, will need

- a plastic screw-on jar lid,
- stiff plastic sheet protector or some other stiff sheet plastic
- light cardboard, like a cereal box
- adhesive (contact cement or fast-drying spray is best)
- Flat wooden toothpick for needle
- a screw, dowel, clip, or some other way to mount the gauge
- decorative greeblies such as small wood or sheetmetal screws, snaps, stick-on dots or jewels, etc.
- Plastic paint and primer
- access to the web
- a printer

Start by determining what range of diameters and thicknesses will work for your application. Getting the range is important because you will be using that to locate a plastic screw-on jar lid that will work for your application. In most cases, you will want the gauge to be somewhat oversized to stand out and be readable from a distance, to fit in with the exaggerated steampunk esthetic. Besides, tiny gauges the size of a wrist watch or smaller don't "read" well from a distance and tend to disappear.

Once you have determined the range of sizes, determine what size of jar has such a lid. Instant coffee or tea jars, for example, tend to have caps that are between 2-1/2" and 3" (6cm-8cm) in diameter. Larger bulk food items like biscotti often come in plastic jars with lids as large as 4" (10cm) in diameter.

You will also want to find a plastic jar lid with grooves around the diameter that



Range of plastic jar lids are available, from as small around 1" (2.5cm) to 4" (10cm) and larger.



Jar lid with more groove pattern on edge. This lid is around 2-1/4" (7cm) in diameter.

make them easy to grasp. Grooves come from very fine to fairly thick and widely spaced. Find a groove pattern that appeals to you.

It is generally best to use a lid from an empty jar that you are getting ready to recycle. If you do not have a suitable jar lid, you can put out call to family, friends and neighbors to keep their eyes open. Who knows, someone you know may be getting ready to discard just the lid you need at this moment.

If you cannot locate a suitable jar lid, then it is time for a trip to the grocery store to find a product that has exactly the right lid. It will cost money in that case, but at least you will have exactly what you need. Besides, if it is a product you would normally consume, you will have the bonus of enjoying what is in the jar as well.



Use plastic primer to ensure better paint adhesion.

Now that you have the right lid, see if it has a paper insert. If so, carefully lift out, being sure to keep it intact. You may need to use the tip of a pointed knife for this. Now, measure the diameter of this insert. You will need this measurement later. If the insert is sturdy cardboard, you may be able to use it, so be sure to save it just in case.

You will eventually want to paint the lid the color you need. Plastic generally needs a primer coat for the paint to stick. Buy a can of dark, flat spray primer at your hardware or hobby store. For some kinds of plastic, wiping it down first with alcohol might be a good idea to remove any residual grease or coating. Go ahead and give both the inside and outside a couple of coats and let it dry while we do our next step.



Search results for "pressure gauge face (above) and "steam gauge" (below).

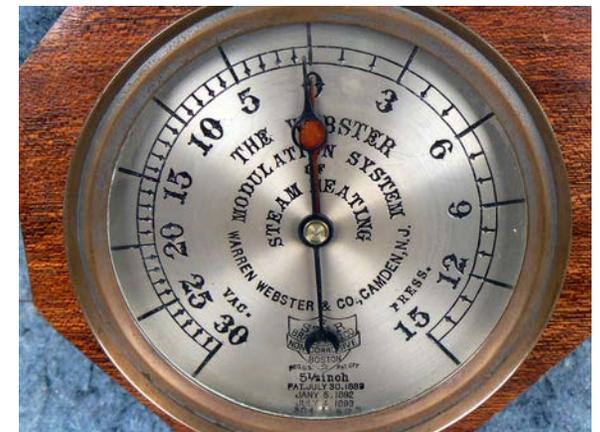


Now, start your browser and use your favorite search tool and search for “pressure gauge face” or “steam gauge.” If your search tool has it, switch to the “images” view. You will see literally hundreds of images of all types of gauges and faces. Some of them look more antique than others. You should also carefully study how steam gauges look, so you will have some ideas when finishing yours.

Once you have found a gauge face that you like, open it in a presentation tool like Microsoft PowerPoint, MicsOS Keynote, or OpenOffice Drawing. These tools will let you scale the image to the exact dimension of the lid insert that you measured earlier.



Examples of interesting steam gauge faces from the late 1800s with needles. Metal color faces look good.





Gauge face extracted from image and scaled to jar lid, ready to print.

Try a test print in “preview” mode to avoid wasting toner. Cut it out and try inserting it into your lid. If it is too large or too small, go back and adjust the image size slightly and try again until you have just the right size. Print the final version in “high quality” mode.

Next, glue this image to a thin piece of light cardboard, such as from a cereal box, or to poster board. Be careful of using white glue because it could soften the paper. I recommend using either contact cement or a spray adhesive. When it is dry, try it to the same diameter, and try it again with your lid.

If the image has a indicator needle, you can just use that. If it does not have a needle or you want something with a little bit of dimension, you can paint a flat wooden toothpick and glue it to the gauge when dry. A simple trick is to use a “Sharpie” to color the toothpick rather than paint if you are in a

hurry. (I had to build one of these in under 30 minutes once, including drying time.) You can also make an extra print of a gauge that has a needle, glue it to light cardboard, and use a sharp craft knife to cut the needle out and glue it to the gauge image to give the needle extra dimension.

Now cut out a “lens” to put over the gauge of some thin but rigid flat plastic. A clear plastic loose leaf notebook sheet protector works well, but there are many other things you could use. For example, some product packaging have clear plastic “blisters” with a large enough flat area you can use.

You can pre-assemble your gauge face, and cover assembly with small “offsets” around the rim of the face to hold the plastic lens cap away from the face, or just carefully insert the lens cap after you insert



Use sheet protectors as gauge lens if plastic is stiff.



Metallic spray paints (above) and hammered metal spray paints (below) are options as a base coat.

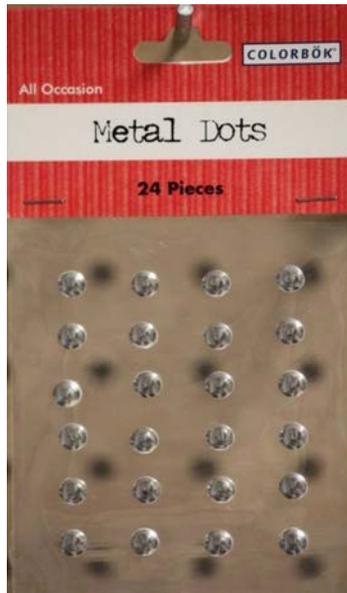


the face into the lid. If your lid is too deep, you can always cut a piece of corrugated cardboard the same diameter and put that in the lid before inserting the face and lens.

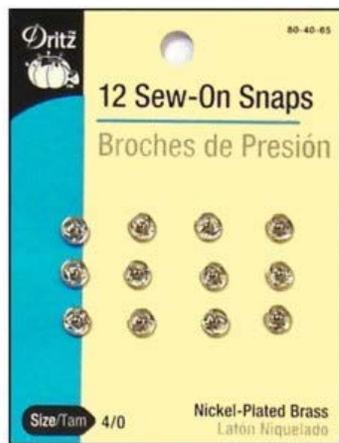
Before inserting the face and lens into the lid, you will want to paint the lid its final color. You can use whatever base color suits your application. A matte black is always a safe choice. You can also use various metallic paints if you want to simulate a metal like brass or iron. There are even paints that give the surface a hand-beaten look. Be sure to paint inside the rim of the

lid far enough down that the original plastic color is covered by the gauge face and lens material.

You will also want to consider how you will mount the gauge. If it will be sticking out of a tank, for instance, drill a hole in the



Use metal dots or painted stick-on jewels as rivets.



Using acrylic paint to add tarnish, rust, or patina.

rim of the lid and put a bolt through the hole with the head inside the lid. Add a nut to the outside and tighten to hold it securely.

Now, go ahead and insert your gauge into the lid. If you cut out a spacer, insert that first, then the gauge face, then the lens. If you measured correctly, you should not require any glue: it should be a good, snug fit. If it is too tight, *carefully* trim a little around the edges until you get a snug fit. There is no real pressure on the gauge, so everything should stay in place.

Finally, it's time to decorate the gauge. You might decide to add "greeblies," which are little bits of things to give it a more authentic look. For example, you could add a few tiny screws around the edge of the gauge or one in the back. You could also add small snaps, self-stick-on metal dots or jewels painted to simulate rivet heads (left). Use your imagination!

Finally you can make the gauge look old and worn by using different colors of

acrylic paint to add bits of tarnishing, rust or the green patina of oxidized copper (left). Again, use your imagination. If you need inspiration, you can always look at pictures of tarnished metal on the web to see how it should look.

After everything is finished and thoroughly dry, you're ready to attach your gauge to your prop, costume, or accessory.

Once you have made your first gauge, you can now branch out and make other kinds of gauges a too. Play with different sizes, face designs, needles, and finishes. You're only limited by your imagination!

*Philip Gust enjoys sci-fi and fantasy costuming, and has particular interests in props, special effects, and prosthetic makeup. He also costumes in historical periods, including Regency, Victorian, and early 20th C.*



Finished steampunk gauge, ready to mount.