How a Gauge works and it's use

A Frenchman, Bourdon, invented the first gauge in 1849. A short length of tubing is flattened to an oval and bent to a C shape curve. One end is anchored to a base that has an opening to admit pressure. The top end is closed and has a link to the gear quadrant (or sector). Old gauges refer to the bourdon tube as a spring because it straightens with pressure and springs back when there is less pressure. In operation the link pulls the quadrant which rotates the pinion gear moving the hand. The pinion has a hair spring that keeps light tension on the works to eliminate backlash. Most old gauges have an auxiliary spring to help keep the mechanism steady when moving over rough terrain. Some later units omitted this spring.

The above illustration is a 4 ½" Single Spring unit with auxiliary spring. The wire fork over the hair the hair spring keeps it away from the sector gear to prevent tangling.

Many single bourdon units curl down at the top end. Water can stay there, which is certain to freeze and damage the gauge. Double spring gauges will drain better and do not need the auxiliary spring. They are also much more accurate (costly). Lower pressure gauges, less then 400#, are usually soldered. Higher pressure units are silver soldered, brazed, or welded. Some older Crosby unit tubes were threaded to eliminate solder joints.

The tubes can be made of many types of metal, copper, brass, stainless steel, or iron for ammonia service. A few older gauges (Belfield) used a metal diaphragm instead of tubes. Newer ones now use diaphragms for very low pressures.

Gauges are sized by the diameter of the number (or chapter) ring on the face, **not** case or bezel size!

The above illustration is a 4 1/2" Double Spring gauge.

When mounting a gauge on a steam engine always use a siphon to protect the unit from high temperatures. First fill it with water, then attach the gauge. Remove both items if frost is forecasted! Most gauges should only be pressurized to one half of the dial reading. Example: a dial printed 0 – 300 lbs will be used to indicate 150 lbs, 225 lbs **MAX**.

Antique Gauge pricing (My estimates)

(Some auction prices may vary a LOT!)

1) Antique 4 ½” gauge, plain	$100.00
2) 300 pound unit, add	$100.00
3) Double spring, add	$100.00
4) Name (IE: Case), add	$100.00
5) Fancy brass bezel, add	$100.00
6) Brass housing, add	$100.00
7) Larger, each size add	$100.00
8) Rebuilt, calibrated, add	$100.00
9) Threaded bezel, add	$100.00
10) Test Gauge, add	$100.00
11) Rarity. You name the price!	