A TECHNIQUE FOR REMOVING RUST FROM IRON OR STEEL

by J. Scott Altenbach

A relatively simple technique for removal of rust or virtually any surface accumulation from iron or steel objects involves an electrolytic process in an aqueous ionic solution. Materials required are a nonmetal container nearly full of water, table salt (NaCl), an iron or non-alloy steel electrode suspended in the water, a DC power supply with clips on the output and attention to detail. A low charge rate battery charger is a suitable DC supply. ***If you have a high-rate charger, pay particular attention to item #5 below! Do this only in a well ventilated or outdoor location! Before attempting this, you need to have a thorough understanding of general electrical principles and electrical safety. As with abandoned mine entry, death is a possibility for the uneducated and unwary practitioner!***

One side of a rusted lid of a California Cap Company tin cleaned by the electrolytic process described, other side untreated.

1). The iron or steel item to be cleaned is suspended in the water bath by the clip on the CATHODE (-). Be careful not to let the copper clip touch the water.

2). The suspended iron or steel electrode is connected to the ANODE (+). Again, do not let the copper clip touch the water.

3). Be sure that good contact exists between the clips and the immersed iron. Some light scraping or light steel wool rubbing may be helpful.

4). Turn on the power supply and note that no current will flow. Much to the surprise of many, relatively pure water is a very poor conductor of electric current.

5). ***Very slowly*** begin adding some salt to the water with constant stirring. You will notice that current will begin to flow as indicated by the ammeter on the power supply and bubbles will begin to form on the immersed iron. Add salt slowly, ***with continuous stirring,*** until you have no more than about 5 amps of current. ***IMPORTANT! Do not let the current get very high, generation of CHLORINE GAS will result!*** Don't dump in a mass of salt all at once. It will gradually dissolve and with a constant voltage DC power supply, you will gradually establish far too much current. If the current gets too high, shut off the power supply and go back to step 1. ***IMPORTANT! Do not attempt to adjust the clips on the immersed objects or remove them without shutting of the power supply. A spark will ignite the oxygen and hydrogen gas that is generated at the electrodes!***

6). Since the object cannot be fully immersed because of the need to keep the clips out of the solution, rotate the object periodically. ***TURN OFF THE POWER FIRST!***

7). As the process continues, you will notice that reddish rust or surface accumulation becomes loose and black. Periodic rubbing with a coarse cloth will remove this material easily and you will eventually have an iron object with only a fine, black coating. This can be removed with one of the "rust remover" products like Naval Jelly. ***Be sure to read the instructions for the use of this product.*** Final washing in water and gentle buffing with coarse cloth will reveal a virtually rust and corrosion free object (Fig. 1). This process will not put back iron lost to oxidation and you may wind up with pin (or larger) holes which had been filled with rust!

8). As you will see, the process is highly destructive to the ANODE iron electrode and it will require frequent replacement. ***The same applies to the object you wish to clean if you reverse the electrodes. Experiment on a WORTHLESS, rusty, old can first!***

9). Remember Andy Martin's admonition. Don't do what you can't undo! Remember my admonition. Don't try this on nonferrous objects! This can be disastrous for stupid and uninformed people! ⚒

A Little Sound Advice

November, 1917 THE ANODE 7

SHINE 'EM UP BOYS

By John Curran, West Gray Rock Mine

A notable thing among men working in the mines is the unclean and careless way in which they keep their carbide lamps. The result is that an insufficient light is shown with which to work properly, and this sometimes causes serious accidents. Care of lamps is a matter which should have strict attention as good light is one of the principal safety-first considerations.

It is only a simple matter to carry a small piece of cloth or cotton in the overalls, and in spare time give the lamp the once-over; the reward will be a much brighter and better light. Another good plan is to is to unscrew the lamp, and leave it apart in the locker in going off shift. This gives the pad on the inside an opportunity to dry out. Every man using a lamp should have a needle or wire of his own to remove dirt from the burner, and thus avoid the trouble and annoyance caused by continually borrowing from others.

One for the Birds

This birdhouse, constructed from a 5,000 count DuPont blasting cap box, was recently found in a dump at the bottom of a waste pile below a mine in snowy Colorado. Though it is far from a museum piece, and probably fits into the category of relic when compared to, say, a candle box in the same shape, I still think it is a pretty neat item from the past.

It brings forth a picture of a grizzled old fellow with a penchant for the natural world around him, and a desire to share his lonely life with birds brought in by his somewhat unorthodox use of an old explosives box. Either that, or he found a unique way to bring in finches to add to his usual table fare of bacon and beans.

Your choice!