



Bulletin # 7

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☞ Riding ☞ Collecting ☞ Restoring ☞ Research ☞ History ☞

## Nickel, Bright, and Gunblue Finishes

Very early high wheels had what was known as a “bright” finish, at least in part. This was simply a good polishing on the bare steel, and was naturally very subject to rust and corrosion. There were “half-bright” or “all-bright” and in the case of the former, were combined with enamel on some of the parts.

### NICKEL VS. OTHER FINISHES

Because of the bad rust problems with bright finishes, nickel plating was introduced a few years later. There were many combinations of nickel plate and enamel, and these ranged from just a few nickeled parts (such as handlebars and cranks) to a more completely plated machine, i.e. “half-nickel” which included handlebars, cranks, seat springs, pedals, hubs, and spokes, to the ultimate “full-nickel” which was completely nickel plated with no enamel at all or possibly only the rims enameled. The extent of the nickel plate varied with make and year and the only safeguard of accuracy in your restoration is to study a catalog for your machine. If you need help, check with the club Historian, the Librarian, or other members.

Nickel plating when well-maintained has an excellent appearance. However, it too, is subject to corrosion, and in order to maintain its brightness, a good hard wax job should be used during long periods of storage. This should be redone each time the bike is used.

Because of this extra maintenance, some collectors prefer to use chrome plating. This is much more durable (the coating itself is extremely hard and not as susceptible to chips or scratches), and the corrosion problem is practically eliminated.

Purists, however, prefer to be correct and use the nickel and in many respects it provides a much more pleasing overall appearance. Chromium plating is cold and bluish in tone, while nickel provides a much warmer tone that is more in keeping with the appearance that most collectors desire.

Parts were sometimes gunblued. For instance, the hubs on the 1886 Star and the axles and bearing cones of

many Gay Nineties safeties were gunblued. This is a godsend because you can send only the hub shells to the plater and avoid plating of the threads and polishing of the middle of the axle. Get the gunblue paste at a gun shop. No skill is needed and it is fun to see the parts turn blue.

### PREPARING - PLATING - POLISHING

A good nickel plating job on an old metal part is not easy, and there are a number of important points that should be understood if you intend to have some nickeling done.

In general, there are two major parts to the plating operation that demand a great deal of attention. These are, first, the preparation, and finally the plating itself. In fact, the plating operation is relatively a simple one with today’s technology, but the preparation can make or break the job. As a general rule, these are usually done in different establishments. Very few platers have adequate facilities for good polishing and buffing.

As an important preliminary, however, check to see if there is any plating on the parts. This must be completely removed before replating takes place, as the new plate simply will not adhere to the old plate. This may be done by grinding and polishing, but it is generally more satisfactory to take the parts first to the plater and have him chemically or electrically strip off the old plate. This works fast and does a thorough job even in hard-to-reach places, but has one serious disadvantage. Many of the old parts were composites which were put together with copper-brazing alloys. For example, many front forks were made of two hollow sections which were attached at the top with pins and then filled in with braze. The stripping may

remove this braze, particularly if left in too long and in some cases these areas may have to be refilled with new braze material. This must be done hot, of course, but the polishing comes afterwards so it is not too big a problem if you have access to a brazing facility.

Then comes the polishing. This should be done after a good discussion with the polisher to make sure he knows what you are after. The following points are worth mentioning:

1. Any mark that is left after polishing will show after plating—in fact they will appear to be exaggerated. This even means fine scratches. When the part receives its final lapping, it should look as good as though it were plated.
2. Brazed areas polish and lap more easily than steel, and if overdone, can be eroded away and leave a low spot at these regions.
3. If there are pits or flaws that are particularly deep, and if the section being polished is hollow, be careful not to go so far as to weaken the part by making it too thin.

Remember—a good polishing house has good equipment; heavy duty buffers and grinders with proper wheels, proper preparation techniques, and correct compounds for all stages of the operation. In terms of cost this should be the most expensive part of the entire job.

Now back to the plater—if stripping was required initially, he could have done it for you. Here is a very brief outline of what happens during the plating operation for information purposes. The part is:

1. Cleaned with caustic soap—this removes dirt, grease, oil, etc.
2. Cleaned in a polarized bath. This is comparable to step 1, but causes the foreign matter to migrate away from the part.
3. Rinsed in water.
4. Neutralized in 50% hydrochloric acid solution and again water rinsed.

5. Undercoated with copper. A copper strike is applied to improve the adherence of the nickel. This is done in an alkaline electrolyte bath in a few seconds, and the coating is only .0001" to .0002" thick.
6. Water rinsed.
7. Bright nickel plated. This is done electrolytically and requires a total immersion time of about 15 minutes. These baths contain a number of additives, such as converters, brighteners, anti-pitting agents, anti-foaming agents, etc. The final total plate (copper and nickel) is about .0005" to .0008".
8. Final-rinsed first in a slightly caustic bath to neutralize the acid plating solution, then in a pure water rinse.

In addition to the need for a good hard wax polish, there is an extra precaution that may save some later grief. Some of the parts are hollow, and these generally have vent holes that permit the various solutions to penetrate. If these are able to seep out later on, they can corrode the bright nickel permanently in the regions around the holes. A possible preventative is to force some water (use a squeeze-type device such as a syringe) into the hole for another water rinse, then drain carefully and finally squeeze in some water soluble oil such as WD-40. This will also prevent rusting and corrosion from the interior, which could eventually weaken thin sections.

#### FINDING A PLATER

Check your classified phone directory for shops that do antique auto parts. A principal part of the work is grinding down your rust-pitted parts to prepare them for plating. Some shops do only mass production plating of new parts and do not want those troublesome little jobs. They may also lack grinding skills and equipment. Have them quote a price when you show the parts. Ask for a date of completion also. Allow a good six months before you want the parts, but try to get them sooner to minimize the risk of loss.

### SOME IMPORTANT TIPS

#### REMOVING THE PARTS

Be extremely careful not to break any parts in removing them. Apply penetrating oil several days in advance. Don't force anything; if some part proves recalcitrant, put on more penetrating oil and wait another day. Closed or box wrenches should be used wherever possible. Open adjustable wrenches can slip, and will quickly destroy the corners of old nuts and bolts. Be sure not to hold the wrench at the end of the handle, but close in so you do not

apply too much torque. A blow torch helps to loosen badly rusted nuts. Maintain the same precautions when reassembling after the plating. Hold the wrench close to the jaws and only snug the nuts so that you do not strip the old threads. Many old machines have odd thread sizes and counts and replacing them may be difficult indeed. It is generally not worth grinding and filing your own parts if you lack the proper equipment and skill. If spokes are sound it may be wiser not to disturb them. It is just too big

an effort to re-spoke a wheel with precision. It is also wise sometimes not to disturb tight cranks and pins, but the plating of handlebars and seat springs is a must.

#### IDENTIFYING THE PARTS

Make a good listing of the parts you take in for these operations. Remember that they are going through many operations, and will probably be handled by many people. A good method is to spread them out flat and take a Polaroid photo of the entire group.

1. Take parts of only one bike at a time to avoid mixups.
2. Put a punch mark on the inside of the left crank so you get it back on the same side.
3. As you separate parts, write careful notes and sketches of assemblies: what size nuts go on the front wheel and what size on the back, what size washers, etc. Count the washers, nuts, and other parts and list them.

You may consider *not* plating some of the very small parts, such as small nuts and bolts, etc. These can be polished at home, given a good coat of lacquer, and when assembled will not detract from the appearance of the larger nicked sections.

#### INSTRUCTIONS TO THE PLATER

When you give the plater the parts, also give him a copy of the list and photo and such instructions as follow:

##### “ANTIQUE BICYCLE PARTS TO BE *NICKEL PLATED*”

- “Do not polish centers of axles.”
- “Plate THIN on threads” or “No plating on threads.” (Threads can be plugged or taped as mentioned below.)
- “Do NOT grind where crank must fit tight on crank axle.”

Although the plating is generally very thin, it can be heavy enough to cause problems with threaded parts, and there may be difficulty in reassembly after the plating operation. It is a good idea to have the plater plug these or do it yourself. Rubber plugs work for inside threads, and plastic tape for outside threads.

The foregoing is a brief summary. The real expert, of course, is the plater himself. If he is known for quality work, you should emphasize the value of your parts, and the need for a good job. But remember—a good plater and a good polisher are two different people!