

METALLURGY

Money Gets War Dress

Coinage has been affected by the war-induced shortage of metals so that now the Mint is issuing a zinc-coated penny and a "nickel-less" nickel.

By WATSON DAVIS

► COINAGE in the United States and neighboring countries has been greatly affected by war-induced scarcity of strategic metals. Some of the familiar coins are no longer being minted. Substitutes, made of more available metals, in many cases closely resemble the coin which they replace. Others bear no likeness to their predecessors and their design may even incorporate a patriotic motive.

The newest U. S. coin is the new zinc-clad steel penny, which is not yet in wide circulation. It was issued in order to reduce the amount of critical materials, urgently needed for the war effort, that will go into coins for the daily use of the American public.

The production of this new coin was accomplished after considerable technical experimentation and research on the part of experts of the U. S. Mint at Philadelphia and other government departments.

Consideration was first given to metals other than steel and even non-metallic materials. Plastics were considered but not used for various reasons, among which is the fact that they would not work in the familiar penny slot machines.

The new one-cent piece was made of metal other than copper in order that copper might be released for the war effort. In 1942 the coinage of one-cent pieces required 4,600 tons of copper. The new coin bears the familiar Lincoln design of the most recent penny that it supersedes, at least for the duration of the war.

Slightly Lighter

It is the same size as the copper cent but is slightly lighter in weight, weighing 41.5 grains against 48 grains for the copper coin. Incidentally, both pennies have a diameter of three-fourths of an inch.

None of the old copper pennies were minted after January 1, 1943, and there was a period of over a month during

which no pennies were produced by the United States Mint.

The coating of zinc upon the steel of the new pennies is very thin, being only .00025 inches thick. Since the coins are stamped out of steel strips that have been coated with zinc, the edges of the coins are not zinc-coated. Nevertheless the fact that the obverse and reverse sides of the coin are coated interestingly protects and prevents rust on the edges of the penny. The reason is that a galvanic action is set up.

This is the same phenomenon that occurs in barbed wire where edges that have been cut do not rust even though they are not coated. The steel strips are purchased by the Mint from commercial companies and the manufacture of the coin is performed at the Mint.

Production of a new coin from a metal formerly not used in the United States coinage presented several new problems to the government metallurgists in the Mint and other government departments who were concerned with the production.

Stuck to Dies

One problem that arose was that the coin that had just been stamped out of strips stuck to the dies that were doing the stamping. An expert from the National Bureau of Standards was summoned to Philadelphia to determine the cause and his inquiries showed that a magnetic chuck had been used to hold the die during its machining. As a result the die had become magnetized and it was for that reason that the new steel pennies were sticking to it. It was a matter of only a few minutes to demagnetize the die and thereafter that trouble was avoided.

When newly struck, the steel penny has a silvery appearance not unlike that of a dime, but the new coin darkens quickly when it has been in circulation for a while.

While this is the first time that iron has been used in American coins, cast iron coins were issued in China nearly two thousand years ago. The same

reason as now, caused the use of iron in these early coins.

The new steel penny not only saves copper but it saves some tin also since the composition of the old copper penny was 95% copper and 5% zinc and tin.

War conditions brought about an unprecedented demand for pennies. Sale taxes caused a larger use of pennies, as did rising prices which caused the pricing of many things at odd figures.

For the past two years the Mint has been working 24 hours a day, including week-ends, to supply coins essential to the economic life of the nation. The output for 1942 amounted to one and a half billion pennies, which was a tenth of the Mint's total penny production of the last 150 years.

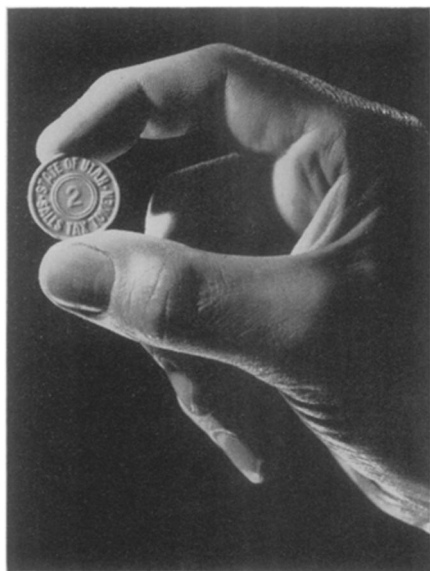
Nickel-less Nickel

You probably receive occasionally in change another new United States coin which has been issued due to the shortage of metals caused by the war. This is the new five-cent piece which may be called a "nickel-less nickel."

Like the one-cent piece, the design is the same as the older coin that it replaces, but since the color of the new five-cent piece is very similar to the color of the older one, a distinguishing mark has been placed upon it by the Mint. A mint mark has been placed directly over the dome of Monticello: "P" for Philadelphia, when the coin was made in that city, "S" for San Francisco, and "D" for Denver. This is the first time that the mark of the parent mint in Philadelphia has ever appeared on a coin.

The new five-cent piece contains 56% copper, 35% silver and 9% manganese. You will notice that silver is used in making this nickel. Although selling at a higher price than copper or nickel, nevertheless it is not actually as useful for war purposes and therefore is available for use in coin. The old coin contained 75% copper and 25% nickel.

The manufacture of the new five-cent piece was in some respects a more difficult metallurgical problem than the manufacture of the new one-cent coin. Due to the fact that five-cent pieces are used in many varieties of coin machines, it was necessary to produce a coin which had weight, elastic properties,



PLASTIC—Sales tax tokens of cellulose acetate are being used in some states, thus conserving many tons of metal for warfare. These plastic tokens are molded complete in one operation, requiring no subsequent stamping or polishing.

conductivity and magnetic properties the same as the old coin.

All of these properties are utilized in vending machines and other coin machines, such as subway turnstiles, to eliminate slugs and fraudulent coins. Manganese was placed in the coin in order to give it the proper electrical characteristics.

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You might care to watch the change closely for the new penny or Jefferson nickel with the mint mark. When you receive them in change, inspect them but keep them in circulation so that as little critical materials as possible are used for coinage.

Due to the scarcity of metals, particularly copper, zinc, tin, aluminum and others that have been used in coins, the use of plastics for coins has been suggested. While coins of federal issue have been made only of metal, nevertheless one of the most widely used plastics, cellulose acetate, is being used as the material for sales tax tokens.

Different colors are used to distinguish different mill values where more than one denomination of token is used in a state, as well as to differentiate between adjacent or closely associated states collecting sales taxes.

The tokens have a lustrous dirt-resistant surface and a range of colors.

Tests show that they can withstand the abrasive wear of constant handling.

As an aid to the war effort, Mexico has issued a new five-centavos piece, replacing its nickel coin with a copper one. The copper coin is the new five-centavos (cinco centavos) piece which has very recently begun to circulate in Mexico. Composition of this coin is 95% copper, 4% zinc and 1% tin. It replaces a coin of somewhat smaller size which contained 20% nickel and 80% copper. In Mexico the authority that issues coins and currency is the Banco de Mexico.

The new cinco centavos pieces are known in Mexico as "Josefitas," due to the fact that they bear upon their face the image of Maria Josefa Ortiz de Dominguez, a heroine of the early nineteenth century whose name is imperishably linked with the independence of Mexico.

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PUBLIC HEALTH

Outbreak of Glue Itch

Lost time in war plants has been caused by unusual number of cases of skin disease. Methods for treatment and prevention are given by the Public Health Service.

► AN OUTBREAK of glue itch among workers in the plywood and laminating industries is causing much lost time in war plants making planes, gliders, propellers and other airplane accessories, Dr. Louis Schwartz, Dr. Samuel Peck and Dr. John E. Dunn, of the U. S. Public Health Service report.

Skin trouble from glues has been often reported in the past but there has been no such outbreak as that which is now occurring in the plywood and laminating industries," they state in *Public Health Reports*.

Glue itch, technically called glue dermatitis, affected 600 out of 800 workers in one factory during its first six months of operation. These workers lost about 1,500 work days, not counting the time lost by those who stayed on the job while receiving treatment in the plant first aid station. In another factory there was a monthly labor turn-over, because of the skin trouble, of more than 40 among a total of 100 employees. In a third of the seven plants investigated, the fingers of most of the workers were inflamed and cracked by the glue.

Irritating substances in the glues cause

the trouble. Urea-formaldehyde and phenol-formaldehyde resin adhesives caused most of the trouble in the plants inspected, but glues with such harmless-sounding names as gelatin glue or casein glue may have irritating chemicals added.

For treatment, the federal health service doctors advise that only soothing wet dressings, such as boric acid solution or Burrow's solution, should be used during the acute stages when there is swelling, blistering and oozing of the skin. In the later stages when the eruption begins to dry and crust, mild fatty-base ointments should be used.

Prevention depends on keeping the glue off the skin and washing it off promptly when it does get on. The Public Health Service advises installation of suitable exhausts to remove fumes and dust; provision of clean overalls daily; protective gloves, aprons and sleeves; installation of facilities for hand washing with soap and running water; washing or changing of brushes and sponges every two hours; and compulsory showers, on company time, after work.

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