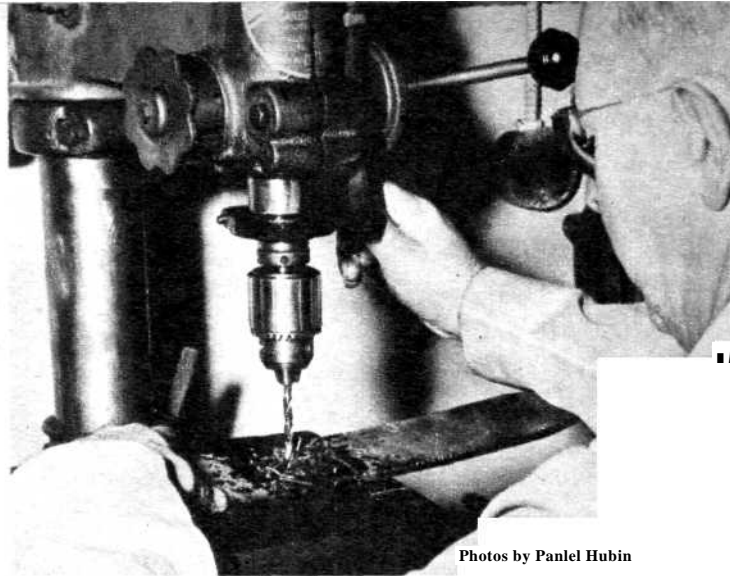


Right: Boring tough automobile spring leaf with ordinary carbon drill after it has been case-hardened in a home workshop. Above: Samples of what case-hardened objects can do.



Photos by Panel Hubin

HARDENING STEEL in the home workshop

By Albert A. Brandt

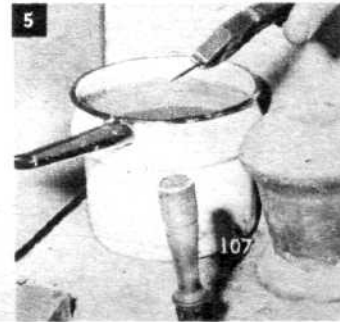
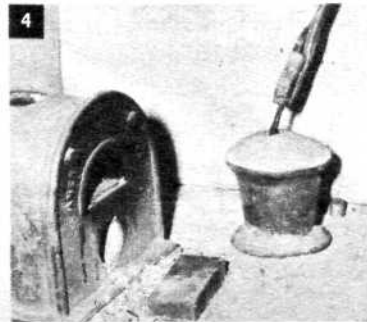
HOW many times have you wished that you could put a tough edge on an ordinary nail and drive it through a piece of—say, 1/8-in. steel plate?

Now, using a non-poisonous alloy powder developed by Samuel D. Necamp, known as Hi-Speed-It you can do just that. The powder fuses into the metal and increases its surface hardness in a matter of seconds.

No special equipment of any kind other than a gas ring or Bunsen burner is required.

To harden iron and low-carbon steel with the Necamp powder, you first heat the object to a cherry-red color (between 1,400 and 1,700°F). To ensure even heating, it should be turned or rotated while heating. [Continued on page 158]

1. First step in case-hardening; heat object to cherry red.
2. Object is then dipped into powder and stirred to insure even coating.
3. After reheating the object is quickly quenched in brine or clean cold water.
4. For greater depth of hardness the process is repeated again.
5. A Bunsen burner is being used to heat a dentist's burr for hardening.



Hardening Steel

[Continued from page 107]

The object is next dipped into the powder and stirred about until a thick coating adheres. From 15 to 30 seconds is allowed for the powder to fuse into the metal. The object is then reheated to a cherry red color and quenched quickly in brine or clean cold water.

A second fusing and dipping into the alloy powder before quenching will give greater depth of hardness. The same procedure may be followed to case-harden cold-rolled or machine steel.

After the powder is well fused into the metal, when case-hardening high-carbon steel, the object should immediately be brushed thoroughly with a wire brush or emery stick to remove excess coating. It should then be reheated to cherry red and quenched. With high-speed steel, the object is heated to a somewhat higher temperature—between 1,800 and 2,200°F (white-hot)—and is quenched in oil.

Fantastic as it may seem, an ordinary nail can be hardened by this process so that it can be driven through cold steel plate, while chisels can be made out of ordinary bolts or cold-rolled rods. It is possible to harden a carbon-steel tool so that it will do the work of a high-speed tool and give a carbon drill sufficient hardness so that it will shear through automobile spring leaf, blue spring steel and other tough alloy metals. •