

# UNITED STATES PATENT OFFICE.

JAMES H. VAN DORN, OF CLEVELAND, OHIO.

## CASE-HARDENED BAR OR PLATE.

SPECIFICATION forming part of Letters Patent No. 440,978, dated November 18, 1890.

Application filed November 26, 1889. Serial No. 331,688. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES H. VAN DORN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improved Case-Hardened Metal Bar or Plate as an Article of Manufacture; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to an improved case-hardened metal bar or plate, the same being adapted more especially for prison work, such bar being compressed by rolling or drawing cold, or by other means, whereby a hard dense shell is formed as a preparatory step for the case-hardening. Soft steel or iron bars are preferable for prison work on account of their tensile strength, and to prevent such bars from being readily sawed or cut they are usually case-hardened. If the case-hardening is deep, it renders the bar brittle and easily broken, and consequently worthless for such purpose. On the other hand, if the case-hardening is of little depth, such case-hardened shell is easily broken by reason of its having insufficient backing. It is not therefore a difficult matter to break the thin case-hardened shell of a soft metal bar by means of a sharp blow delivered with a hammer or other blunt tool, whereby such shell is driven into the soft metal beneath. Under such conditions by means of a few well-directed blows and by exercising

a little of the patience and perseverance for which prisoners under such circumstances are noted, in picking out the broken fragments of the case-hardened shell the soft metal of the bar may be exposed, after which the bar can be sawed or cut without much difficulty.

In carrying out my invention I select tough strong bars, usually of soft steel or iron and a trifle larger in size than is required for the finished bar. These bars I compress, usually by means of cold-rolling or cold-drawing, to form a hard dense shell, after which the bars are case-hardened in the usual manner. The compression of the metal into such hard shell does not reduce the strength of the bar, and the shell so formed serves two purposes—first, it prevents the case-hardening from penetrating too far into the metal, and, second, this compressed shell constitutes such a firm backing for the case-hardening that it is difficult, if not impossible, with any means that a prisoner is likely to have at hand to indent such bar or break the case-hardened shell.

What I claim is—

An improved bar or plate compressed by cold rolling or drawing and subsequently case-hardened.

In testimony whereof I sign this specification, in the presence of two witnesses, this 5th day of November, 1889.

JAMES H. VAN DORN.

Witnesses:

C. H. DORER,  
ALBERT E. LYNCH.