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ALLOY FOR HIGH-SPEED STEEL

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This invention relates to the metallurgical art, particularly to alloys, and has for its object the provision or formation of an alloy for high speed steel which will require no tempering but which, after being cast and ground, will be ready for use without further treatment.

In carrying out my invention I make an alloy which is high in tungsten and nickel or cobalt content and in which a wide variation of the proportion of these elements with respect to the iron base is permissible.

More specifically I form my alloy of essentially the following ingredients varying in percentage as indicated.

Molybdenum or tungsten	13	to 40	%
Chromium	5	to 20	%
Iron	14	to 75	%
Vanadium	.5	to 3	%
Silicon	.3	to 2	%
Cobalt or nickel	4	to 20	%
Manganese	.5	to 4	%
Carbon	.85	to 3.5	%

together with the ordinary scavengers and deoxidizers such as aluminum, uranium, magnesium, etc.

In actual practice it will be noted that the well known hammered or rolled high speed steels known commercially as Rex AA, Onondaga, Blue Chip, and the like, can be utilized in the form of scrap for their tungsten, vanadium, chromium, iron and silicon values.

I have found that a high speed steel having the above mentioned constituents may be used, after casting and grinding, for ordinary machinery operations, without any necessity of tempering, though in some instances and for certain classes of work it may be found advisable to draw the temper back slightly.

Having thus described my invention, I claim:

1. An alloy for high speed steels containing tungsten or molybdenum of 13 to 40 per cent, chromium 5 to 20 per cent, iron 14 to 75 per cent, vanadium $\frac{5}{10}$ to 3 per cent, cobalt 4 to 20 per cent, and carbon .85 to 3½ per cent.

2. A high speed steel consisting of an alloy containing tungsten or molybdenum 13 to 40 per cent, chromium 5 to 20 per cent, iron 14 to 75 per cent, vanadium $\frac{5}{10}$ to 3 per cent, silicon $\frac{3}{10}$ to 2 per cent, nickel 4 to 20 per cent, manganese $\frac{5}{10}$ to 4 per cent, and carbon .85 to 3.5 per cent.

In testimony whereof I hereto affix my signature.

MONROE S. CLAWSON.