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# Interchangeable Parts

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# Interchangeable Parts

**Die Idee der Massenfertigung von exakt gleichen und damit austauschbaren Teilen ist gerade einmal 100 Jahre alt. Den Anfang machte, wie so oft, das Militär.**

Manufacturing with machine-made, interchangeable parts isn't the same as the modern assembly line. Interchangeability had to be well developed before we could begin mass-producing goods. The idea of interchangeability goes back to Gutenberg's invention of precision type. Clock-makers had started making certain parts interchangeable in the 18th century. And Americans like to credit Eli Whitney with inventing the idea in 1803 to make *muskets*.

But, for the first whole product whose parts could be interchanged, historian Ken Alder takes us to Paris in 1790. *Gunsmith* Honoré Blanc had made a thousand muskets and put all their parts in separate *bins*. He called together a group of academics, politicians, and military men. Then he *assembled* muskets from parts drawn *at random* from the bins. By then, Jefferson had already visited Blanc's workshop and written back to America about the method.

Jefferson was president when Eli Whitney duplicated Blanc's demonstration 18 years later. No one realized it then, but Whitney was *faking* it. He'd carefully *hand-crafted* each part so they'd fit together. Whitney sold the government a huge contract for four thousand muskets. He took eight years to *deliver* them and then the parts weren't interchangeable after all.

But other Americans went on to make the method work. Before the Civil War, we had *rifles* with parts that could be *swapped*. After the war, we began making complex *merchandise* like *sewing machines* and *typewriters* with interchangeable parts.

So what became of Blanc and his method? The answer's a surprise. For one thing, Blanc wasn't first to make muskets this way. Various French makers had worked on the idea since 1720. Furthermore, Blanc went into business and, by the time Whitney made his demonstration, was producing 10,000 muskets a year for Napoleon.

Then, in 1806, the French government *sacked* the whole process. Why? By using *unskilled* labour, Blanc's method had made manufacturers independent of government control over the old *crafts*. The government raised the *arcane* argument that workers who don't function as a whole can't produce harmonious products.

	<i>gave it up</i>
	<i>swindle</i>
<i>producing ...</i>	<i>*see list</i>
<i>*see list</i>	
	<i>sadly calls us to mind</i>
<i>innovation ..</i>	<i>*see list</i> <i>advance</i>
<i>guns</i>	
<i>*see list</i>	
<i>boxes</i>	
<i>put together</i>	
<i>by chance</i>	
<i>simulating ...</i>	<i>handmade</i>
<i>supply</i>	
<i>guns ...</i>	<i>interchanged</i>
<i>products</i>	
<i>*see list ...</i>	<i>*see list</i>
<i>dropped</i>	
<i>untrained</i>	
<i>trades ...</i>	<i>obscure</i>

They simply declared that Blanc's method wasn't working and they *scrapped* it.

Meanwhile, America built upon Whitney's *scam*. By 1850, English visitors back from America described what they now called the American System of Manufacture. When they told the French about our use of interchangeable parts, they found the French military had never even heard of it. The French had buried it completely!

The story *grimly reminds us* that technology doesn't *progress* in simple logical ways. Our choices depend on a hundred subjective matters, and they are only thinly influenced by what works best. ■

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Dieser Text ist Teil der Radioserie „Engines of Our Ingenuity“ und wird hier mit freundlicher Genehmigung des Autors und der Radiostation KUHF wiedergegeben. Den Originaltext und weitere 2400 Kurzberichte über die Geschichte der Technik finden Sie unter [www.uh.edu/engines](http://www.uh.edu/engines)

<i>arcane</i>	<i>obskur, undurchschaubar</i>
<i>assemble, to</i>	<i>montieren</i>
<i>assembly</i>	<i>Montage</i>
<i>at random</i>	<i>willkürlich, zufällig</i>
<i>bin</i>	<i>Behälter, Kasten</i>
<i>craft</i>	<i>Handwerk</i>
<i>deliver, to</i>	<i>ausliefern, übergeben</i>
<i>fake, to</i>	<i>fälschen, vortäuschen</i>
<i>grimly</i>	<i>trostlos, schlimm</i>
<i>gunsmith</i>	<i>Büchsenmacher</i>
<i>hand-crafted</i>	<i>von Hand gemacht</i>
<i>interchangeable</i>	<i>austauschbar</i>
<i>invention</i>	<i>Erfindung</i>
<i>manufacturing</i>	<i>Fertigung, Produktion</i>
<i>merchandise</i>	<i>Ware, Güter</i>
<i>musket</i>	<i>Flinte, Muskete</i>
<i>progress, to</i>	<i>fortschreiten, sich bewegen</i>
<i>remind, to</i>	<i>erinnern</i>
<i>rifle</i>	<i>Gewehr</i>
<i>sack, to</i>	<i>rausschmeißen</i>
<i>scam</i>	<i>Betrug</i>
<i>scrap, to</i>	<i>aufgeben</i>
<i>sewing machine</i>	<i>Nähmaschine</i>
<i>swap, to</i>	<i>austauschen, wechseln</i>
<i>type</i>	<i>Letter</i>
<i>typewriter</i>	<i>Schreibmaschine</i>
<i>unskilled</i>	<i>ungelehrt</i>