

Grasping Reality with Both Hands

The weblog
of Brad DeLong. Since 1999.
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Howes: The Spanish Engine—Noted

Anton Howes: *The Spanish Engine* <https://antonhowes.substack.com/p/age-of-invention-the-spanish-engine>: ‘Jerónimo de Ayanz y Beaumont.... The steam engines invented by Savery and then Newcomen in the 1690s and 1700s mainly exploited the observation that the air had a weight...

...the main force was applied, not by the steam itself doing the pushing, but by the steam within a tank being doused in cold water, causing it to rapidly condense. The resulting partial vacuum meant that it was the weight of the air—the atmospheric pressure—that did the real lifting work. Rather than using hot steam to push, these engines used its condensation to suck. For Newcomen, this pulling effect happened under a piston in a cylinder, with the piston driving a beam up and down, which in turn worked a pump all the way down the mine....

Ayanz’s machine, on the other hand... “did not contemplate the possibility of utilizing a supplementary source of pressure—that of the atmosphere”. And nor could he have, for Ayanz was tinkering with steam devices decades before atmospheric pressure was sufficiently understood. It’s a very clear case of how the lack of science limited the technological possibilities...

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