Neues System der fortschaffenden Mechanik

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The story of technological innovation is often deeply rooted in a broader economic and political context. The solution to the longitude problem, for example, held the key to the successful expansion of the global market by reducing the loss of ships at sea. Or, the introduction of the steam engine simultaneously helped cut the cost and raise the level of production in countless applications that previously relied on the power of horses or man.

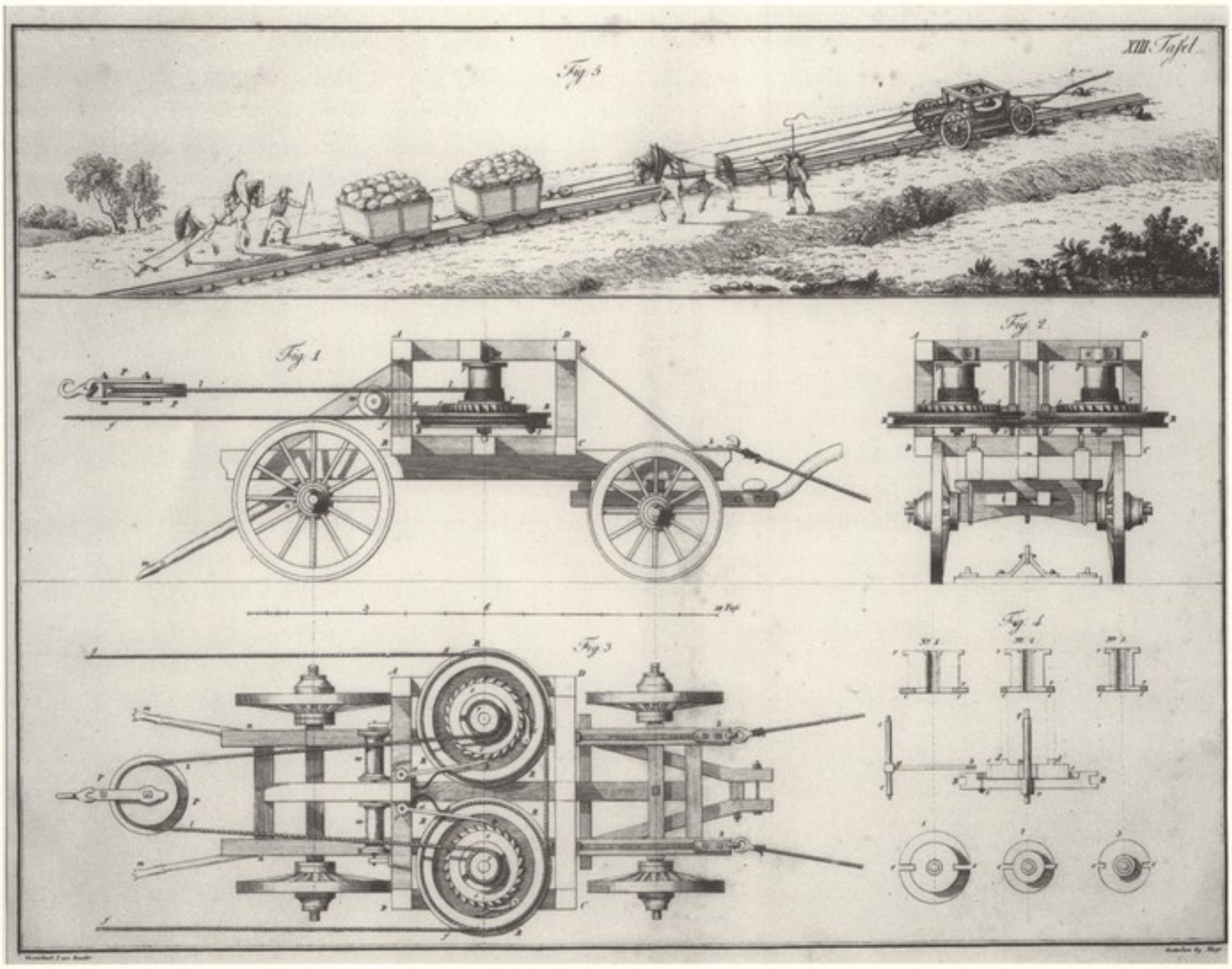
Economics was an especially strong catalyst in the development of technology for transport, whether it concerned moving raw materials, delivering goods to remote markets, or conveying passengers. The acquisition of Joseph Ritter von Baader' s impressive text describing the advantages of railways over canals provides a valuable new resource in the history of technology, while building on a solid core of early railway and mining history both in the Kress Collection and in the Baker Library.

Baader (1763-1835) began his studies in medicine at Göttingen. He turned his attention to civil engineering, however, after studying mathematics and physics in Edinburgh between 1787 and 1795. It was during this time that he was exposed to the most recent technological advances occurring in Great Britain, including early steam engine experiments. Returning from his studies abroad, Baader became the director of Mechanical Engineering and Mining in Bavaria in 1798 and quickly established himself as a respected mining engineer. He was even called to Paris by Napoleon in 1805 to provide plans for new waterworks machinery.

Using his knowledge and experience in mining transport technology, Baader became an influential and outspoken advocate of railways in Germany as early as 1807. He traveled again to England, between 1815 and 1817, to closely study the technology of English mining railways, which used carts pulled along metal rails by horses. He is perhaps best known for his suggestion to construct a horse-powered iron railroad between Nürnberg and Fürth. The Nürnberg-Fürth railway line would later become the first short railway track to be built in Germany.

By 1822, Baader was ready to publish his most important work, *Neues System der fortschaffenden Mechanik, oder vollstaendige Beschreibung neuerfundener Eisenbahnen und Wagen mit verschiedenen andern neuen Vorrichtungen, mittelst welche der innere Transport aller Waaren und Produkte fast überall so gut und mit weit geringern Kosten und Schwierigkeiten als durch schiffbare Kanäle befördet und erleichtert werden kann*. The text is a remarkably extensive project, presenting the advantages of railways over canals, providing an early history of British railways, analyzing the comparative costs of canals and railways, and describing a variety of new innovations in rails, carts, and sources of motive power. While Baader experimented with many types of railway construction and sources of power, he remained skeptical of the reliability and efficiency of steam engines for most of his career. All of the power to move carts in Baader's designs for this book is drawn from either animals or man.

The truly fascinating characteristic of this book, however, lies in its patron: Czar Alexander I of Russia. In the preface, Baader describes an occasion on which he had the opportunity to show Alexander one of his scale models, which greatly impressed the monarch. When Baader approached Alexander the following year with his idea of writing on the subject of railways, his endeavor was



Above: an illustration from the Neues System *shows the design and use of a special car designed to ease the labor of horses drawing railcars uphill.*

immediately and generously supported. According to the subscription list printed in the text, one hundred advance copies were to be prepared for Alexander, and an additional eleven would be distributed to nine other dignitaries. In addition, another twenty-six deluxe copies "auf Velin-Papier mit illuminirten Kupfern" and twenty-two plain copies "auf Schreib-Papier mit schwarzen Kupfern" were promised. Twenty of the deluxe copies were intended for the king of Bavaria, while the majority ofthe plain copies were destined for academic libraries as well as several German booksellers. In total, only 159 copies would be available. The book was privately printed in Munich in 1822.

The Baker Library copy is beautifully bound in green, patterned sheepskin, with gilded borders, decorated flat spine, and all edges gilt. It is a folio printed largely on blue paper and includes a finely engraved title page. Accompanying the text is an oversized atlas with sixteen large engraved plates depicting various new innovations in rail and cart technology. The stamp and shelflist mark of the Freiberg Bergakademie both appear prominently on the volume of plates. There is no provenance evidence at all in the text volume.

The early 1820s were toward the end of Alexander's life but at the early stages of railway history in Russia, where railroads would soon play a leading role in the industrial growth of the country. Railways had been used for mining opera-

tions In i, but a greater reliance had been placed on the traditional infrastructure of canals and roads. Alexander, in particular, was influential in improving the roads. Baader's experiences building railways in the mountains of Bavaria were well suited to the challenges of constructing railways in Russia, and his ideas obviously appealed to the czar. Unfortunately, Alexander died in 1825, leaving uncompleted whatever plans he may have had for improvements in Russian rail transportation. His successor, Nicholas I, would help shape a national approach to railways and promote the idea of an extensive railway system for Russia in the 1830s.

Like all materials in the Kress Collection, Baader's *Neues System der fortschaffenden Mechanik* . . . is available to researchers in the Historical Collections Reading Room, Baker Library Room 100. Only a small portion of the Kress Collection is represented online at this time. There is a five-volume printed catalog of the collection, the last supplement of which was published in 1967. The card catalog, available in the Reading Room, remains the only comprehensive point of access to the collection while we are in the process of completing the online cataloging. For more information about the Kress Collection, please visit us at http://www.library.hbs.edu/hc/kress.htm or contact Karen Bailey at kbailey@hbs.edu, 617-435-9333 or 617-495-6411.

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