

John Oldham: The Coupling Personified

Ireland is known for many things—the Book of Kells; peat bogs; gifted writers; drunken writers; gifted-and-drunken writers; Guinness Stout; bewitching music; and ever so much more. What you may not know about the Emerald Isle is that a widely used—and most effective power transmission component—was invented by an Irishman way back in the mid-19th century.

Meet John Oldham (no middle name—odd for an Irish Catholic; but on the other hand, was reported to have sired 17 children—but with whom, typical of the times, is not mentioned): engineer, engraver, philosopher, Royal Dublin Society member, miniatures painter *and*—inventor of the eponymous *Oldham coupling*.

Dublin-born in 1779, Oldham began as an engraver's apprentice before soon going on to invent a serialization (sequencing) machine intended to prevent the forgery of bank notes. Then, off on another creative path, in 1807 he created what he called an "eidograph," which, it was said, "upon being applied to one's face, would delineate the most expressive and animated miniature with unequalled accuracy and expedition." (Or as Webster puts it: *An instrument for copying drawings on the same or a different scale; a form of the pantograph.*)

As for his "artist's life," he exhibited five miniatures at the Parliament House in 1801, and was referred to, in a review of the exhibition in the *Freeman's Journal*, as "a young artist, now for the first time before the public, advancing with rapid strides."

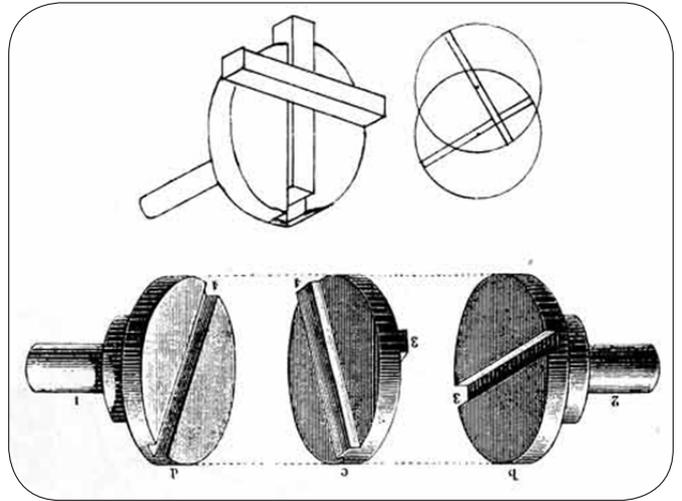
His sequencing machine was acquired in 1812 by the Bank of Ireland, where he was also appointed engineer and chief engraver. But while still in the banking industry, Oldham was doing a lot more than counting banknotes, eidographs notwithstanding. Having a keen interest in marine propulsion, in 1817 he obtained a patent (No. 4169) for a device he had designed for propelling ships by means of paddles powered by a steam-engine—the ob-

ject being to imitate the motion of a paddle when used in the ordinary way. In 1820 he then patented an improved model—or coupling, the word not yet invented—(Patent No. 4249), which called for the paddles to be placed on a shaft across the ship, which were then steam-powered to revolve, being feathered by an adaptation of the gearing used in his earlier design.

Though described in a report at that time as a "very imperfect contrivance"—by a Brit perhaps?—Oldham's coupling was in fact used in the power transmission design of the *Aaron Manby*. The steam-powered vessel, according to *oxfordindex.com*, represented "the first time that iron plates, and not wood, had been used to construct a seagoing ship—a landmark in the science of shipbuilding."

Built in 1822 at England's Horsely Iron Works, Oldham's invention was later described in an 1885 edition of the *British Proceedings: Institution of Mechanical Engineers* as "feathering-float paddle wheels." And with the help of Oldham's coupling, according to *gracesguide.co.uk*,

"Defying the prevailing wisdom of the day, the iron-hulled vessel not only floated but made nine knots and drew one foot less water than any other steamboat then operating."



Original Oldham coupling built before 1840, using a cross (instead of a center disk), as sketched by Robert Willis in personal copy of his *Principles of Mechanism*, Figure 39 (London, 1841, p. 167). Bottom: Oldham coupling as illustrated in Alexander B. W. Kennedy's, *Kinematics of Machinery*, a translation of Franz Reuleaux' *Theoretische Kinematik* (London, 1876, pp. 315–316).

Today, nearly 200 years after Oldham introduced his coupling, the man is still getting his props, as evidenced by a 21st century description of the component on *cnmentor.com*: "An Oldham coupler is a mechanical device which transmits rotary motion between shafts that are parallel but not always in perfect alignment. The Oldham coupler is built around three discs, one coupled to the input, one coupled to the output, and a middle disc that is joined to the first two by tongue and groove. The tongue and groove on one side is perpendicular to the tongue, and groove on the other. Often springs are used to reduce backlash of the mechanism. The coupler is much more compact than, for example, two universal joints. Its name originates from the Irish inventor, John Oldham."

Oldham went on to become a life member of the Royal Dublin Society beginning in 1827, also serving for a time on its natural philosophy committee (1829–32) during which he designed a "mechanical water supply system" for the society's botanic garden.

He moved on to London in 1837, where he worked for the Bank of England. He died there at his home on Valentine's Day, 1840, leaving behind an impressive legacy and—equally impressive—those 17 offspring. **PTE**