

Ironclad Gears

Gear Technology's bimonthly aberration — gear trivia, humor, weirdness and oddments for the edification and amusement of our readers. Contributions are welcome.

This issue of Addendum is dedicated to gears that have served their country. There have been many, but among the most significant are surely those at work during the Civil War, when their application changed the nature of naval warfare forever. It's time to recall that role, namely, powering the revolving turret of the *U.S.S. Monitor*, one of the first "ironclad" vessels.

Before we get a lot of angry letters, please note that the Addendum staff wishes to remain neutral in any disagreements which still attach themselves to "The Late Unpleasantness." We have loved and respected ancestors on both sides of the conflict (though, contrary to office rumor, we are not old enough to have personally participated).

For the record, the Confederate Navy was first out of the blocks with an ironclad, the *Manassas*. *C.N.S. Virginia* (the *Merrimack* to those of the Yankee persuasion) destroyed much of the Union fleet in Hampton Roads, VA, and it was in response to this action that the *Monitor* was rushed to the scene. The *Monitor* and the *Virginia* fought to a draw there on March 9, 1862. The ironcladding on both ships was equally effective; the seaworthiness of both equally deplorable.

Having said that, Addendum has taken a special interest in the *Monitor* because of its unique revolving gun turret, which held heavy guns mounted on a revolving floor that would bring them to bear over 360°. While the idea needed much refin-

ing later, it marked the beginning of modern naval gunnery and warfare.

The *Monitor* was built by Swedish engineer John Ericsson, who claimed ownership of the entire design, including the turret, although later historians have argued that the real credit for the turret goes to New Yorker Theodore Timby, who had been working on the idea of a revolving gun battery since 1841. (See *Civil War Times Illustrated*, June, 1997, for all the juicy details.)

But the fact remains that Ericsson took the praise when the *Monitor*, which resembled "a cheese box on a raft," left the New York Navy Yard in early 1862.

The turret (the cheese box) was basically a revolving turntable that held two 11" Dahlgren guns, which were capable of firing 166-lb. solid shot a distance of one mile. At rest, the turret sat on a brass ring set into the raft deck. In combat, the crew screwed in a wedge-shaped "key" that jacked up the turret shaft, resting its entire 160 tons on the central spindle. Steam power from the ship's main boilers drove the donkey engine that moved the turret mechanism, a gear assembly which could rotate the turret at 2 1/2 rpm.

Addendum hasn't been able to see detailed drawings of the gear assembly, but according to Mark F. Jenkins, Webmaster of the Civil War Ironclad Page on the World Wide Web (<http://members.aol.com/MaxDemon88/ironclad.html>), the assembly consisted of "a short vertical crankshaft attached to the turret engine aft of the central



spindle," which drove a four-gear assembly, the largest gear of which was mounted around the spindle itself. Jenkins estimates that this spindle gear was about 6.5' in diameter. The turret itself had an exterior diameter of 21.5'.

The *Monitor's* turret revolved once every 24 seconds, but was very difficult to stop on a precise bearing. In fact, during the engagement with the *Virginia*, the turret was left stationary. On the other hand, another ironclad, the *Neosho*, had a turret of very similar design which was said to revolve every 13 seconds, and her commander claimed to have "found no difficulty in stopping her on any object . . . and even when revolving fast, I could stop her so that the slightest turn either way would bring the guns to bear where I wished."

Martha Stewart Revisited

Tom Spenner, M.E., of Racine, WI, has an alternative approach to preserving your back issues. Concerned about punching holes in the magazine (our office puncher worked fine, but perhaps a smaller model would not), he suggests putting each issue in a C-Line #62018 Non-Glare sheet protector. He also recommends a 3" D-ring binder, which holds at least one more year than a 2" model.

Mercifully, no one has shared their pattern for crocheted binder covers yet. Thanks. ☺

The Addendometer: If you've read this far on the page and enjoyed it, please circle 225.

