



MAINS'L HAUL



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AYE, THEY SHALL SPIN AGAIN!

The crank-throw gives the double-bass, the feed-pump
sobs and heaves
An' now the main eccentrics start their quarrel
on the sheaves;
Her time, her own appointed time, the rocking
link-head bides,
Till — hear that note? — the rod's return whings
glimmerin' through the guides!

— Kipling: *Mc Andrews' Hymn* (1893)

There's a lot of quiet activity — and some of it not so quiet — in the cold engineroom of our famous old ferryboat *Berkeley*, and one of these days you are going to see a maritime museum exhibit with considerable dramatic impact.

The *Berkeley*, as you know, was powered with a triple-expansion, reciprocating steam engine. And you might say that the triple-expansion engine was to the age of steam what the clipper ship was to the age of sail; Kipling once remarked that it was man's most noble achievement. It was the engine of the ocean liner, of the early battleship and cruiser and torpedo-boat and of the plodding, World-ranging tramp freighter. Probably the biggest liner with a TE power-plant was Norddeutscher-Lloyd's 14,350-ton *Kaiser Wilhelm der Grosse* of 1897; she was also, incidentally, the first transatlantic liner with four stacks. Unfortunately for "man's most noble achievement" 1897 also was the year when Sir Charles Parsons unveiled his experimental turbine steamer *Turbinia*, and all but broke up the naval review at Spithead by showing a speed of 34½ knots. Although it would survive for many years, as of 1897 the huge up-and-downer was on its way out. But we've got one!

And what is a triple-expansion engine? Simply, it is one in which the steam expands (and so pushes a piston) three times, in three successive cylinders. A century ago, someone realized that the exhaust steam from an engine's cylinder still had quite a bit of oomph — so why not put it to work? Some say that the steam whaler *Balearic* of 1881 had the first triple-expansion engine — but Gregg Chandler has found a reference to a small French craft of ten years earlier, with this revolutionary type of engine.

So that the dwindling pressure in each succeeding cylinder would not produce horrifying vibration, they made each cylinder bigger than the one before it, thus equalizing the thrust. Our high-pressure cylinder is 24 inches in diameter; the intermediate-pressure cylinder is 32 inches and the last, or low-pressure one, is 56 inches. How would you like it if your car had cylinders five and a half feet across, and with a three-foot stroke?

The steam came in from the boilers at 165 pounds to the inch, and the reduction in pressure was described to us, beauti-



No, Junior, this is not a gnome emerging from a cave; it is our hard-working Port Engineer, Ed Paxton, climbing out of the low-pressure cylinder of the *Berkeley's* main engine. Behind him, suspended by two chains, is the massive cylinder-cover. (Photo by Roscoe Smith)

fully, by a delightful Scottish engineer who visited San Diego a few years ago:

"Th' steam enters the high-pressure cylinder at a hunnert an' sixty-five pounds. It exhausts into the intermediate cylinder at, say, eighty-five pounds, an' on into the low-pressure cylinder. An' noo, we're thinkin' in tairms o' fifteen pounds." He was a charming man, who started putting in with the old Scots whiskey as soon as the sun was on the main yard. When we parted at around 10 that night he was still as it — and as sober as a judge. Losh! Th' mon's innards must be lined wi' copper!