A SPELL TO EXORCISE THE DEMON OF SEASICKNESS

Scourge of Travel Doomed If This Invention, Which the Hamburg-American Is to Install on Its New Liner Europa, Does All That Is Claimed for It.

IT HAS been said that a fortune lies waiting for the man who can invent a cure for seasickness, and it may be added with perfect safety that any one who has suffered from that most detestable of false-alarm ailments is quite willing to subscribe toward that fortune. Whether the medical world is any nearer finding the cure has not been stated of late, but, on the other hand, we hear much of schemes for eliminating the causes of seasickness, if not the disease itself.

Not long ago the gyroscope was to be attached to seagoing ships in order to prevent them from rolling and relieve passengers from the throes of mal de mer. It was a German who evolved that. And now another German comes to the fore with a device which, he avers, is the most efficacious ever invented for vanquishing the dread disease of the ocean.

Judging from the success of the preliminary tests of the device there is some cause for his assertion. After having been tried a year in all sorts of weather on several German ocean-going steamers, it is to be installed on the new 50,000-ton ocean leviathan Europa, now in process of construction in Germany for the Hamburg-American Line, which will use it between New York and Hamburg.

Besides, the device is soon to be installed on the Deutschland, in her palmy days the fleetest of trans-Atlantic gray-hounds, now renamed the Victoria Luise and destined for tourist cruises only; also on the Kaiserin Auguste Victoria and others of the company's fleet.

The device in question is the invention of Herr H. Frahm, a Hamburg engineer. It consists of two tanks, located athwartships, one on each side of a vessel, and connected with each other, as in the illustration. An expert said recently that the Frahm invention may be described as "a ship carrying her own waves." These waves, carried in the tanks, counteract to a very appreciable extent the action of the waves of the sea beating against the sides of the ship, and thus considerably reduce the ship's rolling.

If you take a glass, fill it half full of water, and strike your finger against one side of it you will notice that the water in the glass tends to rise on the side of the glass that is struck. In the Frahm invention the tanks correspond roughly to the glass, the impact of the waves against the side of the ship to the blow dealt the glass by your hand.

In the case of the ship, however, when the blow is dealt and the water that is in the tank located on that side of the vessel rises against the side that is struck, it is backed up by the whole pressure of the water from the connected tank, which immediately fills the vacuum created thus providing an excellent counter-force to the ocean's waves.

Herr Frahm, inventor of the anti-rolling tanks, read a paper recently before the Institution of Naval Architects at London, which gave a full description of his invention. Though couched in rather technical language, his description gives a good general idea of what the device looks like and how it works.

After stating that his invention counteracted the rolling of ships at sea by means of water oscillating in tanks, Herr Frahm said:

"This result has been obtained by the most careful application of the laws of resonance. Under the effects of resonance, bodies that can oscillate about a vidual oscillations. Large heeling amplitudes can only be produced on a ship if she is struck by a series of comparatively regular waves, and struck in the measure of her individual number of oscillations. Under such circumstances the influence of resonance will be promptly felt, and there will be an increase of the angle of heeling from wave to wave. All large rolling amplitudes observed in practical seafaring are due merely to the influence of resonance between wave and vessel.

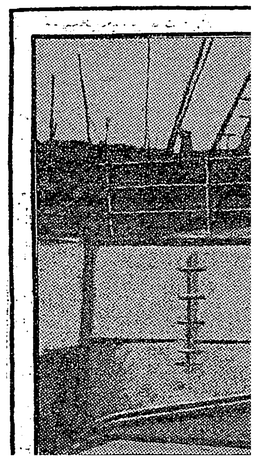
"On this fact the present device has been based. It utilizes a secondary and artificial resonance in order to annihilate the influence of the primary resonance between waves and ship. This secondary resonance is introduced by means of a U-shaped tank, located athwartship and extending from side to side, in which a water column can oscillate with the same number of swings per minute that are peculiar to the ship herself. The ship will heel only as far as the water, under the action of secondary resonance, rises or falls in the vertical tanks to such an extent that the heeling moment imparted to the ship by the waves is balanced by the opposite turning moment, produced by the oscillations of the water.

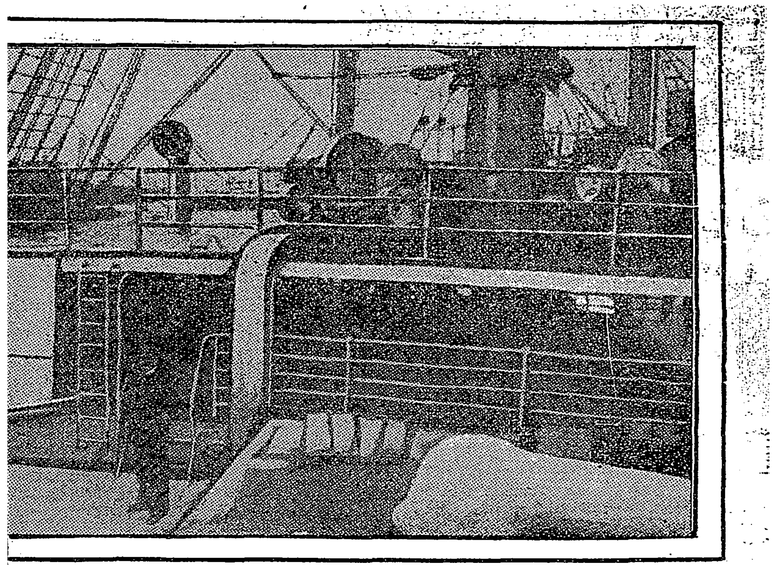
"The increment of heeling, from impulse to impulse, in a free ship, cannot take place now, and the rolling motions will be limited to such as will be sufficient to produce the necessary oscillations of the tank water."

It is pointed out that the new invention should work particularly well on big ocean liners, since they roll very little anyhow, and anything installed on them that tends to reduce this motion has a better chance to succeed than where the rolling is more marked, as on smaller vessels.

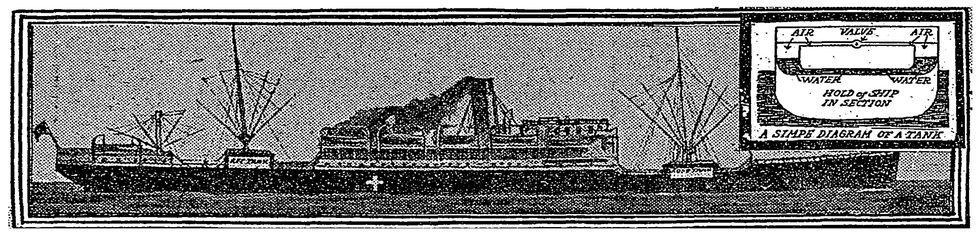
Another advantage which is claimed for the Frahm device is its adaptability to warships. If the rolling of such craft should be eliminated or appreciably lessened, those interested maintain that the marksmanship of gunners ought to improve in a direct ratio.

The new device has been actually tried out on several vessels, among them the Hamburg-American steamers Ypiranga and Corcovado, plying between Europe and South American ports, and the England of the German East African line.

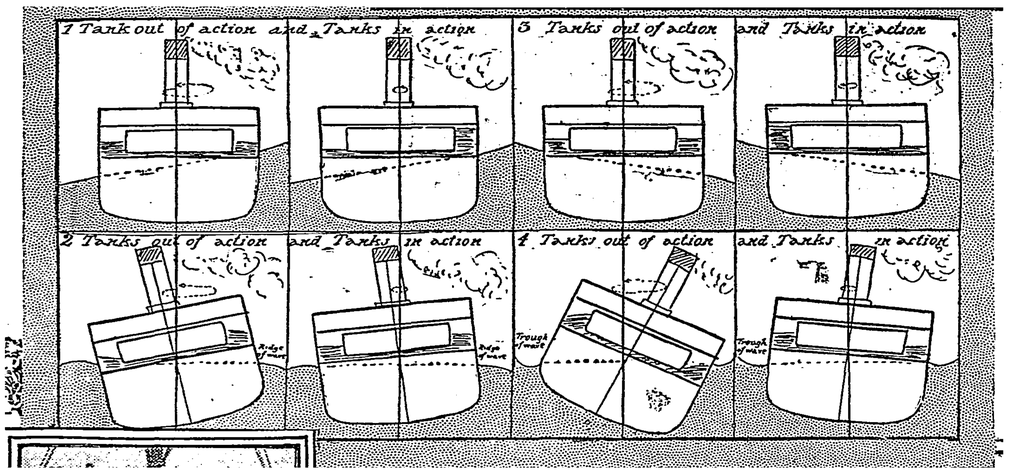




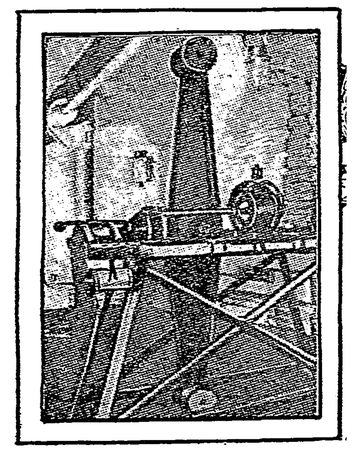
The Fore Anti-rolling Tank on the Ypiranga.



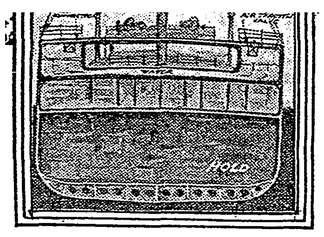
The Ypiranga of the Hamburg-American Line on Which Anti-rolling Tanks Were Successfully Tried Out.



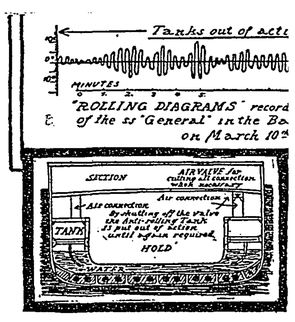
Diagrams Showing Ship's Position with and Without Tanks in Action.

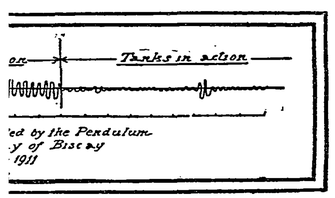


Roll Pendulum for Recording the Rolling Motions of the Ship.



Anti-rolling Tank on German East African Liner "General."





condition of equilibrium are made to swing severely under comparatively small impulses, as soon as the period of oscillation of the impulse is synchronous with the individual periods of the respective bodies. A ship constitutes a body of this kind, as she will oscillate under the impulse of the waves.

"As is well known, a ship will roll almost exactly in the periods of her individual oscillations.

On the Ypiranga instruments were installed which registered the exact degree of oscillation of the ship both when the anti-rolling tanks were in action and when their usefulness was temporarily suspended, which latter result is brought about by shutting off the connection between the two tanks.

The Ypiranga, being of only 8,000 tons burden, was much more subject to rolling than bigger ships. Here is the report of her captain on the results obtained from the use of anti-rolling tanks:

"On the voyage from Southampton to Vigo the lateral motion movement did not exceed 8 degrees. Owing to repairs which had to be made to the rolling tank, located aft, its use had to be discontinued for a while, and the lateral motion rose immediately to 13 degrees on both sides of the vessel. Owing to the fact that a northwesterly gale sprang up, causing a very rough sea, it was not thought advisable to discontinue using the forward rolling tank."

On the return voyage of the Ypiranga the captain had some more interesting information to impart. He encountered a strong northwesterly gale and high seas. In order to test the efficacy of the rolling tanks he decided to stop using both of them for a while. Here is what he reported:

"With both tanks at work the lateral motion of the steamer was 3 to 4 degrees on both sides. When only one tank was used it rose to 5 or 6 degrees. When both the tanks were stopped it went up to between 13 and 14 degrees.

"On the following day the experiment was repeated, after the sea had calmed down. With both tanks stopped, the vessel rolled 10 degrees. When one tank worked, it rolled 3 degrees; with both at work, 2 degrees."

As may be imagined, the delight of the passengers at the success of the experiments was unbounded.

That there has always been a great demand for something that would prevent ships from rolling at sea is evidenced by the number of schemes that have been evolved to attain this devoutly-to-be-wished consummation. Of these, not a few have actually been tried.

That which utilized the gyroscope attracted much attention here and abroad. As is well known, the gyroscope is a top that spins within a ring. From the fact that it keeps its equilibrium in any position its applicability to the lessening of the rolling of ships is easily seen.

Gyroscopes were installed on German war vessels and on a few passenger ships. The ring was hung at right angles to the line of the vessel's direction on a horizontal axis. The gyroscopes used were necessarily of immense size and were driven by steam or electricity at a tremendous velocity.

The device was found to counteract the action of the waves to a considerable degree, but it had a serious defect, viz: if anything connected with the mechanism should break, through any cause, there was danger of the great gyroscope tearing a hole in the ship it was designed to steady, and, possibly, sending her to the bottom.

This possibility, according to a maritime expert, was sufficient, in some cases, to deter shipping companies from installing the device.

A number of devices, antedating the gyroscope and the Frahm invention, promised well for a time, but subsequently vanished from the ken of seafarers. A batch of descriptions of these was rounded up not long ago by a writer in the magazine, Shipping Illustrated. Some were certainly curious products of the inventor's brain.

The English Channel was responsible for the exercise of much ingenuity on the part of inventors anxious to benefit passengers crossing its choppy and discomforting waters. One of the earliest and most eccentric craft ever designed to vanquish the Channel waves was the steamship Connector, built in 1863. It was a jointed steamer, its sections being practically independent, hinged together in such a way as to diminish pitching and rolling.

The builders of this remarkable craft thought she would not only be attractive the sufferers from mal de mer, but would prove of value in cargo transportation, since sections might be disconnected and sent to different ports, just as some cars of a railroad train go to one place and some to another.

The Connector made a number of trips, but was not remarkable for speed, and failed to pay much attention to her helm. Nor did her appearance as she slid over the waves, one part in the trough and another on the crest, like a huge snake, give the idea that those on board were exempt from the qualms of seasickness.

In 1866 attention was diverted from her by the Ross Winans, built at Millwall, England, for the Imperial Yacht Club of St. Petersburg. She was a steam yacht, shaped like a cigar. Her screw shaft was located on the axis of the cigar, and there was a propeller at each end. For her launching a special cradle had to be constructed.

After dashing about for a while, she, too, disappeared from view, to be followed by Capt. Dicey's Channel steamer, which had two parallel hulls connected by girders. The hulls were 35 feet apart, with paddles working between them. Dicey got his idea from the outrigger boats used by South Sea Islanders.

Later, Andrew Leslie applied the same principle in a Channel steamer called the Calais-Dover from the ports between which it plied. Both this craft and Dicey's proved to be steadier than the ordinary type of Channel steamer, but were not successful enough in other ways to justify the building of more boats along similar lines.

In 1875 a vessel called the Bessemer made her appearance on the English Channel, making her first run to Calais on May 8 of that year with 200 passengers on board. She was equipped with a hydraulic device for keeping the passengers' saloon upright. This saloon was hung in a great well in the steamer's hull, and rested on two pivots, fore and aft.

That sounded finely, but there were no more Bessemers. Soon the same old rollers, bearing the same crowds of greenish-hued, despondent passengers had a monopoly of the Channel trade.

Later, Sir John Thornycroft invented a device which he thought would serve to steady his steam yacht, to which he attached it. It was an oscillating ballast tank, regulated by a hydraulic piston, varying its position according to the swing of the vessel.

After experimenting for some time with his invention, Sir John declared that he had reduced the rolling of his yacht by about one-half.

Whether the Frahm anti-rolling tanks will prove to be the solution of the problem which has so long baffled inventors, or whether they will sink into oblivion remains to be seen. Anyhow, they are to the fore just now, and promise to be even more in the public eye within the next few years.

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