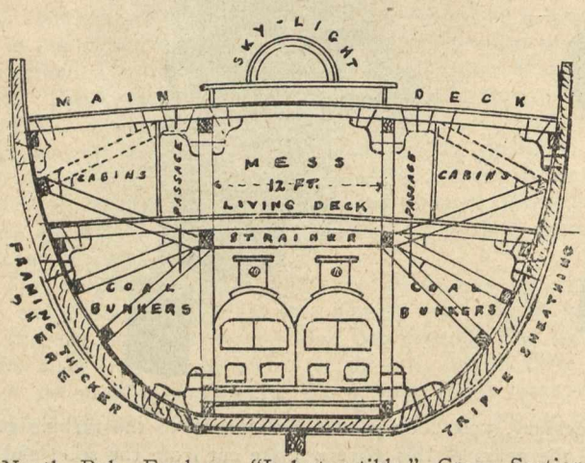
Each governor will control four 51 inch horizontal cylinder gate turbines, operating the full range of gate in five seconds. Each set of four wheels is connected to 1500 K.W. generator. Two of the small vertical governors are installed on the exciter units. This governor is made by the Woodward Governor Co., Rockford, Ill.

A VESSEL FOR NORTH POLAR NAVIGATION AND DISCOVERY.

BY CHAS. BAILLAIRGE, C.E., EX-PRESIDENT OF THE QUEBEC GEOGRAPHICAL SOCIETY.

Some months ago there appeared in your columns an article of mine on Bernier's proposed voyage to the North Pole, detailing how he was to steer to get there, and what he had to do in the astronomical way to locate the exact position of the Pole, and prove that he had actually solved the problem, or stood on that particular point of the earth's surface where, during 24 consecutive hours, "Polaris," or the so-called North Polar star, had been observed to remain, during a whole revolution of the earth at its exact elongation (co-declination) from the polar zenith or true pole of the heavens. You also, on another occasion, after an interview with the captain, published diagrams of his proposed vessel, that is in regard to its size, tonnage, cut and rig. Now, sir, the only really important feature in a vessel for this purpose is its cross-section, with sloping sides to allow of a pressure of ice, having a tendency rather to lift it than to crush it in, and such that any such crushing tendency of the ice be counteracted or prevented by a proper system of inside strutting or staying.

At the last meeting of the Quebec Geographical Society, held to hear Capt. Bernier and have him explain his plans, he submitted for the consideration of the society and of the engineers present, plans made by a German engineer for one of the South Polar expeditions, as also an improvement on this in point of ice resisting capacity, by a Mr. Auger, one of Quebec's best shipbuilders. Now this vessel is trussed



North Pole Explorer "Indestructible," Cross Section Amid-Ships.

Centre of vessel throughout, clear of all obstructions but masts, for engines, boilers, carpenters, machinists, etc. below, and mess, kitchen, larders, smoker, cabins, etc. above.

Trussed frames of 12" x 12" timber at 4 ft. centres whole length of vessel leaving 3 ft. clear between them for bunks, cabins, stairs, scuttles, etc. Passages run whole length both sides.

in a way to leave the hold free of obstruction for boilers, engines, coal, etc., but in a way to render it dangerous in so far that any tendency to upheave the bottom or bilge of the vessel by ice pressure would have nothing to counteract it from within, and such again that the decks and bottom being absolutely unconnected, the action of the lower stanchions would be such as to force up the decks in case of a tight hug from without.

I therefore now send you an amended section of how I consider the hull should be stanchioned, stayed or strutted, braced and bound into one solid, unyielding and absolutely indestructible system of framework, while, as stated in legend on diagram, leaving the whole centre of the vessel, throughout its entire length, completely free of any obstruction whatever to its internal economy. The trussed bents or ribs or members of the vessel are at 4-ft. centres, and supposed to be of stout, or say 10 to 12 inch timbers, while the intermediate spaces, composed of say three ribs or members of double timbers, breaking joints, and covered on the outside with triple sheathing, must be considered capable of resisting any force to be brought to bear on a space of only three feet square; in fact of only 18 inches radius, the spaces between the abutting points of deck beams, struts and braces, being, by the system of stiffening used, reduced to that just mentioned, throughout the whole length of the vessel and over so much of its height or depth of hull as likely to be ice bound. The whole system of bracing to each and every of the trussed members is in one and the same vertical plane, and abutting against the strainers as shown. This system of construction is such, while rendering the vessel indestructible by ice pressure, as to allow of division of the interior into rooms, cabins, closets, wardrobes, stairways, hatches, coal or other shutes; the spaces between the trussed members being ample for berths or bunks, or clubbing them together in twos, threes or fours, for cabins for the men and officers of the expedition. Again, these 3-ft. spaces between trussed members are just suited to the storage and piling up of barrels of oil, pork, fish and other provisions, while the central portion of the vessel all along can be devoted below to boilers, engines, carpenters' and engineers' workshops, etc., and on the living deck, to mess and other rooms, kitchen, captain's room, chart and compass rooms, etc. The side passages shown in section on living deck run full length of vessel, thus rendering communication easy in any direction, and along which barrels of the lighter provisions, as biscuits, etc., may be freely rolled until just opposite the 3-ft. compartment they are to be stowed in; a similarly floored space being made below for the barrowing of coal to boilers, or for other purposes.

If, notwithstanding the vessel's indestructible make-up, it be considered prudent to separate it into water-tight compartments, nothing will prevent this from being done, with doors in the bulkheads at passages, and at this higher level, affording more time to get at and close on an emergency; with corresponding doors below, though as high as possible from the bottom of the hold, to allow of some flooding before the water reaches them and thus again giving time to slide the doors to or close them as required. There should at any rate be a longitudinal bulkhead between boilers, so that in case of a rush of water extinguishing the fires on one side, the others may remain in working order, and allow the vessel to proceed at half speed while repairing the breach.

The only other pertinent suggestion the writer would make, is that the vessel be canvassed, as it is now proposed to do with freighters in the United States, that is, without top rails of any kind, and in a way that all work may be done from the main deck, as in such a climate it ill befits a heavily and awkwardly bemittened man to have to go aloft to furl and unfurl sails, and because, what is just as important, if not more so, only half the hands are required to manipulate the sails from deck level, or when not necessary to go aloft for the purpose.

Capt. Bernier has been indefatigable in his endeavors to raise the funds for his expedition, and there has been a tendency to wait and see whether this and that one would be successful in the proposed discovery of the end of the earth's axis, but Peary and Baldwin have returned, and the problem is still unsolved. Bernier, I believe, saw Ziegler in relation to a subscription for the purpose. Ziegler, of course, could not well accede to this proposition while patronizing an American venture, but said, so I understood, "if Baldwin does not succeed I am bound to be successful, and you can then come to me and we shall see." "Well then," said the writer to our Canadian would-be pioneer, "if the lower provinces will do nothing for you, and especially Quebec, your own, your native province, while upper Canadians have generously promised you to do their share, and Laurier to give you $60,000 towards the voyage when you shall have raised an equal sum elsewhere, then fall back on Ziegler, and if we cannot have the whole glory of the enterprise, and a half loaf is better than no bread, both nations will have contributed in