



12TH MARCH, 1914.

ADDRESS BY THE PRESIDENT.

MR. WALTER REEKS.

It has been said that the only difference between work and play is, that for the one you get paid, and for the other you don't.

I think we may reasonably argue that duty and pleasure are on the same plane as work and play; and if we admit that, then it follows that my presence here to-night, and this address, can only be regarded by me as a privilege and a pleasure, and my best thanks are due to you, gentlemen, for placing me in a position so to accord those thanks.

Already I begin to appreciate the privileges a President enjoys in reading an Address, as compared with the member who reads a paper, for at this moment I can almost feel some of the Past Presidents thinking that my opening statement is entirely incorrect, and that if this were a paper, I feel sure I should see notes being made to fire it back at me in the course of discussion; they would, perhaps, be inclined to just the opposite opinion, and say that the preparation of an address was hard work, and that it can scarcely be work and play at the same time. Well, rather than argue the point, I will admit that, in the words of the old Grace at Meat, "For what we are about to receive, the Lord knows we have worked hard enough."

It is customary to briefly review the past session, and in so doing I must with deep regret refer to our loss by death of one whose name has been closely associated with the rise and welfare of this Institution. I mean Mr. W. D. Cruickshank, who, in addition to having been one of the earliest members, was held in such esteem by his fellow-members that he was elected President on no less than five different occasions.

Another member, Mr. J. B. Scott, who was one of the Founders, also passed from us, and his loss we deeply deplore.

We now number 245 members, an increase of 7 during the last session.

During the session six papers were read, besides the President's Address. All were of high merit, and great interest.

By the courtesy of Professor Barraclough, members were afforded the opportunity of visiting the Engineering Laboratory and Workshops of the University, which was well attended, and a most instructive evening spent.

At the invitation of Mr. Bates, a member, a large number of the members and friends paid a second visit to Burrinjuck Reservoir Dam, which, thanks to Mr. L. A. B. Wade, Mr. Dare, and the Contractors, proved successful in every way.

The annual dinner attracted a large attendance of members and guests.

Your Council have decided to apply the interest accruing from the P. N. Russell bequest to the enlargement of the Library and proper housing of the books.

The Students' Section has, I regret to say, not quite satisfied the more enthusiastic of that body; but efforts on their part and on the part of a sub-committee of the Council, who are hard at work now to make that condition otherwise, will, I feel sure, result in success.

The Presidents' Addresses for many years past have been from gentlemen of broad general knowledge of the Engineering aspect, not only of our local surroundings, but of the operations of what, to us mortals, is a vast place—the world.

I shall confine myself to one branch of engineering, viz., "Shipbuilding," and in doing so, endeavour to shew that shipbuilding is not the single trade people are apt

to think it, but that, on the contrary, modern shipbuilding is just as much dependent on other branches of engineering as other branches of engineering are on it. I am not hoping to tell you anything you do not know already, but if I succeed in putting familiar things in a new light, I shall be content. Take the shipbuilders' dependence on other trades first, and while on the subject of trades, let it be understood that, for our purposes, the word "trade" will be used as representing a branch of engineering, and I think quite legitimately, for even more general purposes than our immediate notions, because while the designing and consulting, and civil engineers' work is of first importance, it is, after all is said and done, the text to the sermon, the brain of the body, or what you will; for has it not been agreed that the heart may conceive, and the head devise in vain, if the hand be not prompt to execute the design? Some of us here are, as we say, "In the trade," some of us are consulting men, some of us design only, and some of us do some of all those things, consequently scarcely two of us take precisely the same view of the things and doings round about us.

As an example of that, on one occasion I was chatting with a friend who sold machines of kinds to his very considerable financial benefit, and discussing some matters of recent improvement, I said, "Yes, old man, but you must pay for brains," he said. "Whose brains?" I said. "Why, the man who invents and perfects the improvement, of course." "Oh," he said, "those are cheap; I thought you meant those of the salesman." So, one sees, that the point of view taken makes all the difference, and if one could only see, as "God of All," to quote a line from Pope, one would probably be brought to a better understanding of the true relation of things, each to each.

Now there was a time when the production of a vessel involved quite a moderate number of trades, so much so, that it was looked upon as just a trade. I speak of the time when 1000 tons was a big ship; that is not so very long ago, and certainly within the recollection of men still alive. The first 1000-ton liner crossed the Atlantic in 1838.

Then the timber-getter took pride of place in importance, the shipwright was all essential, and, with his branch trades, the sparmaker, blockmaker, ship smiths, and ropemakers, practically produced the ship, the canvas looms, and, following them, the sailmaker, were important fellows; the ship joiner, upholsterer and painter, who finished her off, were, from the passengers' point of view, of course, quite the most important of the trades engaged on the work.

One must not forget, either, the copper miners, refiners and manufacturers of rod and sheet metal, nor can one quite shut one's eyes to the memory of those poor people who sacrificed their lives in the process of making white-lead.

Practically, therefore, one may say that, formerly, only about ten or a dozen trades were involved in the production of the then ocean-going vessel, including those incidental to the fitting out, but not specially enumerated above. (Figure No. 1).

I am quite aware that the present day condition of things has been a process of evolution, but as I have not the time, nor you the inclination, to follow that evolution in detail, let me turn to the state of things we find in 1914, and briefly review the ramifications of ship-building as it is now, and, confining myself more particularly to the engineering aspect of it, try to convince

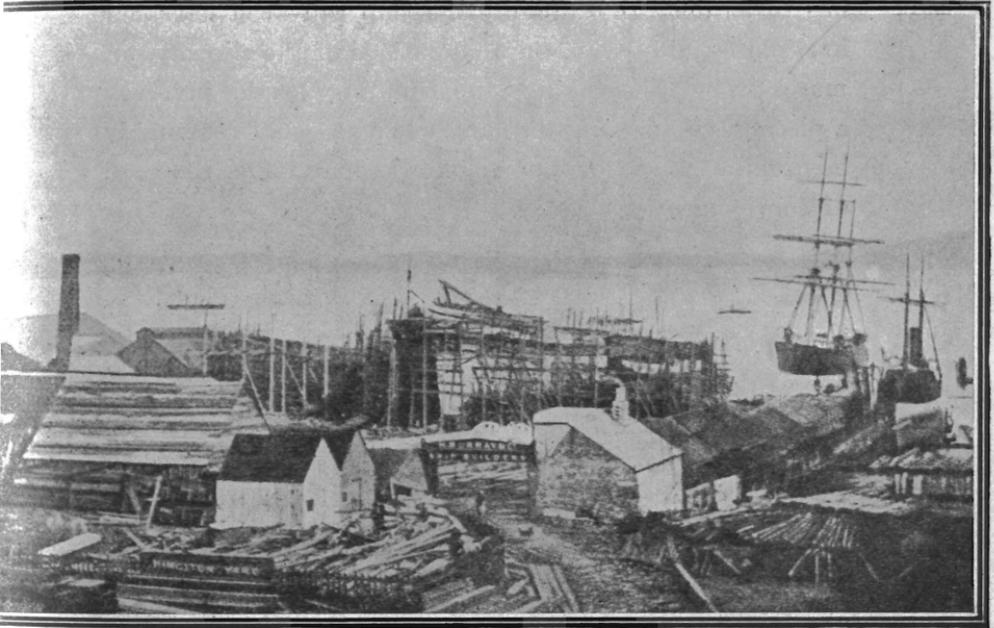


Fig. 1

you that the trade of modern shipbuilding involves the necessity of probably as wide a knowledge of engineering as any one can conceive of.

I do not suggest for a moment that any one man can know it all, but there must be one head, one leading light, one commander. Think first of the enormous quantity of material, and then how varied that material is, of the demand there is on iron mines, copper mines, tin mines, nickel, zinc, lead and coal mines, oil wells, natural and artificial gas, of the chemical laboratories, of the plants for mining the ores, of the mechanical conveyors, the enormous smelters and furnaces, and the horse, railway and motor traction, involved in the production of the first essential, viz., the principal material of ships' structure, and the specially trained men devoted to each.

Turn now a moment to the shipyard, and think what has to be done there before the ship can even have her keel plates laid—why, the foundations of the slipway, or, more properly speaking, the building berth, involves a piece of engineering that any one man could reasonably be proud of, and which particularly comes under the head of surveying.

It goes without saying, that the berth must be next the water, and the ground next the water is not always the best, and, being not of the best, has to be made good by one of the several methods, that is to say, filling, concreting, or piling, etc., or a combination of any two or all, for it is evident that, in the construction of a vessel of whatever size, the first consideration is to keep her fair and true on the blocks, and, in order to do that, the foundations on which the blocks are placed must be absolutely unyielding; and when one considers that the launching weight of one of the modern leviathans runs to over 24,000 tons, the importance of the question of this foundation becomes apparent, and the care and skill shown by those responsible a subject for admiration.

I may have a word to say further in regard to the launching of these huge bulks.

Next in order comes the means of protecting the plant used in the construction of the ship, and the men engaged on the job. There is less need, perhaps, to protect the steel used in the construction, because what is known as "weathering" is under proper control—a good thing as removing the mill scale or black oxide from the metal naturally, and time and money thereby saved; but protection there must be, and the picture before you gives a good idea of what a shed in a modern shipyard is like—

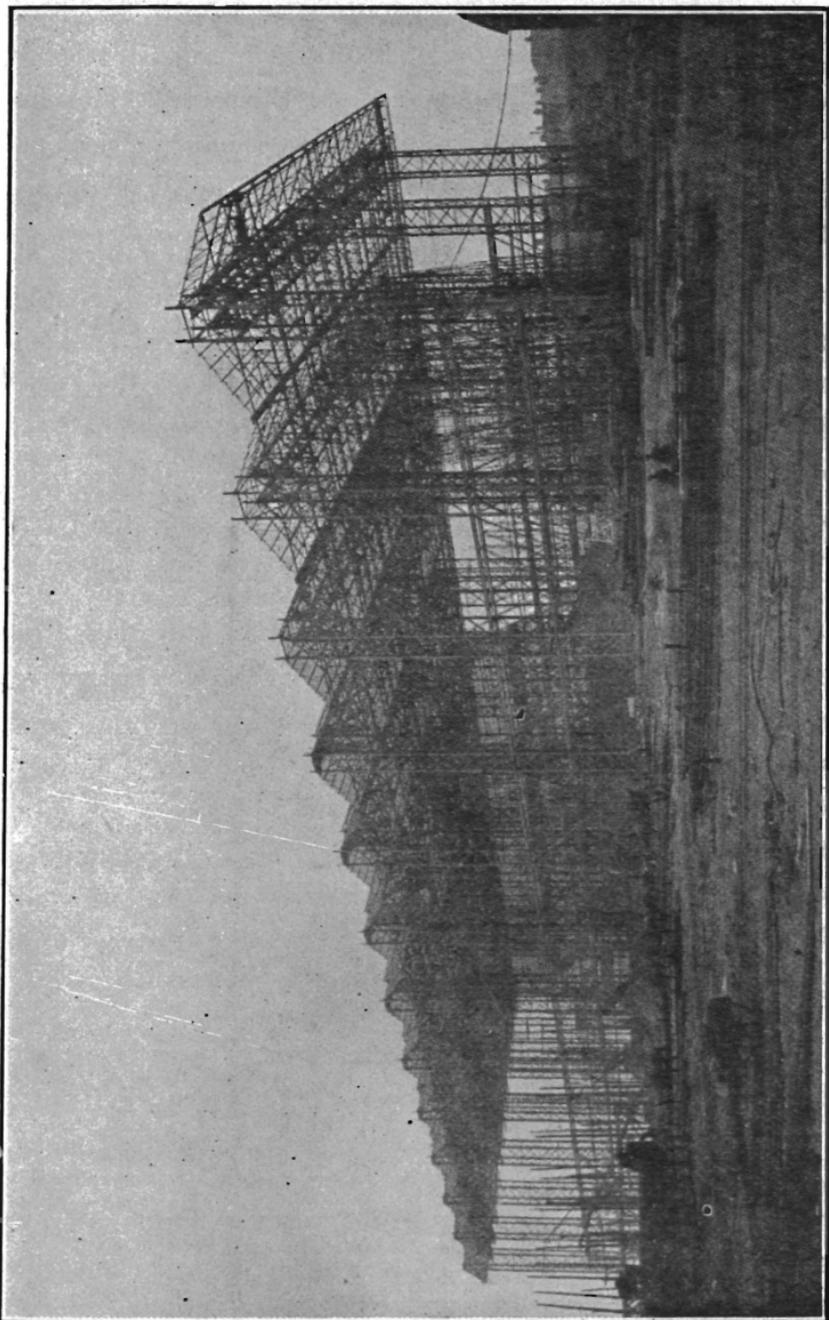


Fig. 2

the roofs are glass, 150 feet in height, with a clear width of about 100 feet, and run to 900 feet in length. The roof is supported on lattice work structures of such intricacy as to easily warrant a paper all to themselves, and involving skill and knowledge of this particular subject on even terms with the man who designs the finest bridges.

I would like to dwell at some length on the subject of this beautiful structure, delicate and symmetrical, simple and clean-cut, as the picture indicates, and yet of such strength and rigidity as to be capable of carrying, perhaps, eight or ten cranes, each from three to five tons capacity, and which are usually so arranged that for lifts of greater weight than stated they work in couples, for which, of course, the shed structure is adequate.

Light and airy as a lady's veil to all appearances, this shed can, and has, withstood the heaviest winter gales, snow, and frost, and absorbed the summer sunshine without the least apparent hurt; and without causing the least anxiety to those working beneath it, nor the insurance companies who hold the risk. There it stands, just doing its job, all unconscious that men so far away as the Antipodes are admiring its beauties and paying tribute to those who created it. (Figures 3, 4.)

Before dismissing the shed altogether, it may be noted that there are parts in the modern steel palace, very many times ten tons in weight, which must be lifted into place in one, and, to enable such lifts to be made, the overhead carriers have to be locally and temporarily supported by struts of upwards of 120 feet in length; also of beautiful girder pattern, and while apparently strong enough only to hold together, yet in point of fact are equal to all requirements. (Figure 5.)

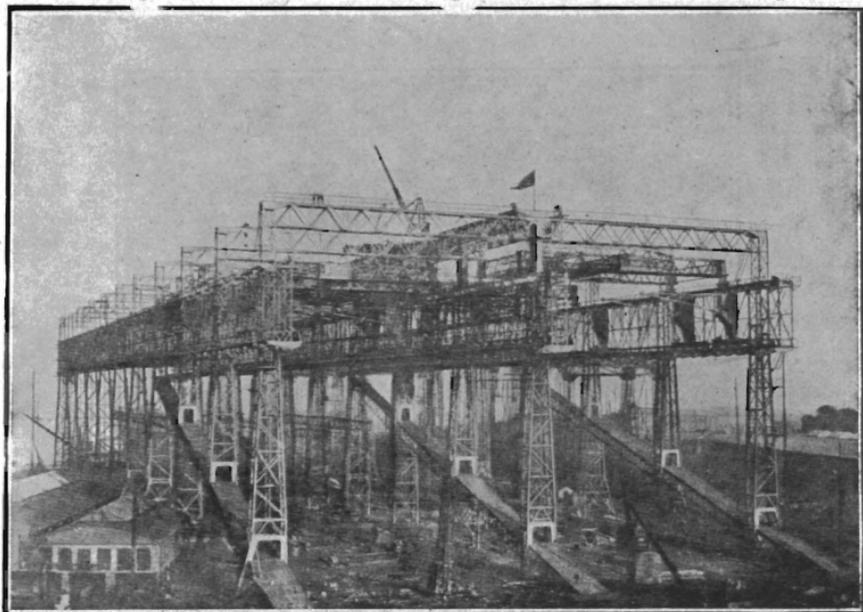


Fig. 3

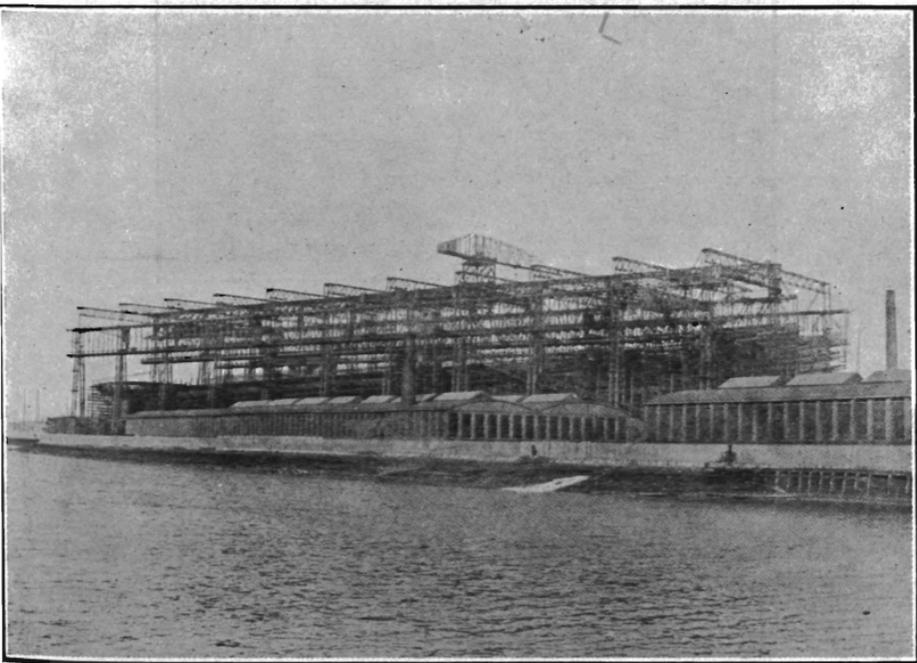


Fig. 4

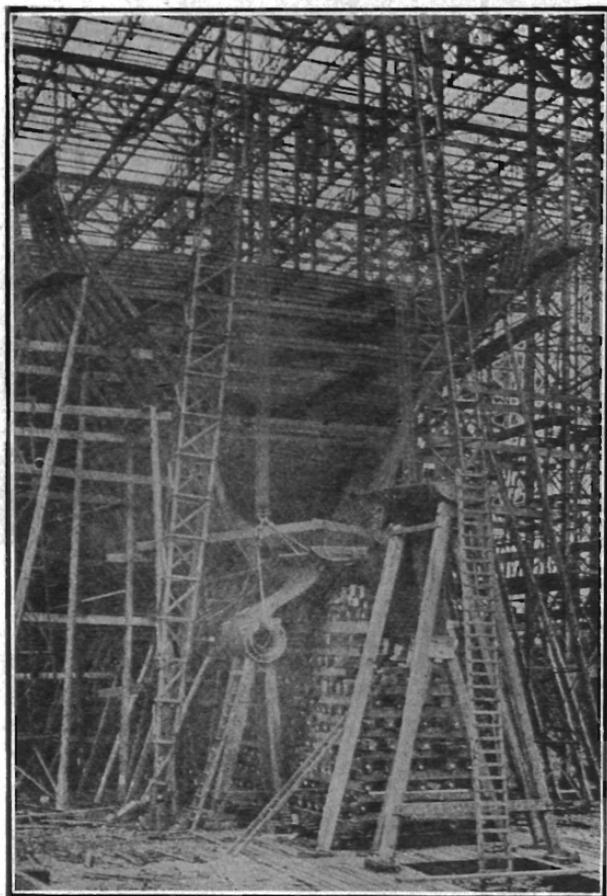


Fig. 5

An idea of these local lifts may be gained from the following figures of an actual ship recently built: Stern frame, 48 tons; after brackets, each $23\frac{1}{2}$ tons; forward bracket 24 tons; rudder, including stock and pintles, 64 tons. Nor are these extreme weights, for in some instance the stern frame is less subdivided than in the instance selected. (Figures 6 and 7.)

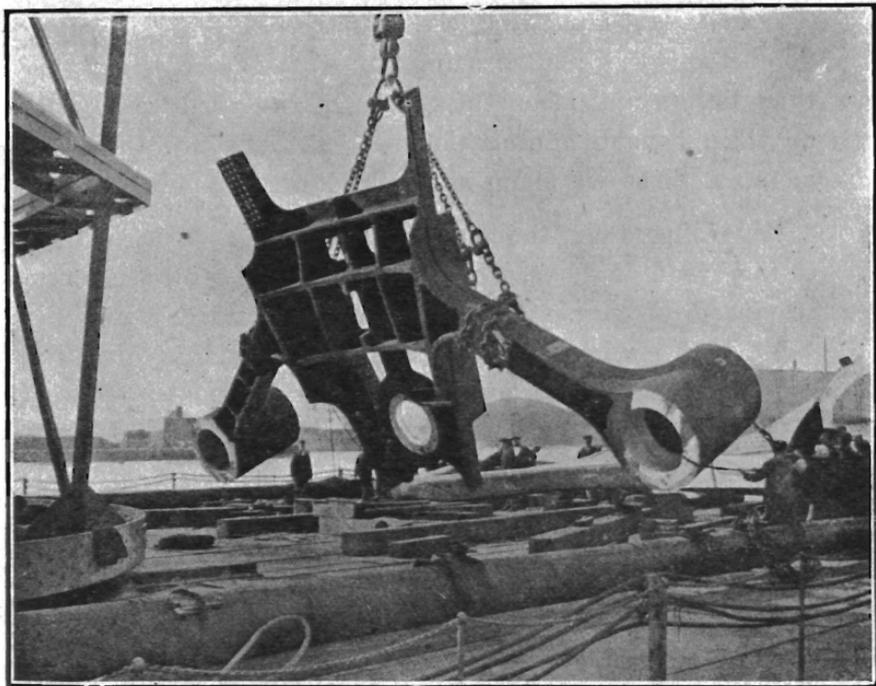


Fig. 6

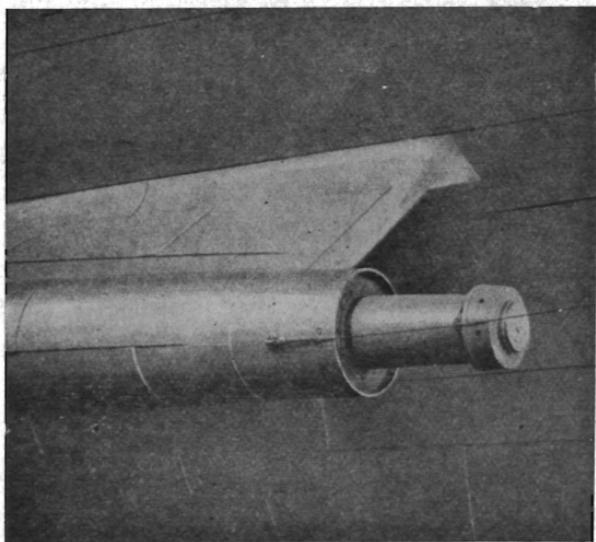


Fig. 7

Closely associated with the shed are the cranes, which do all the lifting and carrying, but as these are diverse in their design and means of operating, we need not dwell on them beyond adding the men who produce them as amongst those we claim as kindred.

Regarding, then, the shed as a sort of parent, we turn to the brood of shops, which are of necessity close about, so placed, of course, to reduce the time and cost of carriage to a minimum, and which are invariably directly connected to the surrounding railway systems.

In these sheds is the most up-to-date machinery for handling steel in the shape of plates, angles, bulbs, etc., of the largest size, and furnaces, almost all gas heated, are not infrequently 70 and 80 feet in length, in order to get uniform heats for such parts, while overhead cranes and travellers abound for moving such weights as these involve.

This branch of shipbuilding—the shipbuilding plant—constitutes quite a speciality, and adds one more to our list of scientific brethren.

One other branch of engineering comes prominently into this picture of the place where ships are built, viz., the hydraulic and pneumatic tools-man, together with his past experience of great tools with their enormous gaps reaching over and into the very vitals of the structure, till practically, nowadays, there is uniform riveting throughout the vessel, and to that uniformity is attached much importance by those responsible for her future good behaviour. (Figure 8.)

Having now put our shipyard in the condition of preparedness, and, what is very much more important, our friend the shipbuilder having in his office vaults a signed contract for a very large express passenger ship, it may be interesting to see how he sets about his work.

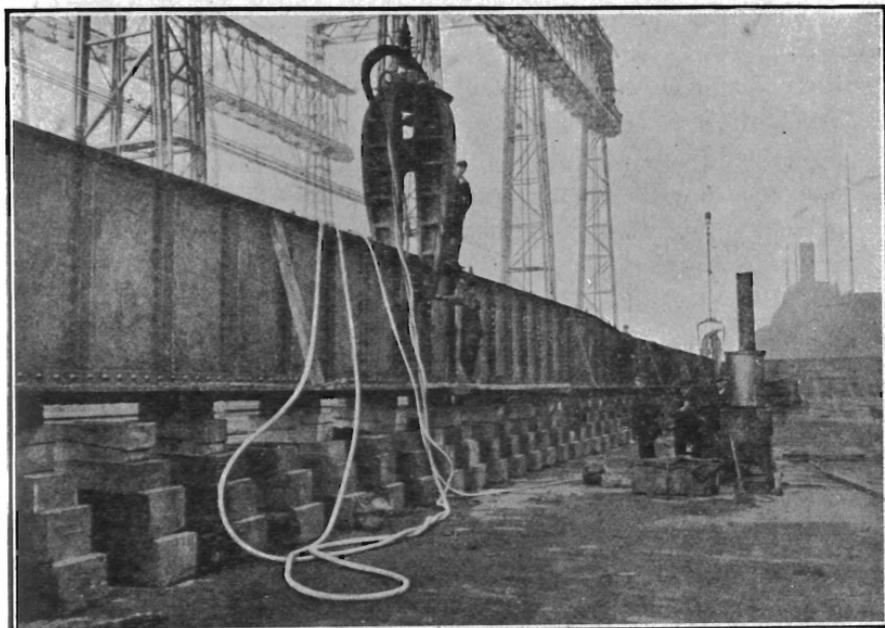


Fig. 8

Scarcely a liner of to-day, whose design is not subjected to its own individual computations, tank tests are carried out, and in many cases large size working model experiments, or, in other words, seldom is a modern liner a repeat of another. That rule is not infallible, of course, but the ship under review shall not be a repeat, anyhow.

Usually the company for whom a ship is to be built employ their own technical staff, in constant touch with their own superintendent engineers, ship superintendents, captains, and senior officers, pursers, chief stewards, and others, and from the personal observations of the leaders of that staff, who frequently travel in the ships for the very purpose of investigation with a view to future improved ships, prepare plans of a very full character, but, particularly as to their requirements of accommodation, this approximately fixes the dimensions, and the speed having also been determined, forms a basis of contract price.