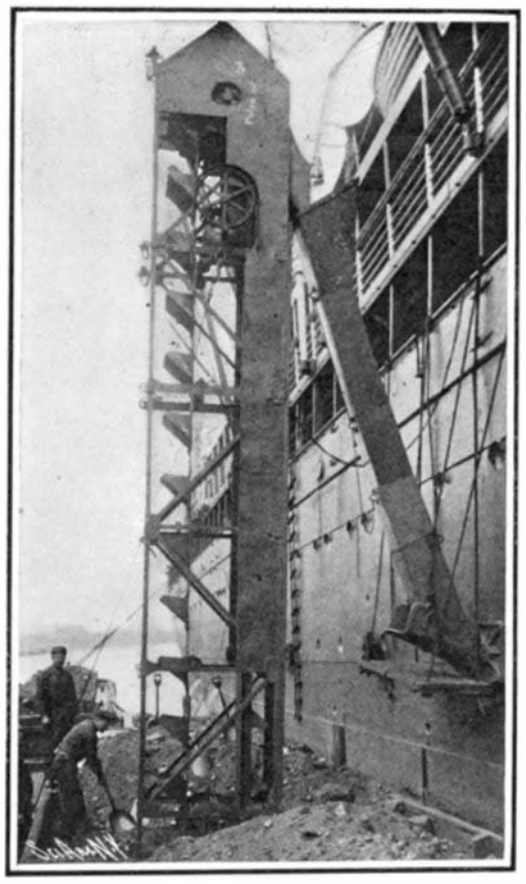
A NEW APPARATUS FOR COALING STEAMERS.

The problem of rapidly coaling steamships is one that has always presented many difficulties to those who have attempted to solve it. If we neglect the time element the difficulty of filling the bunkers of ocean liners is materially lessened, but as the conditions of modern commerce demand speed above all, it has been



Feeding the Coal into the Buckets.

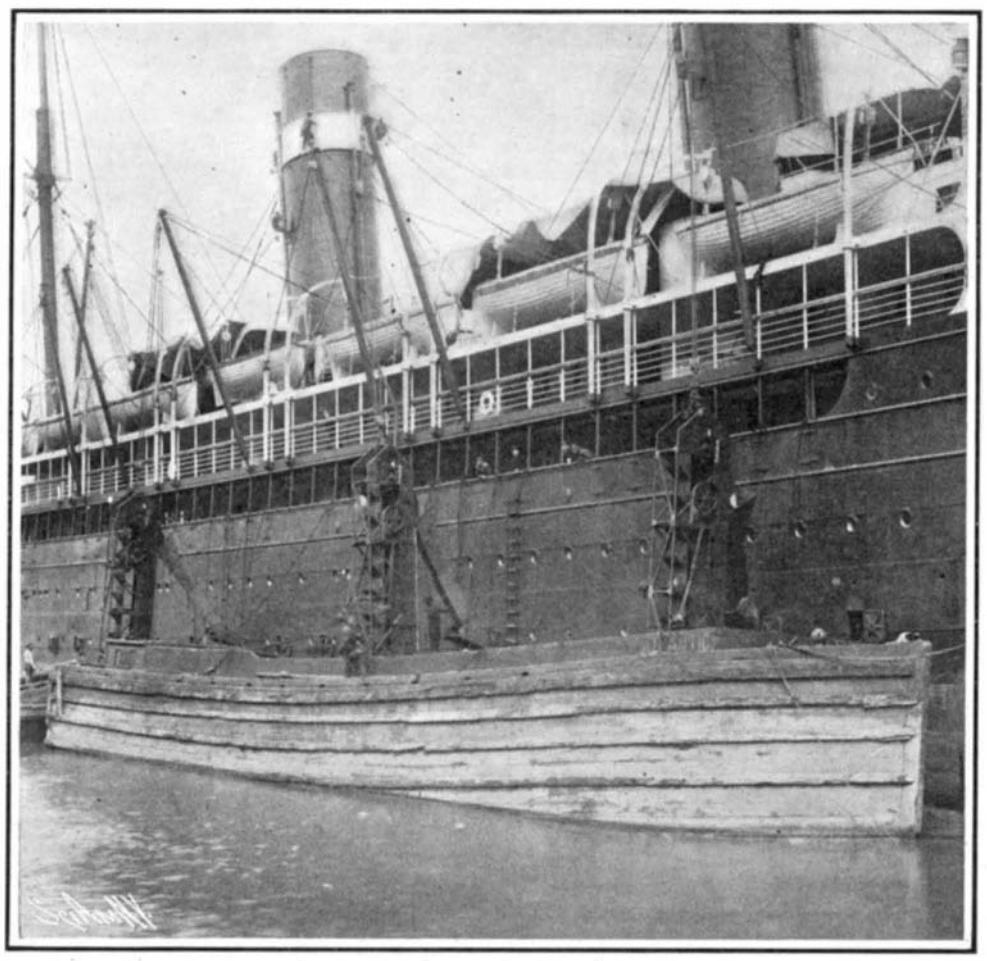
the aim of inventors for years to design a successful high-speed coaling apparatus. In crowded harbors such as that of New York, where every inch of water front and pier space is invaluable, there is the added condition that the space occupied by the mechanism must be a minimum. There are types of coaling machines in use at the present time which can easily handle a hundred tons per hour, but they possess, as a rule, the great disadvantage of being too large and cumbersome. Most of them, built directly upon barges, carry their own coal, usually about four hundred tons, and when this has been transferred to the vessel the entire floating apparatus must necessarily be removed before that particular machine can be used for further coaling operations. Moreover, the size of the apparatus is such that it cannot be placed between the ship and the pier, its height preventing its passing under the gangways.

Within the last year, a new coaling apparatus, the invention of Mr. L. A. de Mayo, has made its appearance, an apparatus which seems to fill the requirements which have been indicated. In this invention Mr. de Mayo appears to have solved many of the difficulties, general and local, encountered in this problem. One of the fundamental advantages of the de Mayo system is its simplicity, and, as the illustrations show, an explanation of the mechanism is almost unnecessary. After severe and repeated trials the American Line has adopted the apparatus and is using it regularly at its North River piers. Other steamship companies are negotiating for its use, and the navy departments of several governments have displayed keen interest in the invention. Our own government has ordered two machines which are to be thoroughly tested by the navy.

The machine consists of a comparatively light, steel frame tower. Within this is an endless articulated steel belt carrying buckets made of the same material. The belt runs over sprockets at each end of the frame. Near the upper end of the tower between the rising and descending chains of buckets is an electric motor which drives a large spur wheel. The upper belt sprocket is driven from the shaft of the large spur wheel by means of a chain. The supply current for the motor is taken from the dynamos on board the ship, and its speed is regulated by a portable automatic-release starting-box. The weight of the entire machine of the type in use at present is about two tons; its dimensions are approximately 31 x 3 x 3½ feet. It has twenty-nine buckets, each of which is designed to hold a cubic foot or about fifty-six pounds of coal. A crew of six men is required per machine. The apparatus can be suspended by means of ordinary tackle from either side of a ship, or from the pier. Its weight keeps its lower end below the level of the surrounding coal pile, gradually lowering as this is decreased. It can readily be moved in the barge or on the pier by four men. The narrow harbor barges with open loads, carrying about 400 tons of coal, are very well adapted for the use of the apparatus, and thus all available dock space is left free for the handling of cargo.

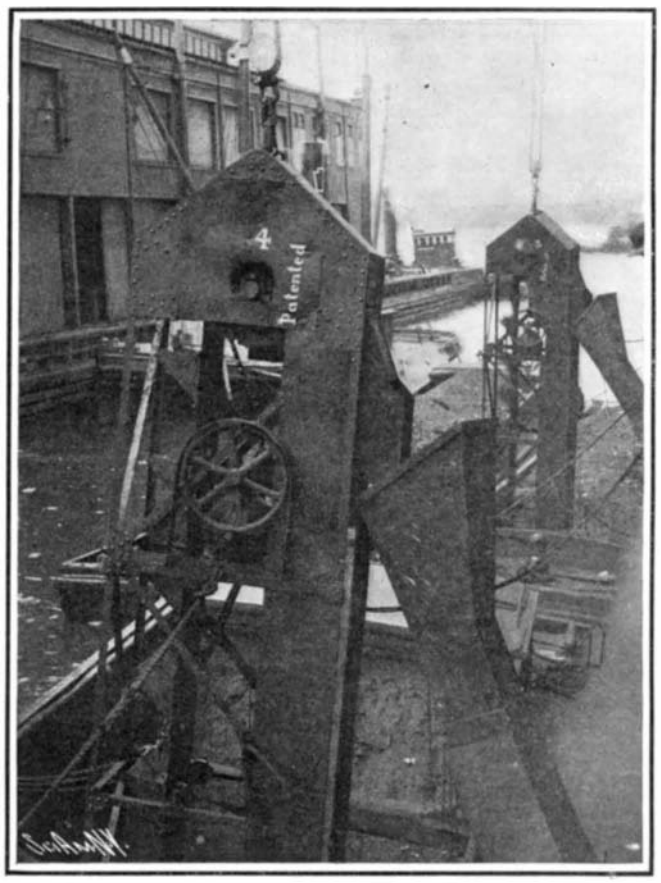
When run at its highest rate of speed, the apparatus can deliver a hundred and eighty tons of coal per hour. At this rate, however, there is great difficulty in economically feeding the coal, and the usual rate of delivery is about a hundred tons per hour. This rate includes a generous allowance for time lost in moving the machines from bunker port to bunker port, and shifting from one barge to another. As a rule, three or four of the machines are used on each side of the ship. In case of necessity eight machines on each side could be placed, and in this case a vessel of the size of the St. Louis or St. Paul could easily be coaled in ten hours. In the old manner of coaling with steam-hoist buckets, seven men could handle fifteen tons of coal per hour. The advantage of the new system over the old is too apparent to need comment.

With the old system just mentioned, large quantities of coal were lost, falling overboard either when the buckets were hoisted, or while they were being emptied. In the de Mayo apparatus, the coal travels from the barge to the bunker entirely within inclosed passages, for though the illustrations show the machines as partially open, they are ordinarily enveloped in tight canvas jackets, only the lower extremity, where the coal is shoveled into the buckets, remaining uncovered. A further great advantage arising from this is the almost perfect elimination of the coal dust. The officers in charge of vessels that have used this apparatus are very enthusiastic over this advantage of the de Mayo system, for the clouds of coal dust incident to the period of taking in coal in the old way sadly interfered with the spick-and-span appearance of the ship.



Three of the Machines in Use, Showing Method of Suspending Them from the Vessel.

THE DE MAYO APPARATUS FOR COALING STEAMSHIPS.



Upper End of Framework, Showing Driving Motor and Gear.

Peat as a Paper-Making Material.

About two years ago in Scotland and Ireland there was a revival of interest in the utilization of peat as a material for making paper, book board, etc. The failure of many previous undertakings, large and small, did not deter capitalists from investing in new plants, two of which have been operating for some time. The principal product is wrapping paper. It cannot be said that the industry is as yet much beyond the experimental stage, nor that any very important results are promised.

The difficulties that beset the earlier experimenters have not been wholly overcome and are still serious drawbacks to the economical use of peat. They are: (1) The troublesome and expensive process of getting rid of dirt, requiring a large amount of soda in the boiling vats; (2) lack of sufficient fiber in peat, necessitating the addition of other material, such as old gunny bags, ropes, hemp, etc., to make paper that will serve the ordinary purposes of grocers, dry goods merchants, and other tradesmen, my information being that little of the peat paper now put on the market is more than 75 per cent peat; and (3) the apparent impossibility of bleaching the peat pulp to a satisfactory extent, which means practically that only brown paper can be produced.

In view of these obstacles and of the low cost of manufacturing paper from straw and wood pulp, German straw paper selling in this market at $31 per ton of 2,240 pounds, it is not a cause for surprise that the progress of the peat-paper industry has been slow. One merit claimed for peat paper may lead to its extensive use for certain purposes—the manufacturers say that it will not harbor moths.—Rufus Fleming, Consul.

Wherever you find machinery, there it is necessary to reckon with friction; it is a great dissipator of energy, and heat is produced. To the uninitiated the slight modifications in an alloy do not seem of enough importance to be noticed. Those who have made a careful study of alloys find that just this feature may work direful results. M. Bischoff states that he can detect the deteriorating effect of one part tin upon ten million parts of pure zinc. Mr. Thurston found half of a per cent of lead to reduce the strength of a good bronze nearly one-half, and to affect its ductility to an almost equal extent. The success of an anti-friction alloy depends largely upon the combination in suitable proportion of the metals, producing a well-balanced alloy. An anti-friction metal, which has proved an unqualified success and stood the most crucial tests in actual service, is worthy of careful study. One of the more recent of these alloys is called cosmos, and has proved to possess certain extraordinary qualities. This alloy not only reduces friction and lubrication, but it sustains, within reasonable limits, great pressure without undue abrasion or compression.