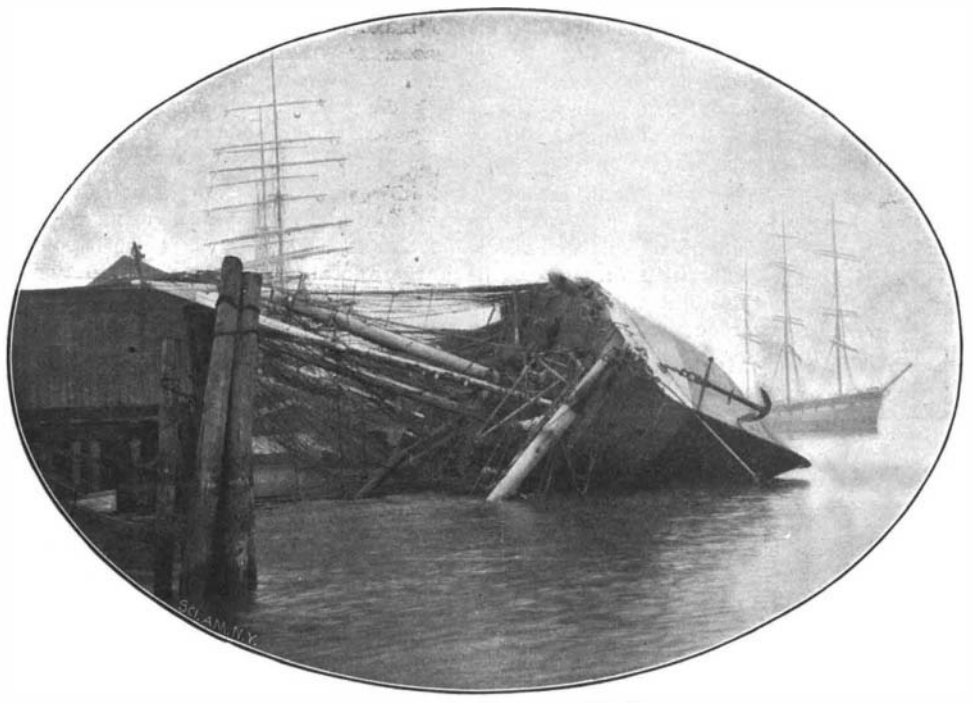
CAPSIZING OF THE FRENCH BARK "ASIE"

BY L. C. SCHAFER.

It is not an uncommon accident in the unloading of modern cargo vessels, whether steam or sailing, for the margin of stability to be brought down to the vanishing point, with the result that the ship capsizes. The best modern practice seeks to construct all vessels with such a metacentric height that the ship may be unloaded until she is absolutely empty without any danger of her capsizing. As a matter of fact, however, a large proportion of the vessels afloat require water ballast or solid ballast at all times, and, in unloading, care has to be taken not to render the vessel too light.

The French bark "Asie," which is herewith pictured in a pretty badly wrecked condition, was supposed to have been constructed to stand without ballast; but on the last day of the year 1901, while she was moored at her dock at Portland, Ore., she started careening, and before anything could be done to save her, turned over on her broadside and assumed the position shown in the photograph. At the time of the disaster there were thirty-seven men in the hold, unloading the sand ballast. The crew of twenty-two men and three subordinate officers gained the dock uninjured. Of the eleven stevedores employed on the boat, ten escaped without injury, and one was caught under the sliding ballast.

As the bark capsized the fore, main and mizzen masts struck the dock alongside of which she was moored, and were each broken in several places. The foremast was broken in three different places, the mainmast and mizzenmast in two places. All the yards were either torn loose or smashed, and only the jigger mast escaped. The bowsprit was also unshipped and thrown over to starboard, in the position shown in our engraving. The "Asie," is estimated to have sustained about $30,000 damage. She is a craft of 2,059 tons register, and is a sister ship to the "Europe." In righting the vessel the hull was secured to the dock, and the masts and gear were cut away, when the vessel immediately righted. It will take about four months to put the vessel in shape for the homeward voyage.



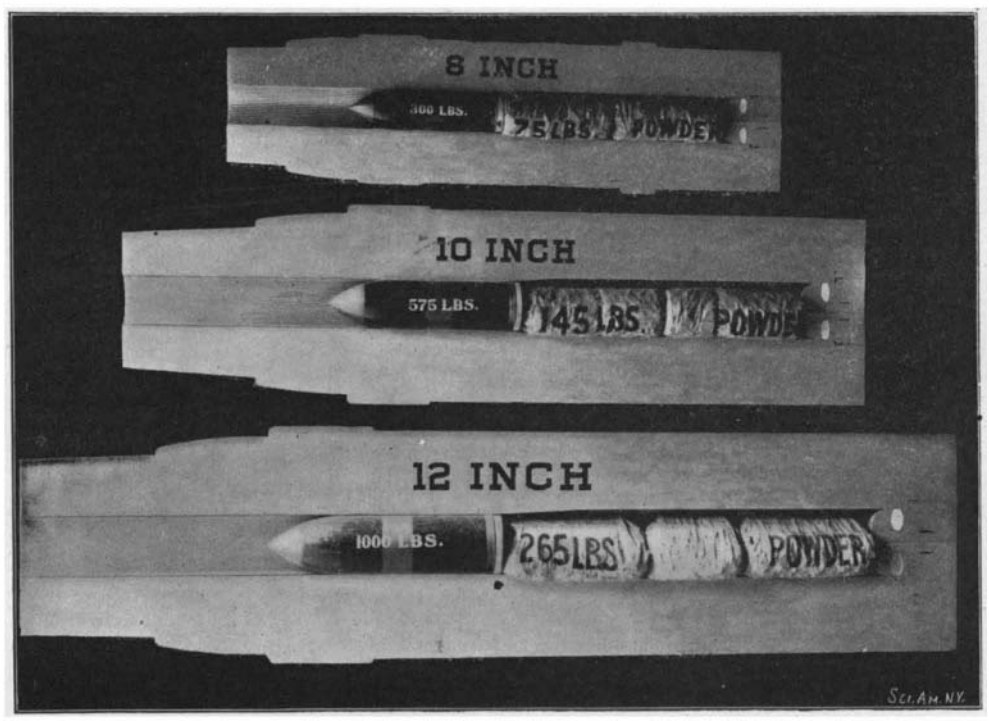
THE CAPSIZED BARK "ASIE."

AN OBJECT LESSON IN HEAVY ORDNANCE.

At the very completely-equipped Armory of the Thirteenth Regiment in Brooklyn, in addition to three full-sized models (and working models at that) of heavy seacoast artillery, there is a stand of three large, full-sized model sections of the principal seacoast guns, namely, 8-inch, 10-inch and 12-inch. The models are built of wood, and they are carefully lined and painted, so as to represent the appearance of sections cut from actual built-up steel guns. They represent the breech half of the gun, from a few feet forward of the trunnion ring to the breech. They are represented with the breech-block closed and locked. The breech-plug is an exact model, and shows the mushroom head and the obturating material which serves, under the pressure of the powder, to completely seal the breech and prevent the rearward escape of gases. The powder chamber of each section is filled with bags, of the exact size and appearance of the actual powder bags, the sticks of smokeless powder being here replaced by short lengths of round wood, ordinary broomsticks, in the case o. the larger guns, being cut up into lengths to serve the purpose.

The 8-inch gun fires a 300-pound shell with a charge of 75 pounds of smokeless powder, which, for the convenience of handling, is put up in two bags. The 10-inch gun fires a 575-pound shell with 145 pounds of powder, which is also put up in two bags. The shell for the 12-inch gun weighs 1,000 pounds, and the charge of 265 pounds of powder is put up in three separate bags. It will be noticed that the powder chamber is larger in diameter than the bore of the gun. Thus, the 8-inch gun has a diameter of 9.5 inches in the powder chamber, the 10-inch gun has a diameter of 11.8 inches, while the powder chamber of the 12-inch gun is 2½ inches larger in diameter than the bore.

In loading the gun the breech-block is unscrewed and swung clear of the body; the shell is then introduced into the powder chamber and thrust sharply forward until it brings up with its rotating band of copper jamming tightly into the commencement of the rifling; that is, into the spiral grooves which extend through the bore of the gun and serve to give a twist to the projectile. The band is of somewhat larger diameter than the lands of the gun, and when the explosion of the powder takes place, the metal of the copper band enters the grooves, fills them entirely, and thus serves to prevent the escape of gases past the base of the shell. The rifling band consequently acts the double part of a gas check and a means of imparting the rotation. At the instant of firing the initial pressure in the power chamber rises to 16 or 17 tons per square inch. As the shell moves down the bore, the powder pressure gradually falls; but it does not fall so rapidly as it did in the days of the old black powder, for the reason that the smokeless powder is what is known as "slow-burning," and keeps on giving off fresh gases to fill the increasing space behind the shell, thereby maintaining a higher average pressure on the base of the projectile and securing a higher velocity of the shell at the muzzle.



AN OBJECT LESSON IN HEAVY ORDNANCE.
Models of heavy coast-defense guns at the 13th Regiment Armory, Brooklyn.

Firing Large Power Plants.

There are four power plants in New York city today whose engine capacity when completed will aggregate 400,000 horse power. These are unquestionably the largest central stations in the world, and they contain the latest improvements in machinery and methods for generating and distributing power by electricity. Not the least interesting feature in these stations is the elaborate plant which has been installed for firing the boilers, bringing the coal to the furnaces and removing the ashes. The question suggests many interesting conditions. Imagine the Manhattan plant, for instance, receiving its coal in trucks, run into the station in the old way, and dumped in front of the fire grates, and the ashes hauled away in railway trucks or push carts. That is the way this work was formerly done. The boiler room would have to be three or four times as large as at present, and a stoker brigade of several hundred men would be required for hand-firing; besides the labor and the dirt and confusion arising from loading the coal and ashes would be an important factor. By coal-handling and conveying machinery and mechanical stokers in these large plants, however, the problem is simplified; the work is done by a comparatively small force, the boiler room is entirely free from coal, ashes, dirt and smoke, better results are obtained, more perfect combustion is secured, and the smoke which is due to improper firing is entirely eliminated.

In the large power houses mentioned, the mechanical equipments for handling fuel, feeding the fires, and removing the ashes have been developed to the highest point of efficiency known to modern engineering. For the Manhattan plant, now in course of construction, the coal is delivered in barges at the dock, and unloaded into bunkers above the boilers at the rate of 150 tons per hour, by means of a tower equipment with a 1½-ton shovel, crushers and weighing hoppers, and a bucket conveyor. Perhaps the most interesting feature of the problem is the provision that has been made for feeding the fires. Coal is brought from the great storage bunker under the roof, which has a capacity of 15,000 tons, to hoppers at the front of the boilers by means of chutes, and is then fed at a previously determined rate to the inclined grates by means of automatic machinery known as the Roney mechanical stoker. It was estimated by the engineers for the Manhattan Company that at least 270 men would be required to fire their boilers by hand, whereas with the stokers a saving in labor alone can be effected of over $400 per day. Another important advantage gained by adoption of this stoker is the fact that it will permit the use of hard or soft coal, either separately or mixed. For this no alteration is required in the arrangement or construction of the stokers, merely a different adjustment of the feed and grate-actuating mechanism. The supply of coal fed to the furnace is regulated by the feed wheel, and the motion of the grate bars is adjusted by the position of the lock nuts, and these adjustments are easily made by any fireman. Practically the same form of equipment has been adopted for all the large power stations that have been undertaken in New York of late years, and one of the greatest advantages, aside from economy and efficiency, is that enjoyed by the public in the elimination of the smoke nuisance. This is brought about by the fact that mechanical stoking, by providing first a sufficient air supply for the combustion of the volatile gases, secondly a constant high temperature, and thirdly a uniform supply of fuel, regulated as required, presents conditions closely resembling those in a large Argand burner. This is true both of the ease with which the fuel and air supply are regulated, and in the smokeless combustion of the hydrocarbons of the coal.

It is proposed to introduce these devices at the St. Louis World's Fair, and this will work an important advancement in standard steam plant practice over that of the Chicago Fair—probably one of the most important power station developments in the ten years intervening. It will be remembered that the Chicago World's Fair plant depended upon oil fuel, as the objections to the dirt and smoke and ashes from a power plant using coal were considered unsurmountable.

Gift to Harvard.

From a friend of Prof. Pickering Harvard College has received a gift of $20,000 for the benefit of the college observatory. The very urgent need of the observatory will be at once relieved by this gift. The building provided nine years ago for astronomical photographs has become inadequate. Prof. Pickering intends to expend about half of the fund in extending the present building, in order to provide for the storing of the collection. The photographs furnish a history of the entire stellar universe for the last twelve years, and cannot be duplicated in any other observatory. They are of immense value in studying the past history of any part of the sky. The remainder of the fund will be expended as the needs of the observatory may demand.