

inches thick at the bottom. Above this will be a wall of armor extending from abreast of turret No. 1 to abreast of turret No. 3, which will be about 15 feet in height and will vary in thickness from 10 inches at its bottom edge to 8 inches at its top edge, which will be flush with the main deck. Behind the protection of this wall of armor will be the greater part of the 5-inch gun battery. The barbets and turrets for the 12-inch guns will carry armor of from 10 to 11 inches in thickness. A considerable amount of the displacement of these ships will be devoted to rendering them more stable when they have been struck at or below the waterline by shell or torpedo. This protection will consist of longitudinal and transverse bulkheads of extra stiffness and strength, in the riveting of which particular care will be taken to secure joints that will hold water, even under the heavy stress of flooded compartments. This work is of a character that does not make a spectacular showing, or convey the impression of fighting strength that is due to the guns, turrets, and other visible portions of the ship above the waterline; but it is of vital importance for the all-round efficiency of a battleship. In this respect our new ships, and our "Dreadnoughts" in general, are believed to be superior to contemporary foreign ships of the same type.

To drive this 26,000-ton mass at 21 knots calls for a considerable increase of engine power. The ships will be driven by turbines, either of the Curtis or Parsons type. If of the latter type, they will have four screws; if of the former, two screws. Before the question of type of engines is decided, however, the full data of the competitive trials of Parsons, Curtis, and reciprocating engines on our scout cruisers will be available, and we think it is more than likely that the Curtis type will be found to have sufficient points of superiority to warrant its adoption in the new ships. The total contract horse-power will probably be about 33,000. This, if Curtis turbines are used, will call for the development of between 16,000 and 17,000 horse-power on each shaft—an amount that has already been exceeded on each of the four shafts of the Cunard liner "Mauretania," which, however, is driven by Parsons turbines. The contract speed will be 21 knots, and it is probable that the bunker capacity will be sufficient, with full stowage, for 3,000 tons of coal.

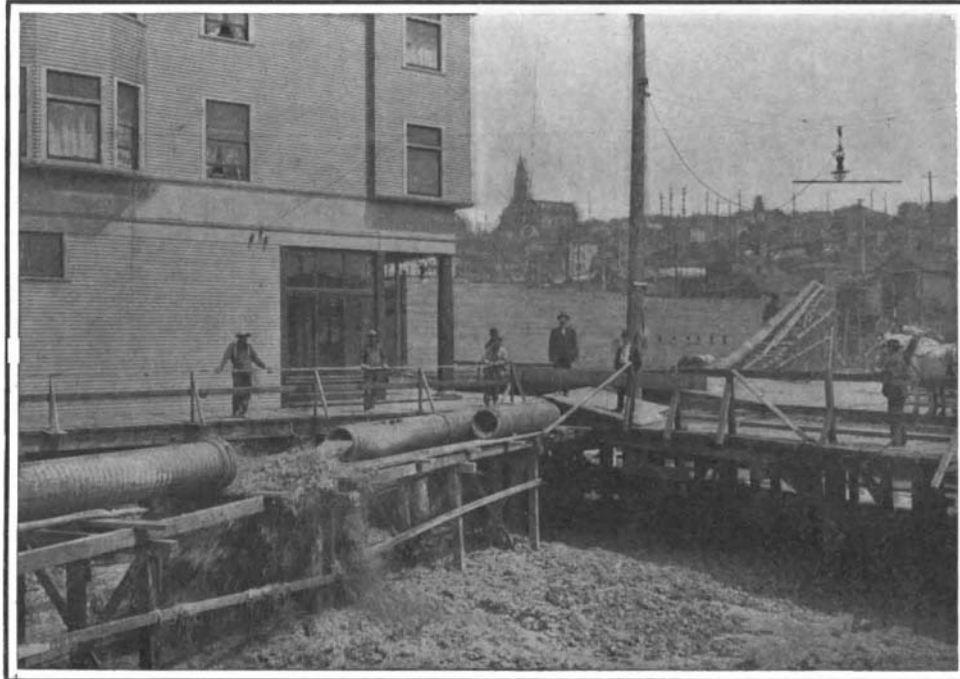
The above description and the accompanying illustrations of the ships approximate closely to the plans in their present state of completion. The main features will be as shown and described, though minor

REGRAIDING A CITY BY MEANS OF HYDRAULIC SLUICING.

BY J. MAYNE BALTIMORE.

The city of Seattle, Wash., which has quadrupled its population in much less than two decades, has found its growth badly hampered by the succession of hills rising from the water level of the Puget Sound, over which the city has been forced to expand.

At an expense of more than three million dollars, the hills are being washed into the fills; the tide



One of the sluice pipes delivering mud on the tide flats.

flats are being filled level, for business and manufacturing purposes, and steep grades are being reduced to smooth the way for commerce and to encourage the growth of manufacturing and other lines of business. To do this work it has been found necessary to "make over" a large section of the city already built. Hundreds of houses have had to be moved out of the way of the work of regrading. In addition churches, schoolhouses, and business structures have been remodeled or torn down. Paved streets, water mains, and sewers, have also been dug up to be replaced with better ones, when the work of regrading has entirely been completed. The work accomplished and in progress covers 374 blocks located in the very heart of Seattle, while the work thus far completed covers 239 blocks.

In one place the level of Third Avenue, one of Seattle's principal streets, is being lowered 107 feet, and several blocks in the Jackson Street regraded district which extends to the Seattle tide flats have

carried away through flumes and big pipes to the fills and the tide flats some distance off—often many blocks from where the hydraulicking is in progress.

The method is simply the application of hydraulic mining methods to excavating, on a very large scale. Streams of water are forced through great mains from a central pumping plant, and are directed against the hills through "giant" nozzles, and the clay and dirt crumble and melt away before these streams like snow under a warm rain.

It frequently happens that the main lines of cable and electric cars have been blocked for a day or two by some house on its way to a new location; and in many sections of the city where the grade of streets has been lowered 30 or 40 feet without lowering adjacent property, residents have been compelled to reach their front doors with long ladders, until flights of steps have been constructed.

So rapidly have the contractors been crowding forward this regrading piece of engineering work, that they expect to have it all completed within a period of three or four months.

Transferring Proofs to Celluloid.

For making slides for lantern projection, or where for any reason it is desired to transfer to a flat celluloid surface a printed proof—such, for instance, as an illustration from a book, magazine, or newspaper—a process recently made public in Germany is very simple and effective. The surface to which the proof is to be transferred is rubbed gently for about

two minutes with a rag or a ball of cotton wool dipped in alcohol. For this purpose the ordinary "denatured" alcohol, if colorless, is just as good as the pure, and much cheaper. The proof to be transferred is then promptly laid face downward on the plate, and pressed firmly thereon for about fifteen seconds—for instance in a copying press—several thicknesses of paper being put below the celluloid and over the proof, to equalize the pressure. The result is that all the lines of the engraving are transferred, naturally left-handed, to the softened surface of the celluloid. The paper must be withdrawn before the celluloid hardens.

Should, however, the softened surface harden too quickly, the paper may be removed by rubbing with a wet sponge; the impression of the picture will not be injured. Fresh proofs transfer more readily than old ones; but even the oldest printed lines will leave the paper and adhere to the partly dissolved celluloid.

It is reported that some time ago Mr. Louis Brennan



Washing down a hill by means of "giant" hydraulic jets. The mud is carried down to the tide flats.

REGRAIDING A CITY BY MEANS OF HYDRAULIC SLUICING.

alterations may be made before the final contracts for the two vessels are placed.

In educating users in the proper care of a storage battery, there is still a great deal of work to be done. The majority of automobiles are cared for in garages, not always to their benefit. The owner of an electric car usually does not attempt to care for his own machine and do his own charging until he has familiarized himself with the work. Moreover, he is dealing with his own property, and therefore naturally gives it special attention.

been filled to a depth of 46 feet, and more. So far over ten million cubic yards have been removed out of the total of 13,586,977 cubic yards involved in this entire colossal piece of engineering.

The work has progressed very rapidly. At first giant steam shovels were used; but later a new method of excavating was adopted, namely, the substitution of hydraulic jets for steam shovels. This is the first time that hydraulic methods have ever been used on the Pacific Coast for street grading purposes. So powerful are these jets that they quickly tear down the hills. The vast masses of disintegrated earth are

made an offer of his monorail to the Australian Commonwealth, and the late government was considering the proposal at the time of its going out of office. The terms of the offer were that in consideration of the Commonwealth providing \$57,500 for the construction of the first full-sized car, and to enable the inventor to perfect his invention, the Commonwealth government should have the sole right for Australia to manufacture other cars on payment of a royalty of 5 per cent on the cost price of all cars built within ten years after delivery of the first car ordered by the Commonwealth.