

## Correspondence.

## THE STEAMSHIP "REPUBLIC."

To the Editor of the SCIENTIFIC AMERICAN:

Your editorial entitled "Lessons of the Republic Disaster," in the SCIENTIFIC AMERICAN of February 6th, is misleading in certain respects, if the facts as I have learned them are correct. With reference to the building of this ship, you state "had she been built for a company that was hampered by a shortage of funds," etc. This, with what you say further, would imply that she was built for the famous and substantial White Star Line Company, who have a system of contracts peculiarly favorable to first-class construction. I have been informed with positive assurance that this ship was built for the Leyland Line as a freight and cattle steamer, and before completion, on account of finances, she was taken over by the Dominion Line for Boston service, and before being put in commission was again transferred to the White Star Line Company, her name being changed from "Columbus" to "Republic." I have been informed that the "Republic" was not a first-class ship, and could not be compared with the other boats of the White Star Line. If this is true, it seems to me your editorial hardly does credit to the White Star Line, since it reduces their other boats to the level of the "Republic." O. A. WEISS.

Minneapolis, Minn.

## END VERSUS CENTER DOORS FOR EXIT ON SUBWAY CARS

To the Editor of the SCIENTIFIC AMERICAN:

The articles in the daily papers together with a personal experience leads me to say a few words concerning the question of "side doors" in the New York Subway. The problem of loading and unloading passengers with ease and speed is a great one, and before any plan is adopted and with great expense installed, all should be given a fair test. In my opinion, the plan now being tested is faulty in principle and not conducive to the best results.

My idea is essentially this: To put two wide doors for the purpose of exit, in the middle of each car, one on each side, and to use the present doors for entrance. The plan now being tried requires four new doors, two at each end, also providing for separate means for entrance and exit.

With a car comfortably filled and nobody standing, little or no difficulty is met in loading or unloading passengers. Therefore the plan for separate entrance and exit will show its efficiency chiefly in crowded hours and under crowded conditions. It is, in other words, a rush-hour improvement.

When one enters a crowded car, the tendency is naturally to stop near the door—the standing is no different and it is easier to get out. This idea carried out by a few immediately causes congestion; and this is what I would emphasize—the new doors are practically at the ends of the car and will not eliminate this congestion or help it to any great extent. The two streams of people will still conflict, not at, but just inside of the door. What is the difference?

A door in the middle of the car is going to effectually solve this problem for the reason that as the crowd enters it will instinctively move toward the middle, or exit. A natural circulation will thus be established, the comers and goers will move without opposition and congestion will not arise at any one point. The saving of expense also, in installing two instead of four doors in each car, is manifestly evident, and if cost is considered, this point is strongly in its favor.

The two great disadvantages of the plan are, first, the distance between the door and the guard who operates it, with corresponding danger to the passengers, and second, the space that would occur between the door and platform when the station is located at a sharp curve. These two, however, are mere mechanical incidentals, easily solved, and should in no way interfere if the fundamentals are right, which I think they are.

I am hoping for your consideration of this matter and a comment through your columns will be appreciated, for I am sure that there are others who feel the same as I do in the matter. It is something for every strap-hanger to consider.

Brooklyn, N. Y.

H. B. FORMAN.

## SEAWORTHINESS OF PASSENGER STEAMSHIPS.

To the Editor of the SCIENTIFIC AMERICAN:

Regarding the letter of your correspondent bearing on the foundering of the steamship "Republic," permit me to say that as regards structural strength, or indeed, the general seaworthiness of large mail and passenger steamers, the specification of the owners does not make any material difference with good shipbuilders. It may sound strange, but I can assure you that there are certain shipbuilders who do not know how to construct a bad ship. I know several of such who never have built a bad ship. On the other hand there are builders who, apparently, do not know how to construct a good ship. I have known many of such who never have built a really good ship, and all the specifying and superintendence possible cannot bring forth a good ship from their works. I incline toward the opinion that the builders of the "Republic" never built a bad ship, i. e., as regards materials and workmanship. They built some vessels of faulty proportionate dimensions, but that was the fault of the times. They also made a mistake in designing the "Britannic" with a lowering screw shaft and a large open tunnel exposed to the sea, but they were almost warranted in adopting that novelty in ocean navigation, as the very same arrangement gave at least satisfactory results in their little steamship "Camel," 170 feet in length, which they built in 1870 to carry the boilers, etc., for the first "Oceanic" and "Republic" and others. This was a very instructive experiment and it proved conclusively that a mechanism which may work well on a small scale will not necessarily do good work and be safe on a very large scale. This mistake cost the builders \$300,000 before the "Britannic" and her machinery were restored to normal design.

The great value of a good specification is in securing good furnishings and fittings. The specifications for these, for the old P. & O. steamers frequently covered one hundred pages of close print. The owners in those days would not look at veneer; they demanded maple, mahogany, and such woods, all solid. However, there is one thing which I would like to see specified, that is, that all large ocean passenger steamers should be arranged with a large augmentation of bilge pumps, which, with their boilers, should be placed from 7 to 10 feet above the maximum load water line. It would also be a safeguard, as collisions must occur, to have a few large sheets of canvas reinforced with wire netting and loaded at one end with cast iron pipes to sink them over the fractured bow or side. These could be rolled up and placed in large hooks just below the boat deck. In these days without sails I think you could find many passenger steamers without sufficient strong canvas to check a large inrush of water. Tarpaulins on passenger steamers' hatches are not sufficiently large and it requires considerable time to get them in place.

Cleveland, Ohio.

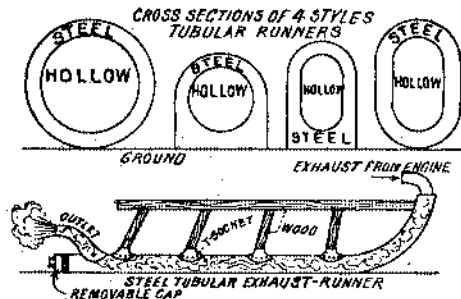
JOSEPH R. OLDHAM.

## DEFECTS IN MOTOR-SLEIGHS.

To the Editor of the SCIENTIFIC AMERICAN:

In reading the article on motor-sleighs in the SCIENTIFIC AMERICAN for February 27th, 1909, I saw that the main trouble with motor-sleighs is their sticking when standing still, so that it is hard to get them under way. To facilitate their getting under way, the runners can be warmed. It is to let the engine exhaust through tubular steel runners, at the will of the operator, who can switch the exhaust from the regular exhaust to the runners for starting and then switch it back to its original place, as soon as the sleigh is under way. As may be seen, the exhaust will warm the runners so they will not stick. To use this device on the Austrian Wells motor-sleigh: In starting, you would start the engine and switch the exhaust into the runners and start the propeller, behind the sleigh, going fast enough so that when the runners did not stick any more, the sleigh would glide ahead. This done, you would switch the exhaust to its original place.

To use this scheme on a belt driven or planetary transmission, you would switch the exhaust into the runners after starting the engine, and put on a little power, either letting the belt slip until the sleigh starts or not quite entirely throw in the planetary transmission clutch. The same would hold good on



SCHEME TO OVERCOME DIFFICULTY IN STARTING A MOTOR-SLEIGH.

a friction drive, for you could put on a little power and let the disk slip until the sleigh started. The whole operation is quite simple.

The back end of each runner has a cap which can be unscrewed to allow the runners to be cleaned inside. Near the back end of each runner a pipe branches upward and backward; this is the place the exhaust leaves, in order that snow will not clog the runner-pipe in backing.

The braces to the runners can be fastened to the runners by means of T sockets, which are fastened to the runners by welding, rivets, or screws.

The exhaust pipe from the engine can divide into two pipes, one for the regular exhaust, and the other divides into two pipes, each to a runner. A valve is to direct the exhaust through either the regular exhaust or through the runners.

Washington, Conn.

MEREDITH CLARK.

## The Current Supplement.

A novel system of automatic railway signaling is described and illustrated in the opening article of the current SUPPLEMENT, No. 1735. An authoritative life of Thomas A. Edison will shortly be published from the pens of Frank L. Dyer and T. Commerford Martin. From this life we abstract a chapter which sets forth in figures the commercial value of Edison's inventions. In an article entitled "Testing the Hardness of Metals," the various methods of testing hardness are reviewed at length. W. R. Turnbull writes on his original studies of the efficiency of the aerial propeller. Modern Experimental Biology is again discussed in an excellent article entitled "Artificial Mutations of Animals and Plants as the Basis of Technical Biology." K. Sajo writes on the sense of hearing in insects. "Silver Plating" is the title of a good technological article.

## A Chance for Rubber Heel Inventors.

The inventor of a well-known, widely-advertised rubber heel for shoes has expressed a desire to examine patents covering rubber heels, or even mere ideas. Inasmuch as many readers of this journal are inventors of rubber heels, it will give the Editor pleasure to place them in communication with this manufacturer. Inquirers should send in printed copies of their patents to be forwarded, if their ideas are patented.

## OUR NEW 26,000-TON BATTLESHIPS.

The recent decision of Congress authorizing the construction of two battleships of 26,000 tons displacement, assures to the United States navy the possession of the two largest battleships ever built; for 26,000 tons is about 5,000 tons greater than the displacement of any foreign battleship now under construction. The next in point of displacement are the latest "Dreadnoughts" of the Japanese navy, of about 21,000 tons, and the latest British "Dreadnought" of about 20,000 tons.

So that if there is any cause for congratulation in the fact of the possession of the biggest fighting ship in the world, we are entitled to no small amount of national self-felicitation. The time is approaching, however, when we may well begin to ask if we are not somewhat overdoing this question of size; whether, indeed, the total displacement of 52,000 tons represented in these two ships could not be divided up to better advantage in three "Dreadnoughts" of more moderate dimensions. But that is another story.

The two big ships will be a logical development of the "North Dakota" and her successor the "Florida," now building at the Brooklyn navy yard. The "Florida" will displace 22,000 tons, and a ship of her size does not require much increase in the individual dimensions to secure the additional 4,000 tons. The length over all is increased from 521 feet 6 inches, to 545 feet; the beam from 88 feet 2 1/4 inches to 92 feet; and the draft from 28 feet 6 inches to 29 feet. In general outline, in the disposition of the guns, masts, smokestacks, superstructure, etc., the new ships will conform very closely to the "Florida." The principal change is in the addition of a two-gun turret, containing a pair of 12-inch guns. By comparison with the drawings of the "Florida" or "North Dakota," it will be noticed that the additional turret is placed between the two after turrets, and that it is elevated sufficiently to permit its guns to fire on the axial line, astern, over the roof of the turret astern.

All of the guns are carried on the median line of the ship. Turrets Nos. 1 and 2 will be mounted on the fore-castle deck, which has a freeboard of 28 feet. The axes of the guns in No. 1 turret will be about 34 feet above the water and the axes of those in No. 2 turret will be about 40 feet above the water. Aft of this turret will be the conning tower and the comparatively small bridge which is characteristic of the latest battleships. Aft of the conning tower will be the fore fire-control mast, flanked by searchlight towers. This type of mast has been adopted as standard for our new ships. Aft of this is the forward stack, abreast of which are two small open-work towers, carrying each a large searchlight. Then follow in their turn the main fire-control mast (both masts rise 120 feet above the water) and the after smokestack, and immediately abaft of the smokestack is a second open tower surmounted by a searchlight. The ship's boats are carried in two nests, one on each beam, and they are handled by a pair of boat cranes, the masts of which are surmounted by searchlights.

The fore-castle deck is carried aft as far as the mainmast. From this point the main deck extends flush throughout the remaining length of the ship, and upon it are mounted eight of the 12-inch guns, in four turrets. Turret No. 3 is placed immediately abaft the after smokestack, and the axes of its guns are about 32 feet above the sea. Then comes the engine-room hatch and abaft of this a group of three turrets, of which Nos. 4 and 6 carry their guns at an elevation of 25 feet above the sea, while the guns of No. 5 have a command of about 32 feet.

The guns will all be of the new pattern 50-caliber type, throwing an 850-pound shell with a muzzle energy of 50,000 foot tons. Four of these guns can be fired ahead, four astern, and the whole battery of twelve can be trained through wide arcs on either broadside.

For defense against torpedo attack, the ship will mount a numerous battery of 50-caliber 5-inch guns, of high velocity. Two of these will be carried forward in sponsons under the fore-castle deck, and the others in broadside on the gun deck behind 8 inches of armor protection.

One result of recent target practice and maneuvers and the experience gained in the cruise around the world has been to enhance the value of the 3-inch gun for torpedo defense. On the new ships and those that are now building, and on all the ships of the Atlantic squadron that have recently returned from the cruise, a large number of these pieces will be mounted—as far as possible on lofty positions. In the new 26,000-ton ships a pair of these guns will be carried upon the roof of the turrets whose guns have the loftiest command, as shown in our engraving on turrets 2, 3, and 5.

The general plan of armor protection will be similar to that of the "North Dakota" and "Florida," but with certain improvements. The main belt, which will extend from 3 1/2 feet above to 6 feet below the normal water line, will be 11 inches thick at the top and 9