

NEW SUBMARINE BOAT.

TWELVE HOURS WITHOUT A SUPPLY OF FRESH AIR.

A Vessel That Can Be Used Either as a Warship Destroyer or as a Pleasure Craft—Sliding Panels of Clear Plate Glass to Gaze Through at Sea Marvels.

Before many months have elapsed a submarine boat will probably be completed which will embody several features that are distinctly new. It is the invention of H. E. Dantzebecher, a naval architect and designer of yachts, who lives in Philadelphia, and who has contributed his share to the reputation this country has of late years won for skill in ship-building. Mr. Dantzebecher, in other words, is a practical man, and not of the class of inventors who construct dream fabrics which rise so conveniently superior to the limits of mechanical possibilities, cutting so fine a figure in print and so poor a one in practice.

Put compactly, what Mr. Dantzebecher purposes to give to the world

has been recognized from the start, and the study of the subject of submarine navigation has been almost entirely on that line.

Where Mr. Dantzebecher differs from his predecessors in the field is that he has aimed to build a craft which, while capable of being turned into the deadliest of submarine weapons, would at the same time be capable of such other purposes that private citizens as well as governments would have a use for it. He aimed to make a yacht, in other words, that was capable of sailing below the water as other yachts sail on its surface, and that, like the surface yacht, might be seized by the Government in case of war and converted into a torpedo boat.

To convert his yacht into a war vessel all that is required is to make torpedo-tubes of the two elliptical openings which are on each side of the bow, and which in ordinary times are used by the yacht's company as means of egress and ingress when the boat is lying on the bottom of the ocean. These openings are of such form that



"THE NAUTILUS"—SHOWING NAVIGATORS THROUGH THE GLASS WINDOW.

is a submarine yacht which will go to almost any depth beneath the surface of the ocean, and in which ten persons will be able to live comfortably for twelve hours without coming to the top for a fresh supply of air. Rising thus to get breath twice every twenty-four hours, the yacht will be able to travel eighteen days at full speed, or a distance of 4500 or 5000 miles if only sixty-six per cent. of her power is used.

Means of egress and ingress are provided, so that such of the passengers as feel disposed to step out for a stroll on the bottom of the ocean can do so. But, of course, they would have to dress for the occasion. The ordinary diver's costume would be sufficient.

Furthermore, there is an ample provision of powerful electric search-lights which can be turned in any direction from the conning tower in the top of the craft or from a point in its bottom. These lights are to be so intense that even in comparatively turbid waters objects will be made out with tolerable distinctness. In waters as clear as those of the Atlantic in the vicinity of the Bermudas, remote recesses of the ocean depths may be ransacked with the rays.

But the submarine observations need not be made solely in diving



H. E. DANTZEBECHER, THE INVENTOR.

suits. Mr. Dantzebecher has arranged sliding panels both in the sides and bottom of his craft which, when slipped back, expose large areas of thick but very clear plate-glass. Through these windows the submarine travelers can look out upon the illuminated depths of water at their ease. They can thus turn the entire ocean into a mighty aquarium, and study the structure, life and habits of the queer fish and grim monsters of its lower depths. And all this seated in a cozy room, with stenographers at hand to take down the words of the learned scientist as they fall from his lips.

And aside from this obvious value to scientific research, the amount of plain amusement the scheme suggests is bewildering to contemplate.

It is Jules Verne's fascinating Nautilus, which sailed "Twenty Thousand Leagues Under the Sea," turned into an actual reality—sliding panels, plate-glass windows, doors leading out into the dim, mysterious waters and all. In fact, it is very evident that Mr. Dantzebecher, like many thousand of other people, has had his imagination stirred and his inventive genius stimulated by Verne's delightful romance.

With substantially all the experiments in submarine boat-building heretofore the central idea has been the creation of a weapon that could work with deadly effect upon the modern battleship. This floating iron fortress has year by year grown so impregnable above the water line that the marine experts have been trying to get at the monster in some effective way from beneath. Torpedoes launched and directed in the ordinary way, on or from above the water level, are at the best but vague and random blows which can only be landed by chance or where the warship is caught napping. That the ideal way of planting the torpedo was from beneath the vessel attacked

either the Sims-Edison or the Whitehead torpedo can be used. With air supply enough to last a crew of ten men for twelve hours the yacht can approach the enemy unseen from a very great distance. There would be absolutely no warning, no hint of danger to those on board the ship she picked out for attack. While sailing along without a sail or a trace of smoke in sight to indicate the presence of an enemy, the most powerful battle-ship might suddenly be heaved into the air and her bottom literally torn out of her by a fearful explosion.

Those on board who escaped instant death would never know what had befallen them, whether their own boilers or their own magazine had blown up, unless the submarine yacht rose to the surface and fished them out of the water and the wild chaos of tossing wreckage which in a few moments would be all that would be left of their ship. If the vessel attacked were of a fleet her fate would be as much a mystery to those on board her sister ships as to her own crew. There would be a dull, smothered explosion, a lifting of the huge mass of metal heavily upward, then a staggering, headlong lunge into the depths of the sea and the tossing arms of those not dragged underneath by the suction as the ponderous mass sank out of sight.

On board the submarine yacht the spectacle would be even more thrilling than from the decks of vessels on the surface of the water. After hurling its torpedo low down against the exposed flank of the enemy there would be a reversal and swift whirling of the twin screws until the vicious little craft had darted back to a safe distance from the concussion and the wreck the deadly explosive had wrought. Then she could creep quietly back, and her officers and crew, with their electric search-lights turned on the scene and the steel panels slid back before her broad plate-glass window, could watch at their leisure every detail of the death agonies of a sinking ship and drowning men.

But aside from all mere anticipatory speculations as to what it may accomplish in actual warfare, Mr. Dantzebecher's submarine yacht is fast assuming the proportions of a practical business investment. Its details have all been carefully worked out and the plans drawn. The boat will be 100 feet long over all and twelve feet in diameter at the midship section.

It is a cigar-shaped cylinder in form, for the reason that the cylinder will best resist the pressure of the water, which at a depth of ninety feet is thirty-nine pounds to the square inch. When submerged there will be a displacement of 169 tons. The plating in the middle fifty feet of length is half inch of mild steel, with a thickness of three-eighths of an inch at the ends.

"The diving apparatus of the boat," said Mr. Dantzebecher in a recent interview, "is radically different from anything yet constructed, and is copied from the fish. There is a shaft extending athwartships and going two feet beyond the hull, to which are attached the diving planes, which are horizontal rudders, placed one on each side and two feet wide by ten feet long, located about twenty feet from the bow. There is also a duplicate set of these planes about the same distance from the stern, and so designed that they may be worked independently or together. A fish balances in the water, and rises, falls or maintains his level by the use of the two fins placed just back of his gills. This is a fact of which any one may convince himself by watching gold-fish in an aquarium."

"These diving planes, placed fore and aft, will in the same way control the depth of the hull in the water, a set of levers in connection with cylinders either elevating or depressing them for rising or falling in the water, and so arranged that the pressure of water outside of the hull makes it automatic in operation and keeps the boat on an even keel at all times at any desired depth.

There will always be maintained a reserve buoyancy of from 700 to 1000 pounds, so that should the machinery in any way become disarranged the hull will at once come to the surface.

"The boat's air tanks will be constructed for a pressure of 1000 pounds, and ventilation is provided for by blowers and pumps, which exhaust the impure air to one compartment, where it is pumped overboard, and the properly regulated supply from the tanks will keep the air pure.

"The boat will be driven by two gas engines of eighty horse-power each, direct connection, each engine having two cylinders. This gas-power engine is used because it keeps all fire from the hold, the gas in the engines being made from gasoline and exploded by electric spark from the storage battery plant. The engines will exhaust, when on the surface, to the open air, but when running submerged will exhaust into a condenser, and the gases of exhaust will then be discharged outboard by the vacuum pump. They will also be made to disconnect from the driving shaft, and one will be utilized to run the dynamo and the other to furnish power for the air compressor."

A Philadelphian of great wealth is furnishing the money to build this remarkable craft. The interest he takes in it is solely for its possibilities in the way of advancing scientific knowledge of the ocean depths. The actual boat now in course of construction is fitted with electric cooking apparatus, etc., and in addition to quarters for the crew, which will consist of first and second officers, two engineers, cook and assistant, will have berthing space for eight people in a main saloon. This saloon will also serve as a dining-room, of which the woodwork will be painted white, so that the interior will be as light as possible, deadlights in the upper hull shedding a subdued light in all the compartments.

When the craft is completed it is the intention of the owner to invite a number of men prominent in science to make a cruise to the bottom of the sea with him. The estimated cost of the vessel is \$41,000. It is expected to have a speed of fifteen knots per hour.

A 340-Pound Black Bass.
The fish in this picture swallowed seven pounds of bait and jerked about the water for half an hour a boat containing two men.

When he was subdued and landed he was found to weigh 340 pounds. His length was seven feet.



He was a black sea bass caught off the California coast, near Pasadena. Some of his kind weigh 800 pounds. None goes under a hundred. The fish has all the habits of the fresh water black bass.

An Elephant Preserve.
An adequate effort is at last to be made to prevent the extinction of the



ONE GOOD AND FOUR BAD POSITIONS.

elephant. The Government of India has adopted a regulation preventing the killing of these animals in a reserve which extends from Sheikh pass to the Afghanistan frontier. The area is approximately 200 miles by fifty. The herds of elephants which remain in this reserve are at present confined to a much smaller area of about forty miles square in the Gadabur mountains.

Rio de Janeria, Brazil, has 3665 tobacco stores and 4080 saloons.

RIGHT AND WRONG POSITIONS.

Illustrations of the Proper and Improper Methods of Getting on a Bicycle.

The accompanying pictures, says the Chicago Times-Herald, show some of the many shades of difference between the right position, in which a woman may ride gracefully and easily, and the wrong positions, in which she is sure to look awkward and uncomfortable. Many women may find in these pictures, too, hints that will help them to correct their styles of riding and enable them to better enjoy an exercise which has been only half pleasurable in the past, because they did not know how to follow it.

It is easy to see what is the difficulty with the woman shown in figure No. 1, what it is that makes her look as if she were working a sewing machine rather than riding a wheel. Her saddle is too low. If it were raised to its proper height her knees would not pump up and down before her chin with every revolution like a pair of piston rods. If it were raised she would have a decidedly better appearance, her skirt would hang better, she would ride more easily and it would not be hard for her to guide her wheel, as it certainly is in the position in which she is shown.

The awkward position shown in figure No. 2 is the result of having the saddle too far back from the handle bars, so that the rider can just reach the steering apparatus and no more, and so that she has to push forward on the pedals almost as much as down in propelling her wheel. The position which that adjustment of the machine gives makes the rider look as if she were trying to keep her seat on a bucking bronco from which she was expecting to be thrown at any instant. If the saddle were brought forward a little and raised slightly the position would be good. The lady would be sitting over the pedals, too, rather than behind them, and would have half enough of her weight on the handle bars to guide her machine easily and safely.

There is such a thing, however, as having the saddle too far forward and too high, as is shown in figures 3 and 4, which illustrate positions just the reverse of those in the figures explained above. In figure 3 the rider has the appearance of climbing a steep hill and working very hard in the ascent, simply because her saddle is too low and too far forward. She has to push back on her pedals rather than down and has not room enough between the saddle and the pedals to give full swing to her knees. Raising the saddle and putting it back a little would give the rider a graceful and easy position.

The difficulty shown in figure 4 is the opposite of that in figure 1—the saddle is too high. The rider has to tip forward in order to touch the handle bars and her toes just reach the pedals when they are at their lowest point in making a revolution. That attitude is, perhaps, the most tiring that can be assumed by a rider on a long journey, as it throws the entire body out of position. The adjustment would be correct if the saddle were lowered so that the pedals and handle bars could be reached easily and the lady would find cycling much easier and more pleasurable than she can in the attitude in which she is shown.

All that is necessary to make any of the changes suggested and to adjust wheels so that the riders can look and be comfortable rather than awkward and uncomfortable is a monkey wrench and a little common sense. With those nearly all the changes that are necessary to put women's wheels in proper condition can be effected.

A proper position for a woman on a bicycle is shown in figure 5. The rider there sits easily and gracefully, and the work of propelling her wheel is not half the work exerted by any of the others. She not only looks well but it is a position in which cycling exercise is play rather than labor, and beneficial rather than harmful.

Here are two good rules for women (and men as well) to follow in adjusting their saddles and handle bars:

Have the saddle so high that the heel of the foot just reaches the pedal when it is at

DECREES OF FASHION.

SO-CALLED PREVAILING STYLES IN THE DOMINION OF DRESS.

Natty Tennis Suit of Checked Linen.—Showing Ceru and Blue, With Skirt Specially Adapted to Wash Fabrics—Stylish Plaited Waist of Figured Blue Dimity.

May Manton writes that checked linen showing ceru and blue was chosen for this natty tennis suit; the collar, cuffs, belt and front decoration



SUIT OF CHECKED LINEN.

of the skirt being made of plain blue. Three box-plaits are laid in the back and three in the front, the centre plait in the front concealing the closing which is made with button and but-

accomplished by shoulder and under-arm seams, together with under-arm gores, which separate the fronts from the plaited back. Five box-plaits are laid in the fronts, the closing being effected by button-holes worked in a fly.

The sleeves are of the regulation shirt style; they are shaped with inside seams only and gathered top and bottom. The wrists are completed with linen cuffs of the newest design.

The waist will develop in percale, dimity, cambric, lawn, gingham, madras, silk, etc. The design can also be successfully carried out in light-weight chevot and French flannels, and worn for yachting or cycling, the warmth of the material providing an excellent preventive against sudden chill.

To make this waist for a lady in the medium size will require four yards of thirty-six-inch material.

Linen Lawn Much Worn.

A fine linen lawn is being much worn in Paris, and an entire costume of singular charm, suggesting that it should be taken to Ascot, made with the skirt crossed with insertions of Maltese lace in diamond patterns, was seen, the bodice showing the same decoration, fastening down one side with a frill of lace, and cut square at the top to show a little chemisette of white lisse; this drooped over a belt at the back and in front, made of white kid, fastened with a buckle elaborately jeweled.

Dainty Frock for a Little Girl.

This dainty little frock is designed for girls between the ages of two and ten years. Plaid woolen was the material selected, with narrow velvet ribbon and tiny gilt buttons entering into the decoration. The becoming fullness of the waist is due to gathers at the upper and lower edges, where they are confined by velvet-trimmed bands. The garment closes invisibly at the centre-back. Buttons and button-holes can be used in closing if preferred. Prettily shaped epaulettes extend over the shoulders that are also decorated with velvet and buttons, and have a pronounced flare at the outer edge.

The full-round skirt has a straight



LADIES' BOX-PLAITED WAIST.

ton-holes in a fly. Smooth under-arm gores separate the front from the back which has a pointed yoke. A casing is sewed at the waist line through which tapes are run to regulate the fullness, and the lower portion of the waist is worn beneath the skirt. The turn-down collar that finishes the neck is mounted upon a high neck-band, and can be made removable, if so desired. The sleeves, of moderate width, are gathered at their upper and lower edges; straight cuffs finishing the wrists and openings being made in back of sleeves that are finished with pointed overlaps closing with link buttons. A narrow belt encircles the waist.

The skirt is admirable for summer wear, its straight-back breadth adapting it specially to wash fabrics. The sides display the fashionable ripple effect on each side of the gored front, the straight back breadth falling in graceful folds from gathers at the top. The placket is finished in centre-back and the top is completed with a straight belt.

The style, which is an unusually smart one, can be developed in percale, chevot, duck, dimity or gingham with collar and cuffs to match or of white linen. Blue serge is also suitable for making and the suit can be worn for yachting, shopping or traveling as well as for tennis.

To make this waist for a lady in the medium size will require three and one-half yards of thirty-six-inch. The skirt will require five and one-half yards of the same width goods.

Popular Design for Box-Plaited Waist

The plaited waist has ever been a popular design, and its appearance in sheer summer fabrics will undoubtedly meet with approval. Figured blue dimity was selected for the stylish waist shown in the large illustration and described by May Manton. The collar and cuffs are adjustable and made of white linen. A jaunty stock of red surah completes the neck, and the belt is of red leather. The waist is unlined and the adjustment is

lower edge that will permit of a wide hem or can be trimmed as illustrated. The top is gathered and sewed to the bottom of the waist, a placket finishing at the centre-back.

Lawn, nainsook, chambray, gingham, dimity, challis and light-weave fabrics are commendable for making. Braid, ribbon, velvet or insertion will trim it effectively.

The guimpe worn with this frock is of white cambric, and two yards of



GIRL'S GUIMPE FROCK.

thirty-six-inch material will be required for making. To make the frock for a girl of six years will require three yards of the same width material.

The newest stitching for gloves is in two shades. For instance, two rows of lavender inside, with black stitching all around, making the outside and inside row of black.