

construction of our 13,500-ton battleships and 12,000-ton armored cruisers until next year, while greatly to be deplored, would be fortunate should the Bureau of Construction see fit to take advantage of the fact and increase the speed of the battleships and armored cruisers to 19 and 23 knots respectively; in which case they would be more up-to-date vessels at the time of their completion. It is likely that Congress would have to be asked for an additional appropriation to cover the increased cost, also the displacement would probably have to be increased; but according to the exact wording of the naval bill this would be feasible. There is no plausible reason why the United States should not have ships the equal of any afloat or under construction. England has set the speed of her new battleships and armored cruisers of the "Duncan" and "Drake" classes at 19 and 23 knots respectively and they will be completed and in commission sometime before our new vessels. It is difficult to understand why, in view of the all-important lessons taught by the late war, the naval authorities do not replace the 1 and 6-pounder guns on the plans of the "Maine" class, also the proposed new vessels, with 12 and 3-pounders. It was clearly demonstrated that the 1-pounder gun has no place on armorclads where the fighting range is from 1,500 to 3,000 yards. The 12 and 3-pounders are conceded by nearly all naval authorities to be the ideal light rapid-fire guns for both battleships and cruisers.

The construction of six unprotected cruisers of about 2,500 tons displacement, of the low speed of 16 knots per hour, which seems to have been decided upon according to the clipping I inclose, if true, seems to be only one step removed from the absurd act of Congress, over a year ago, when it inserted a clause in the naval bill providing for the four obsolete monitors now under construction. It has lately been discovered that the six small cruisers can be raised to about 3,200 tons displacement, and still be constructed within the amount appropriated, \$1,140,000 each. Why not build six protected cruisers of a little less displacement, and about the speed of the "New Orleans," or six improved "Raleighs," and arm them with two 6-inch and ten 5-inch rapid-firers, or ten rapid-fire 6-inch.

It is reasonably certain that vessels of the above type could be built for the amount appropriated, and would not be a comparatively useless waste of the people's money, as will be the case if the present plans are persisted in. It would be fortunate if Secretary Long would withhold his approval of the plans for such extremely slow vessels. An expression of opinion from the editor as to the value of the proposed slow vessels in time of war would be interesting. If they were attached to a squadron they would be of no value, and would keep down its speed to about 14½ knots. If they ventured out to sea, and encountered a hostile ship or fleet, they would probably have to surrender, or fight a more powerful antagonist, as they would have no choice of battle on account of very low speed. Of course they could be used for police duty in times of peace, but warships are supposed to be built to fight also, and these vessels seem to be woefully deficient in two of the most important requirements, speed and protection.

The proposed large coal supply of the small cruisers is unusually heavy, and is important, but good speed, protection and armament will win a vastly greater number of battles than a hundred or so tons of coal. It is sincerely to be hoped that the plans as outlined in the inclosed clipping will not be the ones finally adopted, and it does not seem possible that the Bureau of Construction would commit itself to vessels of the unheard-of speed of 16 knots in this advanced period of warship construction.

A SUBSCRIBER.
Billings, Montana, April 26, 1899.

[The question of speed in warships is treated at some length in our editorial columns. In comparing the speed of our new battleships and cruisers with that of the new 19-knot battleships and 23-knot cruisers of the British navy, our correspondent overlooks the fact that our ships will be more heavily armed. We are willing to sacrifice a knot of speed for a preponderance in armament. The six new vessels referred to by our correspondent have been designed to meet the new conditions imposed by our possessions in the Pacific and the West Indies. They are intended for service on distant stations, to reach which, it is necessary to make long unbroken trips, or on stations more or less remote where docking facilities are wanting.

With a view to this they are to be sheathed and coppered (the weight of which covering reduces the speed by from a quarter to half a knot) and they are to have an unusually large coal supply, sufficient to carry them 8,000 miles without re-coaling.

The comparatively low speed is in agreement with a growing belief among naval men all over the world, that while higher speed is desirable in the battleships and large cruisers, it is not so essential in the smaller cruisers which do police duty on distant stations.—ED.]

PLANS are being made for the projected canal between Berlin and Stettin by which vessels of heavy tonnage will be able to reach Berlin.

Mr. Eddy's Later Experiments.

Mr. W. A. Eddy, of Bayonne, N. J., has been continuing his experiments of sending up a hot air balloon carrying a thermometer, to which we have already referred. The balloon was held captive at a height of 400 feet. The earth temperature when the balloon first ascended was 69° above zero. Five minutes later when it was hauled down the thermometer registered 66°. At the second ascension, when the height of 600 feet was reached, there was a difference of 3°. The balloon is 12 feet in diameter and exerts a lift of 4 pounds. The thermometer weighs 3 ounces and is arranged to give the readings of the extreme heat and extreme cold. It was impossible to use kites because the wind was so light that they would not remain aloft. The expenses of the experiment are borne by the Hodgkins Fund of the Smithsonian Institution.

A BEDSTEAD FOR INVALIDS.

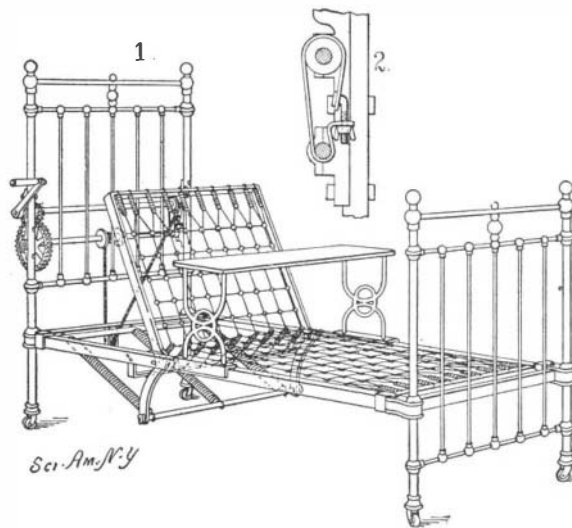
We illustrate herewith a bedstead for invalids, which has a head portion arranged to be raised and held yieldingly in an inclined position by springs.

Fig. 1 is a perspective view of the bedstead. Fig. 2 shows a brake employed for the purpose of preventing too quick a movement of the head-portion under the action of the springs.

The movable head portion of the bed bottom is pivoted to the side rails of the bedstead. Arms extend downwardly from the sides of the head-portion and are connected at their lower ends by a cross rod. To these cross rods and to another cross rod secured to the side rail springs are secured which serve to swing the head portion into an inclined position.

In the head-posts of the bedstead, a power-shaft and a drum-shaft are journaled, connected by gear-wheels, and operated by a crank. Around the drum-shaft a rope is wound which is connected with the movable head-portion.

By releasing a dog which controls one of the gear-



COUGHLIN'S BEDSTEAD.

wheels, the spring secured to the cross rod connecting the downwardly-extending arms of the head-portion will swing the head-portion upward, the springs being of sufficient strength to raise the patient lying upon the bed. In order to prevent too violent a movement of the head-portion, a brake-strap engaging the power-shaft and the drum-shafts as shown in Fig. 2 is employed.

As indicated in Fig. 1, a table may be placed upon the side-rails, the table being so mounted that it can be pushed lengthwise but not sidewise.

The bedstead is the invention of William Coughlin, 252 East Fifty-second Street, Manhattan, New York city.

American Bridges for Burma.

The Burma Railways Company invited six English and two American firms to make a tender for the Goktick viaduct in Burma. Four of the English firms responded, and the most favorable English tender required three years for completion of the work, and the cost was to be \$590,000. The American tender proposed to complete the work in one year at a cost of \$300,000. It is needless to say that the Burma Railways Company accepted the tender of the American company.

Our Losses in Two Wars Compared.

The War Department has prepared a memorandum which compares the losses in the Spanish War with those in the first year of the Civil War. The aggregate strength of the troops employed in the war with Spain was approximately 267,000, covering a period from May, 1898, to April, 1899, inclusive. During this time deaths from all causes amounted to 6,190, or 2¼ per cent. The mean strength for the first year of the Civil War was 276,371, and the aggregate loss by deaths from all causes was 19,159, a percentage of 6.8.

Science Notes.

The Belgian consul at Manila states that money for the construction of the projected railway connecting the north and south portions of the island of Luzon with Manila has already been subscribed in Belgium.

Prof. Campanile and E. Stromei explain that phosphorescence in Geissler tubes is due to gradual charging and extremely rapid discharging of the walls of the tube at the part covered externally by the anodic tin foil, the phosphorescence being set up on the opposite wall during the extremely rapid discharge.

A railway company of Brooklyn has a special car fitted with a hydraulic jack by which the car can be lifted off the rails of the crossings and put on another track having no connection by switches. They also have a special tower car with an adjustable platform on the roof enabling repairs to be effected on the "up" trolley wire while the tower car is on the "down" line. This car is very useful in stringing trolley wires.

Dr. Koeppe notes that distilled water is decidedly deleterious to protoplasm, absorbing from the same saline constituents and swelling its tissue even to the extent of destroying the vitality of the cells. Distilled water has a similar action on the cells of the stomach, producing in some cases vomiting and catarrhal troubles. He concludes that the toxic property of certain glacier and spring water is due to its absolute purity, which also explains why the sucking of ice and drinking of glacier water sometimes causes stomach derangement.

A German inventor has devised a curious display apparatus which consists of a mirror having its rear face silvered to such a degree as to render it capable of reflecting objects. A picture is secured in the rear of the mirror and under ordinary conditions it is indistinguishable through it. An electric light is mounted in the recess at the rear of the mirror, which can be lighted and extinguished at will. When the current is turned on, the picture on the back is brought into view, and, as the light may be flashed intermittently, a curious effect is produced.

Sir W. B. Richmond is pursuing his campaign against the smoke of London. The Coal Smoke Abatement Society, over which he presides, is attracting leaders of artistic and scientific circles of the metropolis and now seeks to enlist as well the skill of those in the mechanical world. At a recent meeting of the committee it was decided to give gold, silver, and bronze medals to the three best exhibits in the coal smoke abatement section of the forthcoming Building Trades Exhibition at Agricultural Hall, London. Sir W. B. Richmond has promised to design the medals.

The "Ernest Bazin" will shortly be sold at auction at Liverpool. According to the announcement of the auctioneers, "this fine model of engineering skill," which cost nearly \$100,000 to build, will be offered for sale. Great attention is directed to the suitability of this boat as an attractive novelty show steamer and advertising medium for the great coast pleasure resorts, and it will doubtless prove of more interest and importance to those in this class of business than it ever will be to navigators. It has also been suggested that the rollers may be used for gas buoys or caissons.

An Italian medical journal calls attention to the fact that a Brussels bank disinfects all its soiled notes and commends the practice which is followed by the Bank of England of destroying all its notes that come back to the bank. Our own government would be very wise in following such a course. Where the notes are very old they are destroyed, it is true, but every note ought to be as soon as it gets in the hands of the government. Infection by paper currency is probably not very frequent, but, at the same time, there are cases on record which can be directly attributed to this cause.

According to a decision of the Court of Errors and Appeals of the State of New Jersey, property owners need not permit telegraph poles, telephone poles, and electric light poles to be placed on the highways in front of their property without due compensation. Corporations cannot set their poles in the night time or at any other time when they can take property owners unawares and thus secure a right of way. They must obtain the consent and agree with the property owners as to the rate of compensation, or, if they cannot agree, they must go to court and have the issue adjudicated there.

In Sweden the food given to reindeer is "reindeer moss," a lichen highly prized by the Lapps, and which grows abundantly in the Arctic regions, almost as luxuriantly on bare rocks as in the soil. It covers extensive tracts in Lapland, making the summer landscape look like a field of snow. The domesticated reindeer are never as large as the wild ones. The domesticated Siberian reindeer are larger than those of Lapland. No care at all is taken of the deer. They thrive best by being permitted to roam in droves and obtain their own sustenance. The moss can be used as human food, the taste being slightly acid. Attempts have been made to feed hay, roots, grain, etc., to the reindeer, but they have not succeeded.