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The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are sharp, the articles short, and the facts authentic, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

## THE MENACE OF THE NOISELESS GUN.

The noiseless gun, of which we gave an illustrated description in our issue of February 20th, 1909, must be regarded as one of the most successful inventions of the day. As a means of securing that secrecy in warfare which is essential to successful tactics, it is equal in importance to smokeless powder. To meet the attack of an enemy that can be neither seen nor heard will be a problem indeed, and the inventor is to be congratulated upon having introduced into warfare one more of those exacting conditions which are tending to make modern warfare so costly and destructive as to prohibit it altogether. In so far as the Maxim gun silencer renders war more difficult, it may be regarded as making indirectly for the preservation of peace, and, therefore, if we choose to so regard it, for the betterment of international conditions.

If it were possible to confine the possession of the new weapon to the military, for whose use, and for whose use alone, it was designed, we would have nothing to say against the device. But it cannot be denied that the appearance of this gun has greatly enlarged the opportunities for the commission of undetected crime. This fact is clearly realized by the Police Department of this city; and already the chief of police of the city of Pittsburgh has taken steps to prevent the carrying of noiseless guns, and has announced his intention to prosecute, with the utmost severity that the law allows, all persons who are found in possession of the silencing attachment.

It is well understood that fear of detection is one of the most powerful deterrents to the commission of crime. It is because it does its work so silently that certain races prefer the knife or the stiletto to the rifle and revolver. The menace of the noiseless gun lies in the fact that the man with murder in his heart may now dispatch his victim in silence. Rarely does the burglar break into the home of the private citizen unarmed; and yet it is a fact, well understood by the police, that the last thing he desires is to be driven to use a revolver. But the housebreaker who carries a "silencer" might shoot the owner without the slightest fear of the report being heard by watchman or patrol, or even by the inmates of other rooms in the house. The new weapon is surer than the blackjack. A belated pedestrian might be shot, and the robbery of his person carried out, without the police on adjoining streets having the slightest suspicion that a crime was being committed. Not even the cover of night will be necessary for the concealment of deeds of violence. The fatal bullet can be sent to its mark on a crowded thoroughfare and in broad daylight, without there being any evidence of smoke or report to show whence it came.

The deadly character of the noiseless gun renders it, in the hands of unscrupulous people, a distinct menace to society; and we are strongly of the opinion that it should be made the subject of immediate and very stringent legislation. The principle upon which such a law would be founded is already recognized in the penalties which are attached to the carrying of concealed weapons. The frightful possibilities of undetectable crime, which are opened up by the appearance of this weapon, should be met by a statute declaring that the manufacture, sale, or possession of this weapon, for any but strictly military purposes, is a felony, and punishable by a long term of years in the penitentiary.

## OPPORTUNITY FOR AMERICAN STEEL CONSTRUCTION AT MESSINA.

The United States consul at Naples has drawn attention in a recent report to the promising opening for American capital and enterprise in connection with the rebuilding of the city of Messina. It seems that the sentiment of the people is entirely in favor of reconstruction. Large sums of money have been expended in the improvement of the harbor, whose site and general excellence are such as to render its abandonment out of the question. Although, as yet, no definite plans have been formulated by the government, it is generally understood that, as soon as sanitary considerations will permit, the work of removing the debris of the city will be energetically carried through. It will be several months, however, before this work will be commenced.

In view of the fact that there will be a strong demand for the construction of houses that are both fireproof and proof against earthquake, the situation will offer an unrivaled opportunity to introduce American methods of building construction. The San Francisco disaster was made the subject of a very thorough investigation by our architects and engineers, and its lessons were carefully gathered and recorded. It was proved that the steel frame building, particularly in cases where the walls were carefully tied into the steel framework, is admirably adapted to resist earthquake stresses. Reinforced concrete construction, also, showed, in the limited amount of such work as existed in San Francisco, that, with certain modifications, it could be made proof against serious damage by earthquake. In the intervening years, great advance has been made in our knowledge of the strength, and best methods of design, of reinforced concrete; and this system of construction, if it were applied to the rebuilding of Messina, would be an ideal form, especially for buildings of moderate height. Our consul pertinently suggests that, in addition to the presentation of plans and estimates for rebuilding, American firms will find it greatly to their advantage to be represented on the spot by intelligent agents who are experts in the class of construction that is recommended.

## THE SUBWAY SITUATION.

If the publication of plans and the submitting of proposals to the Public Service Commission is a guarantee of an early enlargement of rapid transit facilities in New York, the outlook for the future is rosy indeed. The company which is responsible for the Hudson tunnels has offered to extend its system by way of Sixth Avenue and Forty-second Street to the Grand Central terminal. The Interborough Company has proposed to enlarge its present system by the construction of a two-track subway from far north in the Bronx to the Battery, by way of Lexington Avenue and Seventh Avenue, and to increase the facilities of its elevated system by laying a third track for express service on its Second and Third Avenue systems; also it asks permission to lengthen the present subway platforms, to admit of the operation of ten-car express and six-car local trains. The Public Service Commission has announced that it is completing plans for a four-track system by way of Lexington Avenue and Broadway, to be built for most of the distance on two levels, with the local tracks above the express. It is understood that the Public Service Commission is disposed to grant the application of the Hudson Tunnels Company on the ground, not only that it will furnish a most important cross-town service connecting the steam railroads which enter the Grand Central station with those that terminate in New Jersey, but that it will bring the Sixth Avenue shopping district into convenient touch with the steam and electric roads, long-distance and local, of the east side of Manhattan Island. In granting this franchise the Public Service Commission will undoubtedly have the hearty indorsement of the general traveling public. The Commission is not disposed to grant the application of the Interborough Company, and this chiefly for the reason that it considers its own plans for a Lexington-Broadway four-track system to be greatly superior in convenience and capacity to the two-track systems proposed by the company. The request for permission to lengthen the existing subway platforms will undoubtedly be granted; for this change alone will result in an increase of the carrying capacity of the subway about twenty-five per cent. Moreover, it can be accomplished for \$1,000,000—a very moderate outlay for an increase of carrying capacity of from 150,000 to 200,000 per day. The proposal to add a third track on the Second and Third Avenue elevated roads is certain to meet with popular opposition, on the ground that the existing elevated roads are a disfigurement to the city, and that to increase the trackage would further darken the streets. In view of the loosening up of the East Side congestion during the rush hours, which would result from the addition of these express tracks, we think that the Commission should hesitate before finally turning down this part of the Interborough's proposal.

## LIMITATIONS OF THE HYDROPLANE.

The hydroplane is regarded as such a distinctly recent invention, that it will doubtless surprise many yachtsmen to learn that, as far back as the year 1872, the theory of this type of boat was most exhaustively investigated by William Froude, the father of the modern theories of the resistance of ships. According to our contemporary, the Yachting and Boating Monthly, the experiments carried out at Torquay, England, were made with two models, respectively 3½ and 10 feet in length. The lift and speed were recorded by special automatic apparatus. Mr. Froude found that the maximum resistance of a 2,500-ton ship would not be obtained until a speed of over 120 knots was reached. The first of the series of deductions arrived at was that even if by some extraneous means the ship could be started at the tremendous speed necessary to lift it completely out of the water, it would be impossible for the boat to carry the horsepower necessary to overcome the air resistance alone. Furthermore, if a ship were being driven along the surface of the water at a speed of say 60 knots, and met a wave of twice her own length with 10 degrees of maximum slope, she would be launched upward at that angle, and would take a flight of nearly 100 feet before she again reached the water. The upward impulse would involve the communication of some rotational motion, which would inevitably add to the destructive effect of the shock when she reached the next sea. The final investigation was directed to the determination, first of the horizontal component of the normal pressure on the inclined plane, and secondly of the surface friction of so much surface as remains immersed. Mr. Froude's demonstration, as far back as 1872, of the fact that the inherent principles of the hydroplane prohibited the attainment of the phenomenal speeds which its advocates claimed for it, is summed up as follows:

If when the ship has become wholly lifted on the inclined plane we seek to diminish that element of resistance which consists of the horizontal component of the weight supported on the incline, by reducing, say halving, the steepness of the plane, then, in order that with this flattened inclination the dynamic action of the water should yield the same support, the plane must assume a doubled area of immersion, and this doubled area will involve a doubled frictional resistance. But if again we seek to diminish the area of immersion by increasing the speed, the friction per square foot will be increased in the same ratio as the lifting force per square foot, and the immersed surface, though reduced in area, will retain the doubled frictional resistance which the halved steepness of the inclination introduced. Thus, while we reduce one element of the resistance in any given ratio, we at the same time increase the other element in precisely the same ratio, and their combined amount cannot be reduced below the limit at which it stands when the two elements are equal.

If the limitations of the hydroplane, as thus disclosed thirty-seven years ago by Mr. Froude's investigations, had been known, or fully understood during the recent revival of interest in this attractive device, much misdirected effort and inevitable disappointment would have been avoided.

## AVIATION IN AMERICA AND THE SCIENTIFIC AMERICAN TROPHY.

Judging from the recent performances of Mr. McCurdy in Nova Scotia with the fourth aeroplane—the "Silver Dart"—of the Aerial Experiment Association, the year 1909 is to witness even more rapid progress in aviation here than was made in France last year.

After having made comparatively few practice flights, this young Canadian engineer, on March 10th, increased his previous records to nearly 20 miles in two flights of 13 and 22 minutes duration respectively. Two days before he had already made a flight of 11 minutes duration. The aeroplane, mounted on wheels, started and landed on the ice of Lake Bras d'Or, near Baddeck, N. S. In one of the flights this new aviator is said to have attained a height of 50 feet and to have performed various evolutions. At his request, the Aero Club of America is sending a representative to Nova Scotia to officially control a flight for the Scientific American Trophy, which it has recently been decided to award each year to the aviator who makes the longest flight in an official trial. Hereafter, anyone having a heavier-than-air machine which has shown itself capable of flight can have an official trial by notifying the Aero Club of America two or three days in advance, and remitting double the railway fare from New York to the point of trial, plus \$4 for each day upon which a trial is to be made. The minimum distance for 1909 is 25 kilometers (15½ miles). If a sufficient number of machines are developed during the next few months, it is probable that a contest will be arranged near New York city.

The Scientific American Trophy has served a useful purpose in encouraging the development of new flying machines. From now on it will stand for the greatest achievement in aviation in America.