made in manufacturing tinfoil and in applying it to manifold commercial uses. New machines have been made to work it up into handsome ornamental forms, and considerable capital has been invested to extend its usefulness. There is very little export trade in tinfoil, as the foil is also made extensively in England, France and Germany, but the home trade is adequately supplied by the four tinfoil factories in this country—two in New York, one in Philadelphia, and another in St. Louis. After the expiration of the original patents these four factories started almost simultaneously, and they have controlled the output of the material ever since.

New machinery and processes for improving the tinfoil are being invented nearly every year, and the quality of the material produced to-day is infinitely better than that of a dozen years ago. A good deal of the new machinery is made to enhance the ornamental effects of the foil, but not a little of it is made to increase the strength and wearing quality of the material. In the druggist and confectionery trades the demand for very highly ornamental tinfoil effects is especially urgent, and artists of considerable ability are engaged to produce fancy patterns. The silvery surface of the tinfoil is made more effective by fancy patterns of stars, figures and fine lines, which are stamped or embossed in the sheets by special machinery. Recently machinery was made to print the patterns on the sheets of foil in colors. In order to do this the sheets of foil are put through regular printing cylinder presses, which not only color the patterns but stamp in the "dead" effects of various figures and lines. The machinery required for this delicate work is quite elaborate and represents part of the invested capital of the plant.

The tinfoil is also lacquered handsomely with gold, which, in connection with the embossing and printing in colors, produces remarkably artistic effects. Many large firms employ these fancy effects as trade marks which are stamped or printed on all the foil they use as wrapping for their articles. Tinfoil is growing rapidly in use for wrapping purposes where food and other articles must be kept from the air as much as possible. Its first use was for tobacco wrapping, and the demand in this trade stands first to-day. Fine cigars, plug tobacco and cigarettes have the fine aroma of the tobacco and the natural moisture retained indefinitely by this process. Most prepared foods are wrapped in tinfoil, and now that the manufacture of these has grown tremendously the demand for tinfoil has increased also to remarkable proportions. Cheese, yeast cakes, and other products of the delicatessen order require annually tons of pure tinfoil. Confectioners have also resorted to the use of tinfoil for wrapping their choice candies in preference to tissue paper. The drug trade has found infinite uses for the foil because of its air-tight qualities, which keep the goods from direct contact with the atmosphere.

Perishable goods shipped to warm, tropical countries are frequently wrapped in tinfoil to exclude the air and to retain the natural moisture. A combination of thin paper and tinfoil is considered better for food products than the foil alone. It was considered better not to have the foil come in direct contact with the food, and consequently a machine was made by which the sheets of tinfoil and paper were firmly adhered together. These double sheets are used so that the paper alone comes in contact with the food, while the tin serves all the purposes of excluding the air. There is considerable labor of folding saved by this process, and only one instead of two foldings is required for each separate article.

Some foil is brought into direct contact with certain classes of food, which by its nature could not well absorb any poison from the foil, but the factories make all such foil wrapping from pure rolled tin. There is no lead mixed with this foil to give occasion for reports of poisoning from goods wrapped in tinfoil. This foil is more expensive to make, and the combination of tinfoil and thin paper is becoming more popular.

Bottle caps are manufactured largely out of tinfoil, but they are of a different quality and manufacture from that of the ordinary foil. The sheets for this work are spun on a lathe from a mixture of lead and tin. There is more lead in this foil than in the finer quality for general use. The foil is thicker and coarser, and as it never comes in contact with the contents of the bottle the amount of lead in it is immaterial from the consumer's point of view. The thickness of the tinfoil in common use runs from one-half of one-thousandth of an inch up to almost any thickness required by special trades. The thinner the foil is rolled or spun the more expensive it is. The foil is rolled usually in sheets fifty feet in length and in varying widths. Some machines are made to roll it twelve inches wide, but most of them have only half this width, as trade demands favor the narrower widths After the sheets are rolled they are stamped, printed, and embossed in suitable sizes and patterns, and then cut up in lengths desired. Millions of pounds are required for the trade in this country, and the market price runs from 75 cents per pound for the handsome embossed and lacquered foil down to a few cents a pound for the cheaper grades. G. E. W.

METHODS PROPOSED FOR DEALING WITH LONDON'S CONGESTED TRAFFIC.

Elaborate projects are being framed by the London County Council for dealing with the crowded thoroughfares of the English metropolis, and to inaugurate a system of intercommunication similar to that already existent in the most modern cities. The tramways are to be immediately converted to electric roads; the river is to be supplied with an efficient and rapid service of steamers; while it is also mooted that an attempt is to be made to relieve the congested condition of the Strand and Fleet Street by the construction of street subways similar to those of Boston.

With regard to the tramway systems, for some time past the County Council have been carrying out experiments to determine what method of supplying the current to the car motors is best adapted to the exigencies of the case. It has been decided to employ both the overhead trolley and the conduit systems, the former to be more generally employed in the less crowded thoroughfares of the suburbs. At the present time there are 115 miles of street tramways in London, and the carrying capacity averages 350,000,000 passengers per annum. With the present system of horse traction a profit of $1,250,000 is earned annually. If electric traction were employed it is computed that this profit would be increased to $3,300,000. A comprehensive idea of the earning capacity of the tramways may be realized from the first year's working by the County Council of the tramways south of the Thames. This service was purchased by the municipal authorities for $4,375,000, and the surplus upon the year's working amounted to $65,000. The mileage in this instance is 24 miles, with an earning capacity of $7,835.

One of the most perplexing difficulties with which the Council have had to contend in connection with their proposed inauguration of electric traction is the fact that the roads in the various districts through which the tramways extend are controlled by the local authorities, the majority of which are bitterly opposed to the change. There are no less than fifty of these small local authorities possessing the power of veto over the roads. The objections in many instances have been successfully surmounted, but negotiations are still being carried on with those authorities who remain obdurate, and it is anticipated that the installation of the electric plant will be commenced almost immediately.

With regard to the river traffic the Council considers that the development of a fast and frequent service upon the waterway is an efficient means of relieving the streets. The service at present in vogue is distinctly inadequate, and is only for summer use. The boats are slow and antiquated, and the service too infrequent to commend its more widespread utilization. According to the scheme of the Council, it is intended to supply a three minutes' service; to provide a fleet of fast, comfortable, and modern river steamers; and, if possible, to secure the entire control of the river piers, which at present are under the auspices of the Thames Conservancy. The enterprise will cost $2,500,000 to carry through. The boats will cost $37,500 each. The piers will be transferred from the sides of the river to the center round the pillars of the various bridges, approaches to which will be provided. It is estimated that the cost of maintaining the service will amount to $700,000 per annum.

The suggestion of supplying underground tramways to the principal arteries of traffic, though generally favored, is beset with innumerable difficulties. For the most part, the streets of London are intersected in all directions by electric cables, gas, water, and pneumatic pipes, etc. Under these circumstances if such a tramway were constructed it would have to be at a great depth, which would have the effect of preventing its being used for the very purpose for which it was intended. If the descent of about a dozen steps from the street level were only necessary to give access to the subway, then it would doubtless prove a great success. To insure this, the network of obstructions would have to be removed, and this could only be accomplished at a great outlay. The general idea is to lay all pipes and wires in a long tunnel, running parallel to the tramway, so that access could easily be gained thereto for carrying out repairs, or for the laying of new material, without disturbing the surface of the street, and causing great inconvenience to the vehicular traffic. At the present time the principal thoroughfares in the metropolis are up for the laying of the government telephone cables, which are to extend over a mileage of 640 miles, causing widespread inconvenience. Many of the streets of London are provided with a duplicate thoroughfare below, in which are the gas, water, and other pipes, wires, etc., but the idea is not general throughout the city. The Council are carefully studying this scheme, and since the chairman of the Highways Committee, who have the subject in hand, has investigated the system in vogue in Boston, and is convinced of its practicability in London, there appears every symptom of its adaptation to the English metropolis within the near future.

The Central London Electric Railway has had the effect of considerably relieving the congestion of the streets, and has proved such a success that application is to be sought for Parliamentary powers to extend the railway at the city terminus at the Bank to Liverpool Street, the terminus of the Great Eastern Railroad, and which supplies the densely populated districts of Walthamstow, Stratford, Bow, Stepney, etc.; and also at the southern terminus at Shepherd's Bush. It is also stated that another similar railway is projected by an American syndicate to connect Victoria with Putney, a remote southwestern suburb.

WIRELESS TELEGRAPHY FOR THE PREVENTION OF SHIPPING DISASTERS.

For some time past numerous experiments have been carried out with Marconi's wireless telegraphy with a view to employing the system on lighthouses, etc., as a means of preventing maritime disasters. But the endeavors have only been attended with such mediocre success that it has not been considered advisable to develop the matter. But a novel device has now been invented by Mr. J. Gardner, of Manchester (England), which, so far as the present experiments are concerned, has been highly successful. It is termed an automatic signaler, from which it will be gathered that its mechanism is automatic in its action. The inventor claims that by this means an adequate warning is supplied to vessels of impending danger, within a zone, the radius of which has been previously determined. It may be either applied from ship to shore, or from ship to ship while at sea, with equal success and reliability.

The apparatus is somewhat similar to that utilized by Marconi. At the shore station a mast is set up, to the top of which is attached a metallic conductor. This conductor is connected to the transmitting apparatus, which is accommodated in a building in close proximity. The transmitter consists of an induction coil, and the accumulators for the provision of the current. The automatic portion of the instrument consists of a specially cut wheel, bearing the name of the danger spot to which the mast is attached. This wheel controls a Morse key. This wheel is maintained in constant rotation, the periphery being regulated to any desired time, so that one revolution may be completed in one, two, three or more minutes.

Vessels are supplied with a receiver, and directly a ship enters the danger zone the instruments print off on the tape machine in the Morse code the name of the danger spot it is approaching, at the same time setting a bell in motion; both bell and receiver continuing to operate until the ship has once more passed beyond the influence of the transmitting apparatus. All vessels that happen to enter the danger zone receive the warning simultaneously, as with Marconi's system the apparatus is not affected by any climatic conditions.

The preliminary experiments for demonstrating the efficacy of the scheme were conducted at the mouth of the Thames. The shore station was established at Shoeburyness. A steam launch put off from Southend provided with a receiving instrument, the invention of Colonel Hozier—the secretary to Lloyd's—and Mr. Nevill Maskelyne. A stiff breeze was blowing and a thick fog hung over the water. The launch stood about eight miles out to sea, and then the automatic apparatus at the shore station was set in motion, the zone of influence in this instance extending to seven miles. The launch then put about and wended her way shoreward. Suddenly the bell commenced ringing violently, and simultaneously the word "Southend," the name of the danger spot, was printed upon the tape machine. The vessel then put out to sea again, and entered the zone from another quarter, but the moment it entered the range of influence of the shore station the warning was received. For two hours these trials were continued, but with always the same result. The instrument never once failed in its working, thus conclusively testifying to its efficiency and reliability.

There were several well-known shipping men present at the trials, including the representatives of the Cunard, White Star, the American, the P. & O., and other leading steamship lines, and the secretary of Trinity House. In connection with its adaptation for vessels the receivers on two respective ships approaching one another would receive the name and course of the other. In view of the practicability of this automatic signaler and the possibility of reducing the number of maritime disasters by its utilization, the installation of the apparatus at several points of the British coast within the near future is probable.

The American losses of troops in the Philippines since August 6, 1898, are as follows, says The Medical Record: Killed, 741; died of wounds or accidents, 472; died of disease, 2,295; total deaths, 3,508; wounded, 2,638; grand total, 6,146.