NOVEL INVENTIONS TO LIFT THE S-51

Submarine Salvagers Rely on Under-Water Torch and Compressed Air

In attempting the tremendous task of raising the submarine S-57 rammed and sunk off Block Island on the New England coast last September, the navy department is undertaking one of the most daring and ingenious salvage operations in maritime history; for the rusty hulk of the fighting machine lies fast in stick clay at the bottom of the ocean under 130 feet of water.

The plan of salvage, as evolved by Lieutenant-Commander Edward Ellsberg of the construction corps after months of study, calls for methods and apparatus never before tried. One invention which will play a vital part in the job, writes L. U. Reavis in Popular Science Monthly for June, is a remarkable cutting torch, invented by Commander Ellsberg, which will work with full efficiency under water. Air pressure is supplied in such a way that it forms an envelope around the flame of the torch.

At present a buoy is anchored by a long rope to the deck gun of the S-51. A diver from the Falcon the principal salvaging vessel, will slide down this rope and land on the deck of the submarine. Other divers will follow. First they will lash eight steel pontoons to the sides of the wreck. Each of these will be fitted with a hose connected with air pumps on board the Falcon.

Two smaller "pilot" pontoons will be attached to the front and rear of the craft by sixty-foot chains.

Meanwhile other divers ,working with under-water torches, will close as many of the water-tight doors in the hull as possible, and cut ventholes in the bottom of the hull. Holes also will be cut in the hull at other points and the air hose lines from the Falcon will be fitted to them.

At the word of command the air pumps will be started, forcing the water out o fthe pontoons. The eight pontoons, when filled with air, will have a combined lifting power of 760 tons, and the two "pilot" pontoons will add 120 tons, making a total of 880 tons pulling steadily against the dead weight of the hull.

The supreme test will come when air pressure is applied to the hose lines connected to the hull itself. It is hoped that sufficient water can be forced out to add at least 500 tons of buoyancy [illegible] to break the grip of the clay.

ERICAN AUTO MEN FAVOR LIGHT CARS

(Continued from page 1.)

resulted in a much higher torque than is evident in the motor performance of the European cars, would eliminate the necessity for changing of gears and Sir William cites this in his prophecy.

The use of a motor developed along these lines would represent a yearly saving in fuel expense, covering over 50 per cent of all cars in this country, of around 30 per cent which, in money would represent the staggering total of $286,000,000 of dollars a year in this item alone.

It would show an equivalent saving in oil expense while the value of the time saving in a car which would cover the road at from 20 per cent to 40 per cent faster than our present small cars could scarcely be made the matter of figures.

The performance capacity of a car with such a mtor would be far more in line with recent legislation advocating higher speeds on highways.than is the case with our present small car.

The quicker acceleration would have a pronounced influence on city traffic driving and European small cars, which have been driven in the main traffic arteries of our larger cities have shown a convincing ability to keep well ahead of the line.

Four wheel brakes are standard equipment on the European small cars and would be necessary on an American built product duplicating the speed and power features of the European types.

The higher speed possibilities would necessitate the lowering the weight of the car and this would very likely result in much lower looking car that we have in the small car field at the present time. Such contsrutcion would necessarily influence the amount of road clearance which would probably be taken care of by spring suspension and frame construction.

American car buyers would not take kindly to a car which did not afford them the roominess and seating space which has become associated with our standards of comfort but the use of a standard 56 inch tread on a car with a wheel base which would probably approximate 100 inches should give ample room to afford the same body dimensions we have been accustomed to.

A car motored with the European type power plant would necessarily require a standard sliding gear transmission to get the full flexibility of the engine in general use.

It is a well known fact that American engineers have been studying the European small car for some time and it has been expected throughout the industry that this study would soon make itself felt in material changes in certain phases of construction.

Lighter weight, smaller piston displacements, increased power developments have been presented in steady progression but as yet we have not had anything radical in the way of change as has been predicted in the article by Sir William Lotts.

If such a change is made, it will not be in the nature of an experiment for it is safe to assume that the American maker who would tackle the problem would take advantage of proved construction and would go after the field with mass production. Such a maker would find a ready acceptance of a car with American comfort advantages combined with European performance advantages, not alone in the domestic field but in foreign production as well and British and French makers have already sounded the warning that manufacturers in this country are likely to invade the foreign market with a car of this type.

MOTOR FATALITIES INCREASE SLIGHTLY

(Continued from page 1.)

accidents during March was Louisville, Ky.

No motor vehicle fatalities were reported last month in the following cities with a population of more than 100,000 and less than 300,000: Cambridge, Mass.; Duluth, Minn.; Erie, Pa.; Fall River, Mass.; Fort Wayne, Ind.; Lynn, Mass.; Grand Rapids, Mich.; Lewell, Mass.; New Bedford, Mass.; Providence, R. I.; Springfield, Mass., and Worcester, Mass.

Accident reports were received from twenty-three cities under 100,000 population, which stated there were no automobile fatalities in March. Thirteen of these cities have had no motor vehicle deaths this year.

Fewer pedestrians were victims last month, the reports showing that only 64 per cent were pedestrians and 38 per cent of the pedestrians were under 15 years of age, against the February figures showing 74 per cent, as pedestrians and only 17 per cent, being less than 15 years old.

Forty-eight cities, with a population of almost 15,000,000, reported 111 other public accident fatalities, 48 of these being traffic accidents other than motor vehicles; 12 resulting from drowning and 25 from accidents of a miscellaneous nature.

Reports were received from ninety-two cities and four states New York, Massachusetts, Rhode Island and Connecticut.

Bend—Oiling begins on The Dalles-California highway.

ENGINE BURIED IN SEA, GOOD AS EVER

Star Power Plant After Two Month's Salt Bath, Proves Efficiency

LONG BEACH, Cal., May 8.—It takes more than a two month's salt water bath to stop the performance of a Star car "Million Dollar Motor," according to the results of a performance test staged between here and San Diego. The motor, taken from the bottom of San Francisco bay some time ago, was mounted in the chassis of a French motor car by Eddie Miller, former speedway racing driver, who drove his own creation on an economy and endurance test a few days ago. At sustained speeds of better than 35 miles an hour in a driving rainstorm, Miller came through the test with flying colors and overaged better than 25 miles per gallon of gasoline. The Star car motor was one formerly used in a commercial delivery job by a San Francisco merchant.

SPEEDERS HALTED BY ROAD MAGNETS

Automatic Device Slows Auto to Safe Gait at Grade Crossings

A novel and fascinating idea came to Charles Alder of Baltimore, Md., one evening not long ago, as he sat by his laboratory window and watched the twinkling lights of commuters' trains flashing by in the railroad yards below. He contrasted their orderly operation with the helter-skelter rush of home-going automobiles on the road that crossed the railroad tracks at the end of the yard.

"Why not," he thought, "apply a little signal engineering to the problem of preventing auto accidents at grade crossings? surely there must be some way to keep the reckless driver from committin suicide whether he wants to or not."

Adler set to work to solve the problem. As a result he has invented a sytem that automatically slows down the fast-driven car as it approaches the railroad crossing. No matter how hard the driver steps on the throttle, the car will not travel at a speed greater than fifteen miles an hour until it has passed the crossing.

The device, described in the June Popular Science Monthly, consists essentially of a powerful magnet concealed in a concrete box beneath the surface of the roadway at the proper distance from the railroad crosing. As the approaching car passes over a magnet, the latter operates a system of relays and a governor so designed that it will allow current to flow through the automobile ignition system at spedes below fifteen miles an hour but cuts it off when the car is traveling faster than that rate.

This action continues until another road magnet at the danger point is reached, when the ignition circuit is restored to its normal path. The road magnets are made up of flat strips of magnetized steel, placed side by side in the concrete beneath the road surface.

This remarkable invention may help to solve other important traffic problems besides that o fthe railroad grade crossing. Controlling magnets could be placed at any point where slow and careful operation of automobiles is necessary for the public safety.

MARKETS ABROAD TO DEMAND ATTENTION

Export Trade Is Declared Important Factor for Business Leaders

Export trade is no longer incidental to American business but is an important factor in industry, according to H. H. Rice, a director of the National Automobile Chamber of Commerce, addressing the National Foreign Trade Council at Charleston, S. C., April 29.

Foreign trade at one time, Mr. Rice pointed out, was largely a side line with many factories in most industries of this country. It was welcome extra business but it was not an outstanding feature of the business.

In the automobile industry 12 per cent of the production of the factories is now shipped abroad with the expectation that this percentage will increase rapidly.

More and more it is expected that the United States will be manufacturing products for foregin markets, especially those products which can be made more economically here. Forward looking executives, accordingly, will be paying particular attention to the export field in the next few years.

Carload automobile shipments from the main plants have greatly exceeded previous records during the last two months. In February a new figure was established, with 60,604 carloads and this was far outstripped in March when 74,256 carloads were shipped on the rails. Driveaways have not kept pace with the rail shipping, the February figure being 43,889 machines while March was 58,295 The record driveaway month was during the car shortage period of May 1920, when 74,286 machines were driven over the roads through lack of railroad facilities and freight car supply; that month carload shipments by rail were 21,977.

SANDLESS GLASS IS DECLARED SUCCESS

Laboratory Tests Now Being Conducted in Cornell; Rare Element Used

ITHACA, N. Y., May 8.—Sandless glass is being made in the chemistry laboratory at Cornell University.

The substitute for sand in the process of manufacture is the dioxide of germanium, a rare, mysterious and costly element which Professor L. M. Dennis, head of the department of chemistry, is now able to produce in quantity after years of experimentation.

Whether the new glass has properties that will make it of great value for optical purposes is still undetermined, but the results thus far obtained indicate that it has unusual refractive qualities.

Chemists are still puzzled by germanium. They frankly admit that until it was put to work making glass they had not known what to do with it. Even now they are confident it has other more important uses to which science some day will apply it. At present Professor Dennis is studying its compounds iwth a view of determining whether the element has medicinal properties that will make it of inestimable value to mankind.

Germanium is extracted from crude zinc oxide. In crystalline form it is a glossy, flaky sustance resembling zinc, hard and extremely brittle. It is worth many dollars a gram, and Cornell exhibits the largest mass of the element ever assembled, a round piece, beautifully crystalline about the size of a silver dollar and weighing 104 grams.

It has been learned that crude zinc oxide can be heated with strong acid under such conditions that a volatile compound of germanium of high purity distills over. This is decomposed by water so as to produce pure germanium oxide, a white powder. Professor Dennis further discovered that ingots of the pure metal could be obtained by fusion of the powder under ordinary salt.

Laboratory tests disclosed that a gram of germanium could be extracted from a pound of zinc, and the production has since proceeded on this basis.