masonry dam. It has since been carried out by Mr. Deacon solely, as engineer-in-chief.

It has been constructed at Vyrnwy under conditions very similar to those of the Furens reservoir, in France, and of the Karakvasla dam, near Poonah, in India, constructed by General Fife, R.E. The rock bar crossing the lower end of the valley was laid bare by an excavation 1,100 feet long, 120 feet wide, and from 40 to 60 feet below the surface, removing the alluvial deposit of that thickness and the loose bowlders, while the sloping rocks were benched or stepped to make a thoroughly solid foundation for the masonry. The river was diverted, and the building was then begun. The stone of which the dam is built was taken from a quarry about a mile distant, to the north. This stone, like that of the foundation, belongs to the rock strata of the Lower Silurian system. It is a hard, durable, dark gray stone, weighing 2·06 tons per cubic yard, and having a specific gravity of about 2·721. Stones weighing 10 tons were the largest size allowed to be built into the work, but the average weights were: Stones under 2 tons, 45·99 per cent; stones from 2 to 4 tons, 20·86 per cent; stones 4 tons and upward, 33·15 per cent. The lower beds of these stones, if not perfectly flat, were roughly dressed to a plane surface, and any overhanging pieces or undue projections were cut off. They were then washed by jets of water under the pressure of a 140 foot head.

The stone was too hard for pick work; hammer and chisel, or hammer and set, were, therefore, almost exclusively used. When brought to the dam by locomotives and wagons running on a 3 foot gauge railway, they were lifted into position by steam cranes and deposited on a bed of Portland cement mortar. The interstices between the large stones, when important enough, were then built up with smaller ones, around which cement concrete was rammed. On the finished surfaces so obtained fine Portland cement mortar was again spread, in which other similar stones were set and beaten down with heavy malls. No grouting of any kind was allowed, the necessary intimate mixture and density being obtained by ramming. The cement mortar was at first made with cleanly washed sharp river sand, in the proportion of two parts of sand to one of cement. This was afterward abandoned for a mortar made of one part of pulverized rock mixed with two parts of clean river sand, and of this two parts were mixed with one part of cement. From this pulverized stone, sand, and cement a stronger mortar was obtained than from sand and cement only; the mixture also was quite free from "shortness." As the wall was raised the proportion of cement was somewhat diminished.

After Mr. Hawksley retired from the joint engineership, and in consequence of certain statements that he had made, the Liverpool Corporation instituted a scientific inquiry into the stability of the structure and the quality of the materials employed. One of those who then examined it was General Sir Andrew Clark, R.E., then Inspector-General of Fortifications. In the course of the inquiry a vertical shaft was sunk and a heading driven into the heart of the dam. Eleven large blocks of the concrete filling were removed. When tested by Professor Unwin, F.R.S., and Mr. Kirkaldy, they were found to bear, before crushing, an average load of 300 tons per square foot. The masonry was found to be of the highest character, both as to the concrete filling and mortar bedding. Of the cement, the average tensile strength was 6½ cwt. per square inch. Sir Andrew Clark said of this masonry that "nothing short of an earthquake could possibly disturb it."

The total length of this huge masonry dam across the mouth of the valley is 1,172 feet; its greatest thickness at the base is 120 feet; its height, from the lowest part of the foundation to the parapet of the carriage road on the top, is 161 feet, and from the bed of the river or lake, 101 feet; the height from the bed of the lake to the sill for the overflow of water is 84 feet, which will thus be the maximum depth of the lake. The dam has a "batter," or slope, above the level of the ground, to the degree of 1 in 1·5 on the lake side and 1 in 7·27 on the outer side. The total quantity of masonry in this dam is 260,000 cubic yards, weighing 509,700 tons. The illustration is a view of the outer side of the dam, from a sketch taken by our special artist, Mr. W. Simpson, in the autumn of last year, before the rising of the water in the lake, and while the building of arches on the summit, of which there are thirty-three, elliptical in form, with spans of 25 feet, was still in progress. These arches now support a viaduct for the carriage road, 19 feet wide, and two side pathways; also two finely proportioned towers, containing shafts and apparatus controlling the valves in the two tunnels through the dam below, to regulate the compensation discharge of water from the lake to the river Vyrnwy. From the valley below the lake the outer side of the whole structure appears complete, and these two tunnels are seen with the streams of water flowing from them down the valley. Each aperture is 15 feet in diameter; but at present both have been filled up with brickwork and cement, to allow the lake above to fill with water, leaving only, in the center of each tunnel, an iron pipe governed by two valves with the apparatus in the towers, to regulate the outflow of compensation water to the river.

The discharge water to be conveyed by the aqueduct to Liverpool will pass from the lake by a tunnel, and will be first strained through very fine copper wire gauze in the "Vyrnwy Tower."

The Vyrnwy Tower, some three-quarters of a mile distant from the dam, is a very graceful structure, standing in 50 feet depth of water, 140 feet from the shore. The total height of the tower is 160 feet; the outside diameter at the base is 47 feet, which tapers slightly toward the top. The inside diameter is 30 feet 6 inches. The outer casing is of the same gray masonry as the dam, and the inside is built of cement concrete. This tower serves two purposes: it is the point at which the water is drawn from the lake, and serves to supply the aqueduct from near the surface of the lake, whatever may be the level; and within it also all the water is strained clear of suspended organic matter and impurities before it is sent on its course to Liverpool.—*Illustrated London News.*

THE TORPEDO BOAT STILETTO.

BY GEORGE F. W. HOLMAN, LIEUT. U. S. N.

The Stiletto, illustrated in this issue, built at Bristol, R. I., by the Herreshoff Manufacturing Company, was launched February 25, 1885, and was purchased by the government in the summer of 1888 for use as a torpedo boat.

She is a high pressure, single screw, wooden vessel of 31·8 tons displacement to the load water line, 90 feet long between perpendiculars, 94 feet long over all, of 11 feet beam, of 8 feet depth from level of sheer plank, and of 2 feet 10 inches draught.

In her construction lightness is combined with strength. The framing is of white oak, the keel being in two lengths, scarfed and bolted together; the garboards are side-bolted to the keel; and the frames, spaced 15 inches, and extending from the gunwale to the keel, are securely bolted to the latter and to the garboards; plank floors extend across the keel, to which and to the frames they are bolted; the frames are strung together by a thick strake 2 feet above the water line, a top strake, and a gutter strake lapping over the top strake and the ends of the deck beams; the stem and the stern post are of white oak siding. The hull is strapped diagonally with iron straps to prevent working and twisting, those in the wake of the engine room and fire room being of extra strength, and crossing in opposite directions. These straps are outside the frames and inside the planking. The deck beams, of oak, are fastened to the frames by malleable iron knees, lightened by holes and bolted through. The side planking is in two thicknesses, butts and seams breaking joints. The inner planks are of white pine, the outer of yellow pine from garboards to the thick strake and of white pine above them. The deck planking is in two thicknesses of white pine. The seams are not calked, but a layer of white lead is placed between the two thicknesses.

The boat is divided by five bulkheads into six watertight compartments. The collision bulkhead is 7½ feet abaft the forward perpendicular. The anchor chain stows in the compartment formed by this bulkhead. The second compartment, 24 feet long, contains the officers' cabin and state-room and the steering gear; the third, 18½ feet in length, is the boiler room; the fourth, 11 feet long, is the engine room; the fifth, 24 feet from bulkhead to bulkhead, contains the galley and the quarters for the crew; and the sixth, 5 feet long, is a store room.

The second compartment is entered through the conning tower, the third, fourth, and fifth by hatchways, and the sixth through a manhole. The fire room hatch cover is fitted with a spring catch, and this, as well as the other covers, can be opened from above or below, and egress is easy in case of accident.

The interior receives light in the daytime through the hatches and through fifteen dead lights on each side. Oil lamps are used at night.

The conning tower, about 4 feet in diameter, rises 2¾ feet above the deck, and has glazed slits for an all-round view. From a platform within, the helmsman has conveniently at hand the steering handles, the apparatus for signaling to the engine room, and the whistle lever.

The boat can be steered by hand or by steam. In the fire room, on the starboard side, is a steam steering cylinder, with a stroke of 24 inches. To its piston are connected two piston rods—a forward and an after one—traveling through stuffing boxes in the cylinder heads. The piston, with its rods, forms, virtually, a part of the starboard wheel rope, the after rod being connected by steel wire rope to the rudder yoke and the forward rod, by wire rope and chain, passing around a fair-leader, to a transverse rack forward of the steering wheel. The port end of the rack is connected, by chain and wire rope passing around a fair-leader, to the port end of the rudder yoke. The steering wheel is attached to a horizontal spindle, the forward end of which bears a small geared wheel. The spindle can be pushed slightly forward or pulled aft in its bearings, and can be locked in either position by a small drop pawl. When pushed forward, its geared wheel engages with the teeth of the rack, and, when aft, it engages with multiplying gearing connected with the rack. The latter position, giving more power to the wheel, is habitually used in steering by hand power alone. The spindle has a slight lateral play in its bearings. Its after end is connected by a system of light rods and bent levers with the valve of the steering cylinder, so that whenever the wheel is turned to starboard or to port, the spindle works to one side or the other, and the valve is moved to open the forward or after steam ports of the cylinder. When rotation of the wheel ceases, the spindle resumes its middle position and the valve is centered. Thus, the steam steering gear is always attached, and it is only necessary to turn on steam to the cylinder when it is desired to use it.

The boiler is a Herreshoff patent square tubular, or coil, boiler, 66 inches square outside and 7 feet high, with ten flats of pipes, 58 inches square, the pipes decreasing in diameter from 3½ inches in the first two flats to 1½ inches in the last two, giving a heating surface of 552 square feet on the inside of the pipes. Weight of boiler, 10,343 pounds. The separator, of wrought iron, is 6 feet high and 18 inches in diameter. Under the cabin is a water tank with a capacity for 200 gallons, joined by piping with one under the boiler and firing flat, holding 300 gallons. A steam injector and a Blake steam pump connect these tanks with the boiler.

In the boiler room is a steam ejector for freeing the compartments from water in case of leaks.

Abaft the boiler, and in the same compartment, is the coal bunker, holding seven tons of anthracite.

There is one furnace, with two doors opening aft. Grate surface, 21 square feet. The ashes pass out by a chute through the bottom. The smokestack is jacketed, the space within the jacket forming an efficient ventilator when working with open fire room.

Forced draught is given by a centrifugal fan, 3½ feet in diameter, driven by an independent engine, 3½ inches by 6 inches stroke.

The engines are vertical direct-acting Herreshoff compound condensing engines, with two cylinders acting on cranks at 90°. Diameter of high pressure cylinder, 12 inches; of low pressure cylinder, 21 inches. Stroke, 12 inches. Weight of engines, 4,275 pounds. The cylinders are supported by eight upright steel rods, 1¼ inches in diameter, rising from the bed plate and reenforced by stay rods and braces. The bed is of steel plate, cut for the cranks, and with lighting holes in the middle. The thrust and engine bearings are attached to this bed and the engine is not otherwise secured to the hull, thus reducing the liability to derangement of the engine to a minimum in the event of damage to the hull. Around the top and bottom of the cylinders are lines of ports controlled by ring valves, the valves at top and bottom being connected by stay rods, and the whole being surrounded by the steam chest and jacketed. Each pair of valves is worked by four stems secured to the lower ring at equal distances apart and connected at their lower ends to a crosshead and a Y-shaped rock shaft attached to the link block. Steam is taken from the center of the valve, and exhausted from the ends. In this engine the cylinder is at all times surrounded by live steam, and is, therefore, always kept at the temperature adapted to the most efficient working. The valves are balanced. The clearance is small, and, as steam is admitted all around the cylinder at once, there is but little wire drawing.

The condenser, of copper, is 5 feet long and 2 feet in diameter, over all, and contains 684 tubes. Water is driven through it by an independent centrifugal pump, making 740 revolutions at full speed.

Six pumps are bolted to the bed plate, worked by reciprocating arms attached to a crosshead on each engine: Two air pumps from condenser to hot well, two feed pumps from hot well to boiler, and two force pumps from separator to boiler.

The shaft is of mild steel, 3⅜ inches in diameter, made in two parts, of a total length of 34⅛ feet, and weighing 1,000 pounds.

The screw, of bronze, is four bladed; diameter, 48 inches; pitch, 80 inches; weight, 250 pounds.

The armament, which the boat is now awaiting, will be Howell automobile torpedoes for attack, and for defense a Hotchkiss revolving cannon, hand grenades, and small arms.

It was originally contemplated to fit the boat with two bow tubes for ejecting the torpedoes ahead, directly in line with keel, but this plan is abandoned in favor of the better one of having a torpedo gun mounted forward, on deck, and capable of train so that torpedoes may be discharged in any direction comprehended within an arc considerably in excess of 180°. The gun and torpedoes are now being made at Providence by the Hotchkiss Ordnance Company.

The enviable distinction belongs to the Stiletto of having made, first, the highest recorded speed for a boat (*a*) of her length and (*b*) of her displacement, over a measured nautical mile course, and, second, the highest recorded speed for a three hour trial for a boat of her displacement carrying a load (in coal, water, crew, anchors and gear, and dead weight representing armament) of one-third of that displacement.

Her best recorded run over the measured nautical mile was made in 2 m. 35·2 sec., or at the rate of 23·195 knots, equal to 26·709 statute miles per hour. During this run the pressure in the boiler was 164·5 pounds, intermedial 36·5 pounds, vacuum 19 inches (mercury), air pressure in fire room 3·5 inches (water), horse power, estimated, 560.

During a three hour continuous run at full power she made 59 nautical miles, giving an average of 19¾ knots, equal to 22·646 statute miles per hour. While this run was in progress, time was taken twice over the measured nautical mile course, no notice being given to engineers or firemen, nor any attempt made to spurt the boat, and she was found, from the mean of the two observations, to be making 19·616 knots. Average number of revolutions for the three hours, 388 per minute. Horse power, estimated, 380.

In her contests in speed with other boats she has won a high reputation, trying the issue unhesitatingly with others much superior in size. Her two most notable races have been, one in June, 1885, with the Mary Powell, and the other in July of the same year as a contestant in the American Yacht Club regatta. In the former race, without being pushed to the utmost, she beat the famous Queen of the Hudson by 6 minutes in a run from the foot of West 23d Street to Tarrytown. In the latter race, being entered with the Atalanta, Radha, Cramps, "246," Utowana, and seven others, she made the run from Larchmont to New London in 4 h. 13 m. 31 sec., beating her chief rival, the Atalanta, by 40 m. 19 sec., but not securing the prize, the judges deciding that she had not rounded the buoy at the finish, a fatal technical deficiency, but one of no material consequence whatever as regards the distance or time.

Since her acquisition by the government she has, of course, been entered in no races, but various runs made over the measured mile under varying conditions of load and steam show that she has suffered no diminution of power. She bids fair to live a long and useful life. In her present solitary condition she serves excellently as an instructional boat for officers and seamen. Accompanied by sisters, valuable practice in flotilla evolutions would be possible in peace, and in war the naval contingent, that right arm of our coast defense, would be so much the more muscular. First class or sea-going torpedo boats should compose our flotilla of the future, capable of operating in all weathers and with a large radius of action. Second class boats, among which the subject of this article is rated, are of chief value in defense of harbors and of inclosed waters, and will be able to serve, in other than very stormy weather, in operations extending to about two hundred miles from the coast.

Five tons of coal will drive the Stiletto 112 knots at a speed of 18 knots per hour, and 515 knots at a speed of 11 knots per hour. Each ton of coal additional will increase the mean draught ¾ inch and will add about 20 knots to the former distance and 100 knots to the latter.

In a rough sea test, to ascertain the strength of the boat and its qualities in heavy weather, remarkably good behavior was manifested. The boat rolled but little when put in the trough of the sea and, steaming head on, spray alone came aboard, no solid water being shipped. The distance run was 41·17 knots and it was made in 2 h. 23 m. 41 sec. giving an average of 17·31 knots, equal to 19·93 statute miles per hour.

Our illustrations give, Fig. 1, a view on deck looking forward; Fig. 2, the interior of the conning tower; Fig. 3, a view on deck looking aft; Fig. 4, the after part of the quarters for the crew; Fig. 5, the boat as seen from astern; Fig. 6, the helmsman at his post and the officers' stateroom; Fig. 7, the engine room; Fig. 8, the boiler room; Fig. 9, the galley; and Fig. 10, a broadside view of the boat.

The Stiletto, aside from the beauty of her model and the wonderful record achieved, and beyond the admiration evoked by the striking originality of her component parts, to the harmonious working of which her success is due, excites particular interest from the fact that she is the first torpedo boat designed for the use of automobile torpedoes ever owned by the United States.

The government has, up to a recent date, relied mainly on spar torpedoes for use in torpedo warfare. Nearly all our monitors, a few of our tugs, and all of our ships, from the close of the civil war to the beginning of the present era of "the new navy," have been fitted with them, and each ship has been and still continues to be furnished with at least one steam launch provided with means for operating them.

With the exception of these launches, we have owned but few torpedo boats, properly so designated, and of these few but one, prior to the acquisition of the Stiletto, has been distinguished for speed. The first, a plunging torpedo boat, built from the designs of a Frenchman at an early period of the civil war, attained a speed, under sixteen oar power, of 2½ knots. Her torpedo, affixed to the hull of an enemy by a man in a diving suit emerging from the interior of the boat, was to explode, after an interval, through the action of clock work contained within it. This boat, an utter failure, foundered at sea. The next was the Spuyten Duyvil, built toward the close of the civil war, carrying an under-water spar ahead. Speed low. She is no longer on the navy list. The Intrepid, built in 1874, was the third, fitted at first with a submerged spar and later with towing torpedoes and with ordinary above-water spars on either beam. Speed between 10 and 11 knots. Proving a failure as a torpedo vessel, she is now being converted to a light draught gunboat. In 1874 was also built the torpedo ram Alarm, carrying a spar torpedo ahead and one on either beam. Speed 11 knots. She is now in ordinary at New York. In 1875 the Lightning was built by the Herreshoff Manufacturing Company for the Bureau of Ordnance. This boat attained a speed of 20½ statute miles, equal to 17⅞ knots, a record which has never been equaled by any boat of her length, 58 ft. She is now hauled up at the torpedo station, worn out in service.

The high efficiency realized by the Lightning and the Stiletto gives cause for belief that a new and larger steel torpedo boat, now building by the Herreshoff Manufacturing Company, under contract with the government, will yield results which will do this enterprising firm credit when the time for her trial arrives. It is to be hoped that other boats may follow soon and that, while other nations are building by dozens and by scores, our government may see the wisdom of increasing these valuable adjuncts of the naval force more rapidly than by occasional units.

Flying Fish.

At a recent meeting of the Physiological Society, Berlin, Prof. Moebius spoke on the movements of the flying fish through the air. He first described, from personal observation, the way in which the fish shoot out of the water from both bows of the ship, and then propel themselves horizontally for a distance of several ship's lengths with their pectoral and abdominal fins stretched out flat, skimming along without moving their fins, always in the direction of the wind, but either with or against the same. When they meet the crest of a wave they raise themselves slightly in the air, falling again to the same extent in the succeeding trough of the sea. Occasionally a slight buzzing of the fins may be observed, similar to that of the movements of the wings in many insects. At night they frequently fall on the deck of the ship.

As a result of a detailed investigation, the speaker had proved that these fish do not fly, since the anatomical arrangements of their fins and muscles are not adapted to this purpose. What really occurs is that when frightened by the approach of a ship or any enemy they shoot up out of the water, as do so many other fish, and are then carried along by the wind, which strikes on the under surface of their outstretched and evenly balanced fins. Notwithstanding the general acceptance which was accorded to the above investigation, it was urged by many that the buzzing of the fins, the rising over the crest of a wave, and the falling overboard after having landed on the deck of a ship, were evidences that this fish really executes movements which result in flight. In reply to this, the speaker pointed out that the buzzing of the fins takes place when a strong current of air is directed against the outspread fins of a dead flying fish by means of a bellows, and further, that the rising over the crest of a wave or the bulwarks of a ship may be explained by the ascending currents of air which are always produced whenever a strong horizontal wind strikes against any elevated object, such as a wave or part of a ship. Thus, finally, with the exception of the movements involved in its oblique sudden exit from the sea, all the motions of a flying fish when in the air are really passive.

Explosive Silver and Iodine Compounds.

An imperfect argentine fulminate, although one of a violently explosive character, is prepared by digesting recently precipitated oxide of silver in ammonia for twelve hours, then pouring off the liquid and cautiously drying the black powder in the air, having previously divided it into small portions. This is a most violent explosive, but not quite so much so as some crystals which are obtained from the ammoniacal liquid that was decanted. This liquid, after being gently heated, deposits, on cooling, small crystals which will scarcely bear touching, even while under the liquid. A modification of this consists in dissolving chloride of silver in ammonia, adding caustic potash in fragments, and when effervescence ceases decanting the fluid portion and washing and drying the powder. These were known as Berthollet's fulminating silver, although they are not now considered to be a true fulminate of silver, being simply oxide of silver and ammonia.

The true fulminate is formed by adding alcohol to a warm solution of acid nitrate of silver. We give a formula for its preparation on the principle upon which sunken rocks are marked on the mariner's chart, viz., as something to be avoided when experimenting with chemicals in everyday use. Pour one ounce of alcohol over one hundred grains of powdered nitrate of silver, and add an ounce of nitric acid. When the nitrate assumes a white, cloudy appearance, cold water is added to suspend the ebullition, and the powder is collected on a filter and divided into small portions. This is Brugnatelli's method; but those of Fownes and Liebig differ from it in no important respect. For example, the latter dissolves one part of metallic silver in ten parts of nitric acid, and then pours the solution into twenty-three parts of alcohol. This is heated to the boiling point, and is set aside to cool, when the fulminate is deposited in white, lustrous, acicular crystals, the weight of which, after being washed, equals that of the silver originally employed.

From the foregoing it will be seen how near to the wind photographers may sail without running foul of this most deadly compound, which only a few years ago was stated to be the most dangerous substance for which we are indebted to modern chemistry. It is certainly still the most dangerous of those cognate to photography, not excepting the iodide of nitrogen, a substance which at one time was recommended as giving a remarkable degree of sensitiveness when employed in photography. Indeed, in the earlier times, even the fulminates, not only of silver, but of the other metals, were suggested as being likely to possess marvelous sensitive-conferring properties. Friction or percussion are stated as means whereby the explosion of fulminating silver is effected, but such friction and percussion need be only very slight indeed—a touch of a feather and the fall of a drop of water upon the compound have been known to do the mischief.

We have alluded to iodide of nitrogen. We feel it to be a duty to refer to the fatal facility with which this substance can be formed. A few crystals of iodine placed in a capsule, with enough ammonia poured over it to effect its solution—and that is all. The compound arising from this simple mixture is the deadly ter-iodide of nitrogen. Such a mixture has been recommended, and is employed by many, for removing pyro stains from the fingers. When used aright, it is quite harmless, the condition of safety being found in there being an excess of the iodine. This solution was stated by the late Rev. J. B. Reade, F.R.S., at that time president of the Royal Microscopic Society, to form an agent in dissolving gold under circumstances valuable and interesting to microscopists. A drop is placed upon a microscopic slide, and a bit of gold leaf is laid thereon; this dissolves and forms beautiful tree and shrub like growths of bright gold.

When photographers feel it incumbent on them to use iodide of nitrogen, they ought to take special care not to allow it to be placed aside where it will dry and crystallize, as in this form it cannot bear to be touched. Even the very act of throwing it away may lead to its exploding ere it is projected into the waste.—*British Journal of Photography.*

334 Rounds in 27 Seconds.

Some interesting experiments were made recently near Dartford with the Maxim Nordenfelt quick-firing and automatic guns. The first weapon fired was the Maxim automatic gun of 0·45 caliber, and with this 334 rounds were fired in twenty-seven seconds. A comparative test was then made between ordinary rifle powder and the new Maxim smokeless powder. A cartridge containing 85 grains of black powder and others containing 55 grains of the new powder were fired. The last mentioned cartridges gave a slightly greater velocity, and at the same time produced extremely little smoke. Among the other guns tried was an automatic six pounder, which has a dropping block like the Sharpe's rifle. It requires only two men to work it, one firing and the other loading. Everything about the gun is fixed save the gun itself, which is placed inside a jacket, which latter is also fixed. There can be no danger of escape of gas or from a hang fire. The gun on being fired recoils about 4½ inches, and then returns to its original position. The cartridge case is not ejected till the gun has traveled some little distance on its return journey. The act of putting in the new cartridge pushes forward the ejectors and releases the block, which rises and closes the breech. If great rapidity is required, one man on a saddle with a butt to his shoulder aims and fires, while a man on each side puts in the cartridges. If only one gunner is left unkilled, a single man can work the gun in the following manner: Having laid the gun and fixed the trigger in a firing position by a bit of wood or string, he simply puts in cartridge after cartridge, the gun on each occasion going off as the cartridge is pushed forward. It can be fired, with two men to load, sixty times a minute.

Ingenious Mode of Advertising.

The agents for a certain kind of cough candy distribute circulars on which is stated the following puzzle: "What number can you take, and when you divide it by two, three, four, five or six you will have one over, but when divided by seven nothing will remain?" The circular goes on to say that if a person cannot solve the puzzle he should buy a box of the candy, when the agent will hand him the right number on a slip of paper. The methods of advertising are not yet all exhausted.