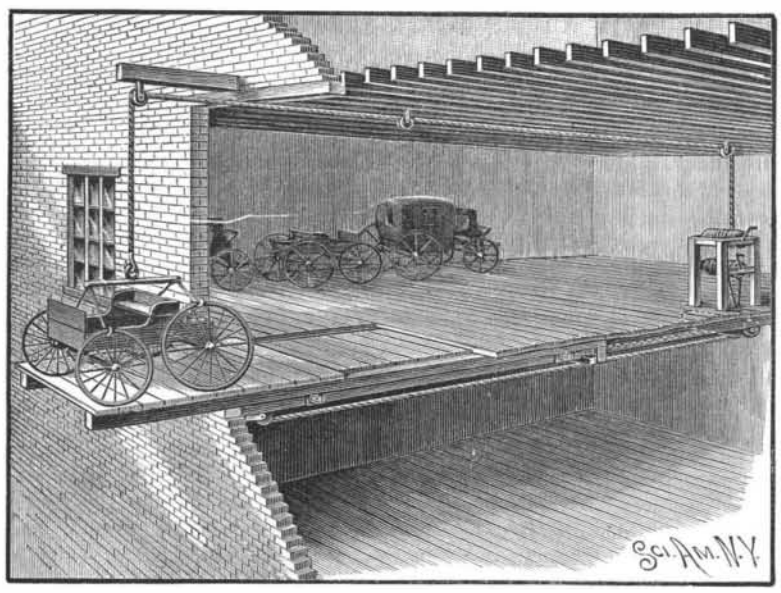
AN ELEVATOR FOR HOISTING CARRIAGES.

A mechanism for hoisting vehicles, etc., outside of buildings, to land them upon an upper floor with facility, while saving the space that would be required within the building for a hatch or inclined way, is illustrated herewith and has been patented by Mr. George L. Loomis, of Northampton, Mass. A platform having a surface large enough to hold a carriage is adapted to be projected between the jambs of a door and beyond the wall of a building on the second or a higher floor, the platform being secured upon a frame consisting of two beams extending from the outer end of the platform inward between the joists. These beams have their inner ends united by a cross piece extending beneath two or more joists, and rest upon friction rolls journaled in the joists, whereby the beams can be moved over the door sill, or in grooves cut in it, to move the platform out and in. In a line centrally with the frame, and to the rear thereof, is a windlass frame in which is journaled two drums, a cord from the lower drum passing over a pulley secured beneath the door sill, and being made fast to the frame, whereby the latter may be moved in and out, as the drum is rotated in one direction or the other by means of its crank-handle. From the upper drum on the windlass frame, which is provided with the usual pawl and ratchet and crank handle, a cord passes through a hoisting block upon a beam projecting from the building, the outer end of the cord being provided with a sling upon which the vehicle to be raised or lowered can be readily secured. The platform when retracted is adapted to pass over the floor proper, leaving, when extended, a surface over which things may be easily and safely moved.



LOOMIS' CARRIAGE ELEVATOR.

THE BUTTING VIPER.

Although Africa contains no Crotalus nor Bothrops nor Trigonocephalus, she is, in return, the country of vipers, for, with the exception of a few species that inhabit Europe and Asia, all the rest are peculiar to that country. The butting viper (*Vipera arietans*), which forms the subject of this article, is found throughout entire Africa, with the exception of the Mediterranean region, and is met with especially along the coasts of the southwest as far as to the Cape. Two huge specimens of this species have just reached the reptile menagerie of the Paris Museum from Senegal. The body of this serpent, which is short, thick, and squat, rarely exceeds four feet in total length. It tapers considerably in the cervical region and terminates in front in a triangular head with rounded angles, somewhat cordiform, much wider than the neck, and very much depressed. The tail is conical and very short. Its thickset form gives the animal a hideous aspect. The nostrils, which are widely open, and their circumference destitute of scales, are very close to each other, and situated directly above the snout, and not at the sides, as in other species of the same genus. This is what led the German naturalist Merrem to group the vipers that present this peculiarity under the generic name of *Echidna*, reserving that of *Vipera* for those in which the nostrils open laterally. Behind, and externally to the nostrils, are the eyes, which are set very close on account of the shortness of the snout.

As in all vipers, the upper jaw is provided on each side and in front with a series of from three to five highly developed, channeled, venomous fangs, which are of unequal size, movable, conical, and bent backward, and which straighten up when the animal opens its mouth. The duct that they contain gives passage to the poison, and opens upon their front edge, near the extremity, in an elongated slit. These fangs are very sharp, and their conical shape permits them to enter tissues in such a way as to gradually separate them without tearing them. When the fang is withdrawn from the wound—a simple puncture—the skin, by virtue of its elasticity, resumes its place and imprisons the inoculated venom, which is almost instantaneously carried by the circulation throughout the entire organism. The entire top of the body, including the head, is covered with carinate scales arranged with great regularity.

The coloration of this viper is very variable. In the museum specimens the dominant color is a light and somewhat tawny brown. This, upon the back, is relieved by a series of darker stripes, open in front, and, for the most part, exhibiting a yellowish border behind. At the lower part of the sides there is likewise a longitudinal row of dark spots, and the top of the head is, at the level of the eyes, traversed by a brown band, which descends on each side to the edge of the upper lip.

Indolent and sluggish to the highest degree, the butting viper usually remains entirely immovable, its body coiled, and the head resting upon one of the coils. The lower figure in the engraving represents it in this state of repose. Its repugnance to motion is such that it allows itself to be approached almost to contact without stirring. It scarcely moves, except to seek food, or to make an attack, or to escape. Then it makes rapid motions, which form a marked contrast with its natural slowness. If it is disturbed, it at once puts itself on guard by drawing back its head, and twisting its neck into the shape of the letter S, ready to untwist it and straighten it like a spring, so as to throw the head forward in order to bite. At the same time, its body is seen to inflate and alternately return upon itself, thus showing its irritation. Sometimes, too, it hisses long and loudly. It has the singular habit (whence is derived its name) of beginning an attack by butting with its head like a ram.

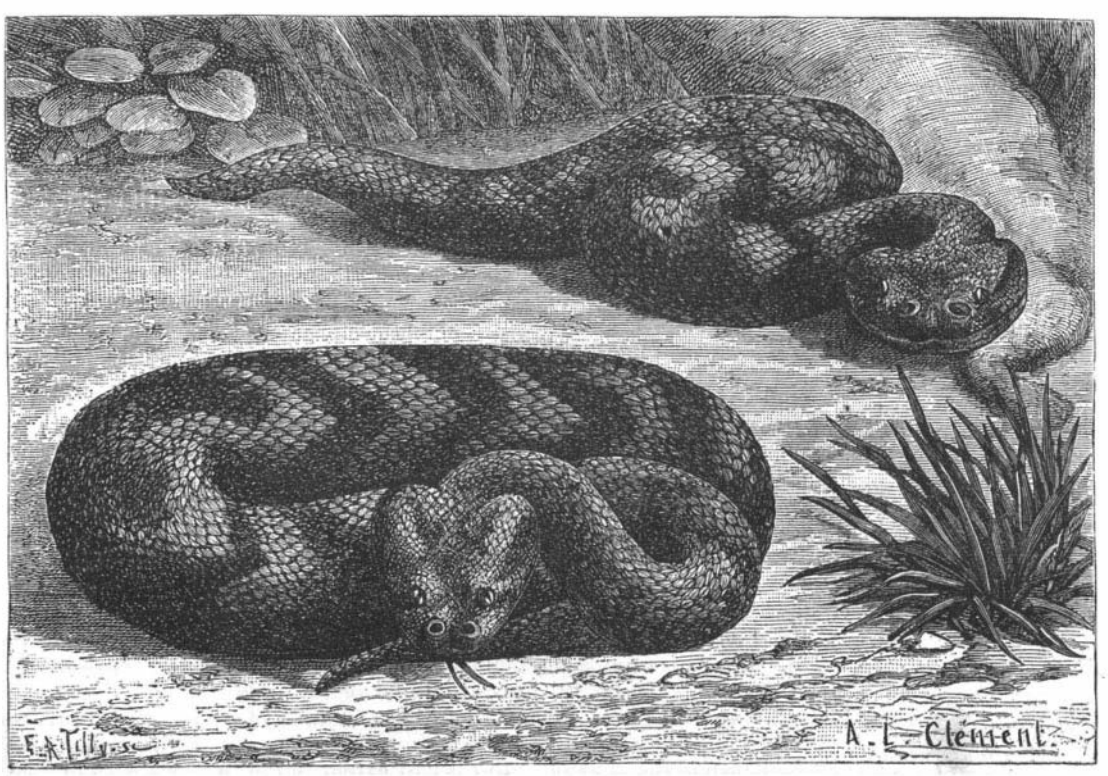
In a state of liberty, small mammals, such as rats, mice, and squirrels, form the habitual food of the butting viper, but it catches birds also. In captivity, it is fed upon rats, and sometimes upon young rabbits, and the very variable intervals that separate two meals is, on an average, twenty-five days.

Exclusively of the slowness with which it decides to attack its victims, its mode of doing so is the same as that of other vipers. Put in the presence of an animal which it is about to make its prey, it immediately twists its neck, as has been described, ready for the attack. Its respiration quickens and becomes deeper, while at the same time it darts out its forked tongue, and at times strikes the animal with its head. Its anger keeps increasing until finally it springs with the quickness of a flash upon its prey, which it pierces with its long, venomous fangs, and which in most cases utters a cry of distress. Then it springs back with the same abruptness and waits, motionless, until the venom has accomplished its work of death. The victim, which at first seems filled with astonishment, soon falls upon its side, as if paralyzed, and, after a few convulsive motions, expires in the space of one or two minutes. The viper then returns to it with a slow, gliding motion, noses the entire body, and finally seizes the latter by the head and swallows it.

From the manner in which these animals attack their victims, one would be tempted to believe that they are conscious of the terrible effects that the inoculation of their venom immediately produces. But such is not the case, for they behave in the same manner when recently killed animals are offered to them, and boas, too, coil around such animals, in order to strangle them, just as if they were living. These acts, which seem due to reason, are instinctive.

The venom of the butting viper cedes in no respect to that of the rattlesnake. Dogs of large size rapidly succumb after being bitten, and cases are cited in which man has been unable to resist its action. It is even asserted that the Hottentots, whose country is infested with these reptiles, use the venom to poison their arrows by mixing it with the juice of certain plants.

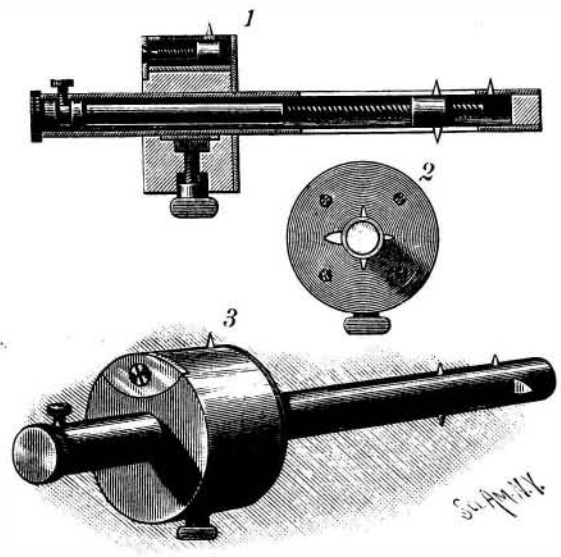
The reptile endures captivity well, provided that the temperature of its cage is sufficiently high. It feeds with considerable regularity, and is easily preserved for several years.—*La Nature.*



THE BUTTING VIPER.

AN IMPROVED GAUGE FOR WOODWORKERS.

A gauge which can be readily adjusted for mortising, cutting, or marking, two or three different widths, or marking one or two widths and cutting another, or for marking a width from the shoulder of a rabbeted or otherwise checked piece of wood at will, is illustrated herewith, and has been patented by Mr. Wm. B. Little, of New York City. On its tubular stock is mounted to slide an adjustable cylindrical fence with a set screw for clamping it in the usual way, and near the outer end of the stock, on one side, is fixed a projecting marking point, a cutting point being fixed somewhat nearer the outer end on the opposite side. On the outside of the stock, angularly midway between these points, is fixed a mortise-marking point, inside of which is a longitudinally adjustable mortise-marking point, riding in a slot in the stock, and projecting from a cylindrical nut sliding within the stock, as shown in the sectional view, Fig. 1. The nut is threaded to work on an internal threaded spindle, the outer end of which has a milled head projecting out of the stock. The stock also carries another directly opposite longitudinal slot, in which rides another marking point also carried by the nut, and adjustable therewith. The fence is closed at its outer end by a metallic face plate, shown in Fig. 2, and at its inner end by a detachable metallic bearing plate, mortised in and attached to the back of the fence, as shown in Fig. 3, and in one side of the fence is a longitudinal tubular guide, in which slides a cylindrical nut carrying a marking point which projects through a slot on the outside



LITTLE'S COMBINATION GAUGE.

of the guide. This point can be readily adjusted to any desired distance from the front of the fence, for use, as usual, in marking a line inside of a checked piece of wood.

For further information in relation to this invention address the inventor, in care of Mr. Thomas Young, of No. 5 Greenwich Avenue, New York City.

Electrical Production of Diamonds.

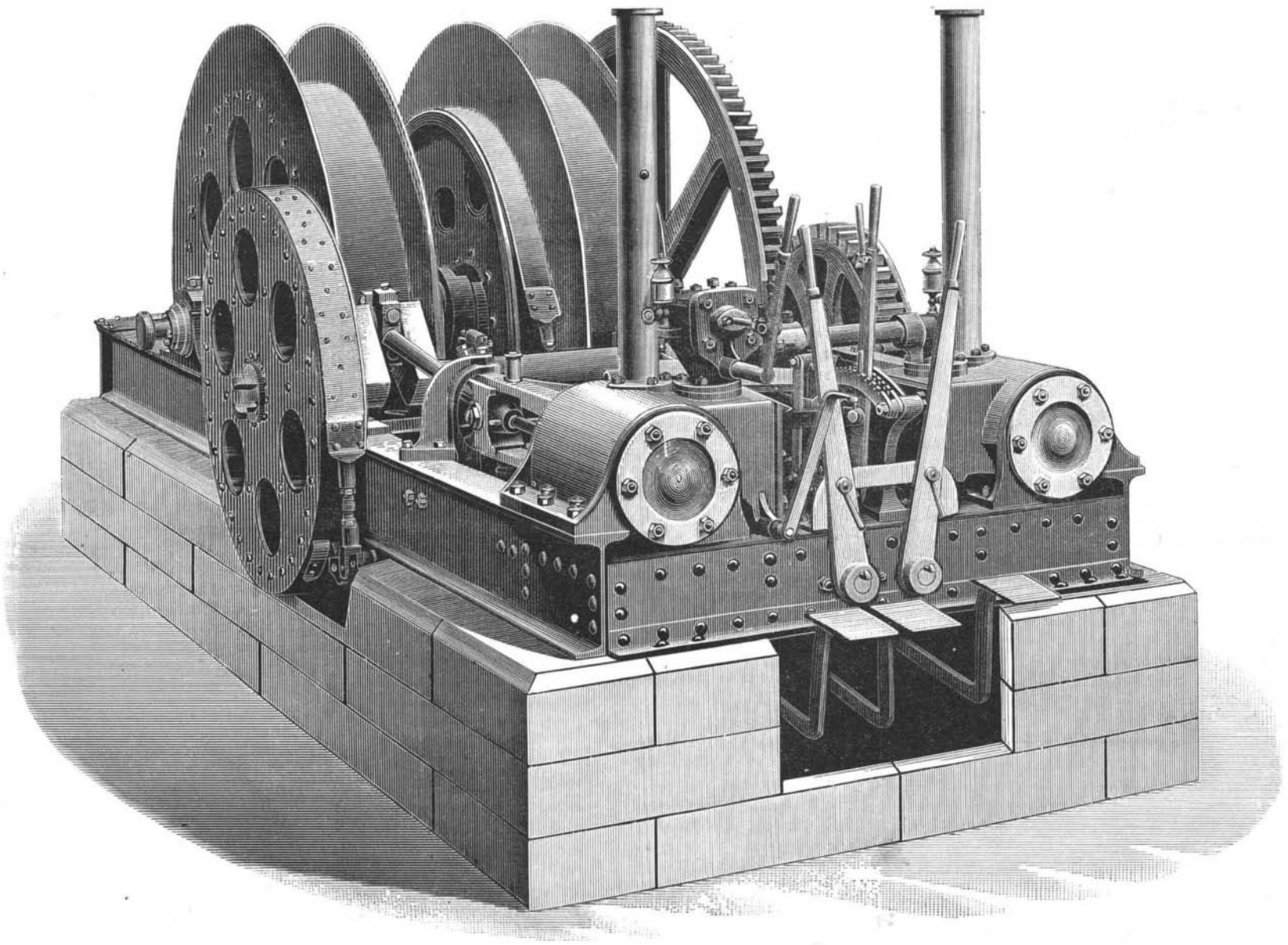
The Hon. C. A. Parsons describes in an interesting communication to the Royal Society, which is published in abstract in *Engineering*, a number of experiments which he has recently made on carbon at high temperatures and under great pressures, and in contact with other substances. The primary object of the experiments was to obtain a dense form of carbon for use in arc and incandescent lamps, for, as it is well known, could the life of the carbons of either variety of lamp be prolonged, a considerable economy could be effected in electric lighting.

Looking at the experiments from this point of view, it may be stated that the experiments were not entirely successful, though a very dense form of carbon was in one case obtained, but nevertheless some results are of very great interest, as, though the author expresses himself very cautiously, it would appear that he has succeeded in producing diamond dust artificially. The arrangement of the experiment was as follows: A massive cylindrical steel mould, of about 3 inches internal diameter and 6 inches high, was placed under a hydraulic press; the bottom of the mould being closed by a spigot and asbestos rubber packing—similar to the gas check in guns. The top was closed by a plunger similarly packed; this packing was perfectly tight at all pressures. In the spigot was a vertically bored hole, into which the bottom end of the carbon rod to be treated fitted. The top end of the carbon rod was connected electrically to the mould by a copper cap, which also helped to support the carbon rod in a central position. The block and spigot were insulated electrically from the mould by asbestos; and the leading wires from the dynamo being connected to the block and mould respectively, the current passed along the carbon rod in the interior of the mould. The free space in the mould was filled in turn with different hydrocarbons and with other materials.

Among the liquids acted on were benzine, paraffine, treacle, chloride and bisulphide of carbon, and the solids included silica, alumina, carbonate and oxide of magnesia and alumina. The pressure employed ranged from five to thirty tons per square inch. In the experiment with silica the density of the carbon was increased 30 per cent, and in no other case. The most interesting set of experiments was when the mould around the rod was filled with a layer of slaked lime about one-fourth inch thick, surmounted by two inches of silver sand, followed by a layer of lime of the same thickness, and finally by a layer of coke dust. The pressures used ranged from five to thirty tons, and the current from two hundred to three hundred amperes, the carbon being in different experiments from one-fourth inch to five-sixteenths inch in diameter. Under these conditions there was obtained on the surface of the carbon rod a powder of a gray color, harder than emery, and capable of scratching the diamond. This powder is, therefore, very probably the diamond itself.

SIXTEEN HORSE POWER WINDING ENGINE.

We illustrate a winding engine exhibited at the recent Nottingham show. This engine is fitted with two large winding drums, each connected to its own shaft by independent clutches, so that either drum can be used quite independently of the others. The frame is made of steel or wrought iron girders, the engine being specially designed for use in countries where skilled labor not being available, repairs are troublesome and costly; in fact, cast iron is nowhere used except in the cylinders and one or two minor brackets. Each drum is fitted with a brake, and there is also one on the flywheel, so that complete control is secured under all circumstances. The cylinders are 9 inches in diameter with 16 inches stroke, and the engine is fitted to carry a working pressure of 100 pounds. The *Engineer*, to which we are indebted for our illustration, says a large number of similar engines is in use in the mining districts of the various colonies. They are thoroughly well made, and calculated to stand a great deal of hard work.



SIXTEEN HORSE POWER WINDING ENGINE.

Trial of a New Torpedo.

The Naval Board of Ordnance, at College Point, N. Y., have been testing recently a torpedo which is the invention of two Americans, Messrs. Geo. E. Haight and Wm. H. Wood, the former of whom is now in France instructing the naval officers of that country in the use of the invention, the French government having bought one for trial.

The board consists of: Capt. A. P. Cook, president; Capt. C F. Goodrich, Lieut.-Comdr. R. B. Bradford, Lieut. A. R. Couden, and Lieut. S. P. Comley.

The torpedo is cigar shape and is united to a float of the same shape, which lies three feet above it, by four knife-edged stanchions. The torpedo projects beyond the float at the bow, and at its stern is a propeller, above which is the rudder. From the stern there trails an electric wire, which connects with a keyboard on shore, or wherever the torpedo station is. Fore and aft on the upper vessel or hull, which is the only one which is seen at all above the water, are two flags, which serve as sights by which to guide it. The upper cigar is 18 inches in diameter and 44 feet long. The lower one is 24 inches in diameter and 40 feet in length, this latter being charged in the head with about 300 to 400 pounds of high explosive, which is fired either by the percussion of the cylinder against the side of the vessel or by an electric current from the shore, as desired.

The lower hull also contains the engines, which are of the 6-cylinder type, and the supply of compressed carbonic acid gas with which they run; also a device by which the gas is heated. The heating of the gas is accomplished by coils of copper pipes incased in cylinders containing sulphuric acid and having lime chambers at each end. The sulphuric acid and the lime may be brought in contact by electricity when desired, and will, in less than a minute, heat the gas up to 600° F., and keep it hot from one to three hours. The engines, each of which takes up only fifteen by twenty-four inches of space, can run 800 turns per minute, at which speed each will develop 75 horse power, the speed of the torpedo being 20 to 24 miles an hour, which speed can be maintained for a run of one to one and a half miles with one charging of gas.

The torpedo is expected to cut through rope netting of inch hemp rope and strike the target fair and square, exploding at once. The entire torpedo, with its propelling and steering machinery and its charge of dynamite, nitro-glycerine, or whatever other explosive is chosen, weighs 2¼ tons, the engine weighing 524 pounds.

For the experiments before the board, the navy yard tug Nina anchored behind a net target 130 feet long, three-quarters of a mile from shore, representing a man-of-war, defended by her torpedo nettings, the explosive charge consisting of a can of powder on top of the forward flag of the torpedo, but fired by the regular cap head of the submarine weapon.

The distance, three-quarters of a mile, was covered in 2 minutes 52 seconds, official time, or at the rate of say 18 miles an hour. Subsequent examination showed that the torpedo cut clean through the netting, broke her forward stanchion in so doing, and then headed away in a go-as-she-pleased trip. The torpedo also snapped her connecting wire.—*Army and Navy Jour.*

M. CHEVREUL has entered his 103d year. The other day he walked through the Sanitary Exhibition, at the Palace of Industry, Paris.