sick girl, and younger than she, stated that on the evening preceding a fly had entered *her* left nostril, and, since in the evening she had begun to experience the same symptoms as those exhibited at first by Josefa, the family began to think that Dr. Lesbini might be right. The trip was therefore resolved upon, and it was decided that Eliza should be one of the party, a decision to which she undoubtedly owes her life. On Saturday, January 18, at ten minutes past twelve the patient took the train. At the station Jesus-Maria she got out and walked around for a moment; this was at about half past one. When the train reached the station General Paz, at ten minutes before three, the patient's state was so much worse that her family was thrown into the greatest inquietude lest she should not arrive alive at her destination. At three o'clock, when the train started, the patient became senseless, and, shortly after leaving the station, she expired in her mother's arms. The corpse, having been taken to the brother's house, was examined by Dr. Lesbini and two of his confreres, who had been at once summoned. The former desired to make an autopsy, but the family was formally opposed to it.

"Dr. Lesbini's diagnosis was fully confirmed by the larvæ which came from the mouth and nasal fossæ of the patient, as well as by the perforation of the palate. There is no doubt, then, that Josefa died from the malady under consideration, *myiasis*, and that it was caused by the larvæ of *Callipho'a anthropophaga*, which probably penetrated the brain and lungs."

After citing a large number of similar cases, Mr. Conil gives a careful study of the larva and perfect state of the dangerous insect.

"Resuming the data which precede," says Mr. Conil, it results that: an egg of the fly deposited on the 15th of January in the nasal fossa of Eliza Ortiz, hatched and had already, four and a half days afterward, attained a length of one-fifth of an inch; the larva had attained its entire growth and had transformed into a pupa eight and a half days after the egg was laid; and, finally, eleven days were sufficient for the pupa to perfect its forms and become transformed into a perfect insect. This makes in all nineteen days and a half for the cycle of its different metamorphoses.

"If we consider the quantity of eggs that each female of the diptera under consideration is capable of laying at one time, we shall be astonished at the relatively small number of cases of myiasis that occur, even taking into account that many cases cannot be ascertained by science and consequently are ignored. That the fly does not multiply to a greater extent, seeing its wonderful fecundity, must be due to the fact that some enemy holds it in check and prevents a multiplication which would be so pernicious to our species. What the enemy is the future will probably tell us; I hope so, at least, and if it is possible, I propose, next summer, to pursue my observations on the diptera, and to apply myself specially to biological observations."

### Michigan Frogs and Frog Hunting.

The marshes between Detroit and Lake St. Clair are the resort of millions of frogs; and it is asserted that more frogs are sold in Detroit than in any other city of its size. During the frog season heavy shipments are made to New York, Boston, and other Eastern cities. The *Free Press*, which pronounces the commercial frog as suspicious as a wolf, as wild as a deer, and as shrewd as a fox, describes the work of frog hunting as follows:

"Most of the frogs are caught for this market by men. One or two boys have some fame as successful frog catchers, but it has been demonstrated that the average boy lacks the necessary qualificatious to make the business of any profit to him. We know of one old fisherman and hunter who has followed the frog catching business for the last twelve years, and he has sometimes made it pay as high as $15 per week. While there is only one way of killing a goose there are several ways of killing a frog. Frog hunting would be a great financial success if the jumpers would take a seat on a log and permit a man to walk up and crack 'em over the head with a club, but the frog is utterly opposed to any such proceeding. His eagle eye detects the enemy afar off, and the approach must be cautious. The outfit consists of a frog spear, a hook and line, a fish pole with a pointed iron in the end, and sometimes a small shotgun is taken along. First discover your frog. He may be sitting on a log ten feet from shore. He feels quite safe at that distance and will probably wait for developments. The hook and line can be used here. The line is stout and the hook big enough to hold a twenty pound bass. The idea is to fish for the frog without bait. A careful hand will maneuver the line until the hook is under the frog's throat, and then a sudden jerk takes him off his meditative roost and gives him into the power of his enemy. The spear, which is provided with a long handle, can sometimes be used, though a frog will dodge a sudden thrust as quick as a pickerel. If the shot gun is used it is with a light charge of powder and very fine shot, and the head is the point aimed at. Some of the froggers work the banks and are provided with boats, but success depends a good deal on circumstances. A good hunter has been known to bag 200 frogs per day, but three or four dozen legs are called a fair day's catch. A frog will probably live ten or fifteen years if steering clear of accidents. They are not worth catching until they are two years old, and are not "prime" until they reach the age of five. A frog sees his palmy days from five to ten. Before reaching five he is giddy and thoughtless. After that he settles down to a life of ease and contentment, and the days come and go and leave him no sorrow. Frogs have been caught in the St. Clair marshes weighing as high as seven pounds and having legs almost like drumsticks. One was caught at the head of Belle Isle two years ago which kicked the beam at nine, and one weighing only half a pound less was on exhibition at the Central Market last spring. Frog hunters say that the game they pursue is a weather bureau in himself. Before a storm he can be found only in certain localities. When there is to be a dry spell he seeks certain other localities. If the day is to be cool and cloudy his altitude betrays it. If it is to be hot and sultry the frog remains below. During a thunderstorm he is "on deck" to witness the display, and is then off his guard to such a degree that he is often killed with a club. His natural enemies are man, several species of birds, three or four species of fish, and one or two kinds of animals, and the fact that he manages to dodge all for years is proof enough that his lack of brains has been more than made good by his supple legs."

### REMOVAL OF FLOOD ROCK, NEW YORK CITY.

The work of mining the seven acres of Hell Gate, known as Flood Rock, which is illustrated on our first page, was planned and barely commenced by Gen. Newton, U. S. Engineers, before his successful explosion of the extensive mine under Hallet's Point Reef, which took place Sept. 24, 1876, a full illustrated account of which appeared in the SCIENTIFIC AMERICAN of October 14, 1876, preceded by an illustrated history of the inception and progress of the work in current numbers of earlier dates. By this important operation there has been secured a clear navigable channel of 26 feet depth at low water, in place of the dangerous and dreaded whirlpool, called by the early Dutch settlers of New York "Horl Gatt," meaning whirl passage, which has become Hell Gate by modern usage. The name is now applied to the area including Flood Rock and other neighboring reefs.

The present work, begun in 1876, was suspended for want of appropriations during the whole of the fiscal year ending June 30, 1878.

Flood Rock is a ledge of gneiss, of about the same composition as Hallet's Point Reef, located about 1,000 feet northwesterly from Hallet's Point, at Astoria, L. I., where the machinery plant for mining that reef was located.

The summit of Flood Rock, as seen in the engraving, formerly appeared at all times above water. Its form was such that, by building upon it suitable retaining walls and cribs, an area of about a quarter of an acre was prepared for the necessary buildings and a hoisting tower at the opening of the shaft, which has been sunk from the apex of the ledge to a depth of about 75 feet, as shown in the section of the mine in our engraving.

The rock, as it was removed, was at first deposited by dumping scows in a deep hole off Ninety-second street, till it was filled to a desirable level. It is now being deposited between Little and Great Mill Rocks, an interval of about 800 feet, which with the rocks will form the western side or breakwater to the new channel formed by the removal of Flood Rock. This was included in Gen. Newton's original project for the improvement of Hell Gate.

A network of galleries, to plan of which is shown in the engraving, now extends under nearly five acres of Flood Rock. When the excavation is completed, piers only of sufficient size and in ample number to support the roof will remain.

The piers are then to be drilled, charged with sufficient explosives to break them down, and then fired simultaneously, when the whole mined area of the river bottom, shown by the fine cross lines now known as Flood Rock, is expected to sink into the mine, and after dredging, form a new channel of 26 feet depth at mean low water.

The amount of explosive to be employed was originally estimated at an equivalent of 100,000 pounds of nitro-glycerine.

The amount used at the former explosion at Hallet's Point was 52,000 pounds of explosive placed in 172 piers. The mine was fired by the touch of a child's hand, and Hallet's Reef was no more. There have since been dredged from this demolished reef a total of 72,084,078 gross tons of refuse, and only a few shoal points now remain, mostly near the shore.

The galleries thus far completed at Flood Rock have a total length of 13,528·08 lineal feet, from which 39,608·38 cubic feet of rock, measured in the original solid form, have been removed.

At the present rate of progress the mining will be completed about the close of 1883.

The machinery by means of which this important work is carried on is of the most approved types of modern mining appliances, and as much as possible of the labor is performed by steam, the prime motive agent. There are four large boilers, three of the horizontal two-flue type, 6 feet diameter by 24 feet long, set in brick, and externally fired, and one of the fire-box tubular or locomotive type. They have an aggregate of 140 square feet of fire grates, equal, at maximum rate of combustion with natural draught, to about 400 horse power.

The steam is maintained at 60 pounds constantly, but in a part only of this system of boilers, one or more being at all times available for cleaning and repairs. They furnish steam to the following engines and heating pipes: Five upright air compressors, steam cylinders, 9" by 18", which supply air to the small drilling engines (30 in all, a part only in use all the time), air pressure of 55 pounds per square inch; one double winding engine, having two cylinders 16"x24" geared to a 7-foot winding drum by spur gearing about 1 to 7, which raises and dumps automatically into scows all the mined rock; one upright ventilating engine cylinder, 12"x18", driving a fan 12 feet diameter; one small upright shop engine driving the machine shop and four smiths' fires; and one small double-cylinder freight hoister.

There are two ten-inch Worthington duplex mining pumps, one of which at about 75 to 80 strokes per minute, serves to drain the mines in the present condition of the leaks.

There are also three boiler feed-pumps and a special Knowles circulating pump, 8-inch water piston.

The drying chamber in the main gallery is also supplied with steam for the purpose of drying the clothing of the workmen.

The exhaust steam from all these engines is condensed in a large Lighthall surface condenser, and about two-thirds of the original feed water is returned in a purified condition and at about 100° F. to the boilers; when new and unusual leaks are developed by the blasts the second pump is used till they can be plugged by the miners, the parts thus plugged must be then approached from another direction.

The water is all taken to the pump well below the central gallery, through drains cut below the general floor level of the mine, thus leaving the gallery floors comfortably dry for the workmen.

There are now about 200 men, comprising miners, mechanics, and laborers, engaged on this work, in three shifts or watches of eight hours each, using from 20 to 30 drilling engines, which are driven by compressed air distributed from the five compressing engines through a large main, and smaller branch air pipes to the headings where each air-drilling engine has its separate flexible pipe.

Holes something over two inches diameter are now being made, each about four feet deep, at the rate of 31·72 feet per shift, by each active drill.

The blasting is done at night; the explosive used is No. 2 extra giant powder; as many as 300 holes have been fired (charges about one pound weight) in a single night, and then the ventilating fan, located at the top of the shaft, is run at its maximum rate, displacing about 50,000 cubic feet of air per minute.

Careful and experienced pioneers explore the galleries after each blast and test the walls and roof, and remove all loose rocks before the drillers and mining laborers return to work where blasting has been going on.

The detached rock is loaded upon small cars on 2½-foot gauge tracks and drawn to the shaft by mules, a number of which are stabled permanently in a chamber set apart for their use.

The cars are run upon a tilting cradle, which is pivoted upon the sill of the hoisting cage, and firmly secured to the cradles so that they may be safely dumped into the iron-clad chute at the top of the hoist-way, whence the rocks slide into the dumping scow alongside. The descending empty car counterbalances an equivalent weight of the ascending load in the adjoining lift, thus practically eliminating the cost of hoisting the cars as dead weight. The loaded scows are taken by a powerful tugboat to the dumping ground, the present state of which requires unloading upon dump cars upon the dike, as it is shown, nearly filling the space between Little and Great Mill Rocks, indicated in the engraving.

The history of the Hallet's Point mine, which may be found fully illustrated in the SCIENTIFIC AMERICAN of August 21, 1875, Sept. 30 and Oct. 14, 1876, shows the comparative cost of hand and machine drilling by compressed air to be 95 cents per foot for the former, and 36 to 37 cents for the latter.

The distribution of the whole cost of mining was then as follows:

| | | |
|---|---|---|
| Drilling and blasting | 46·00 | per centum. |
| Transporting in the mine | 17·00 | " |
| Hoisting | 3·28 | " |
| Dumping | 2·03 | " |
| Pumping | 10·37 | " |
| Incidentals, including costs of superintendence | 21·32 | " |
| | 100·00 | |

The disposal of the rock from the new mine, which involves the use of a tugboat and dumping scows, modifies the distribution of the cost, making the item of dumping 7·17 per cent., while the incidental item which includes cost of superintendence is reduced to 10·4, or less than half that in the old work.

The works at Flood Rock are in charge of Gen. John Newton, U. S. A.

### Imitation Amber.

Considerable quantities of beautiful objects of artificial amber are now being produced in Vienna. The substance employed in its manufacture is chiefly colophony or resin, obtained by decomposition of turpentine, though several other ingredients are used to give it the requisite qualities. The imitation is said to be perfect, and the production has even the electric properties of amber. Ingenious manufacturers have even introduced into the substance foreign bodies, insects, etc., to make the similarity more striking. Natural amber requires a temperature of 285 to 287 degrees C. to fuse it, while the imitation becomes liquid at a much lower temperature.

### A Fatal Torpedo Explosion at Newport.

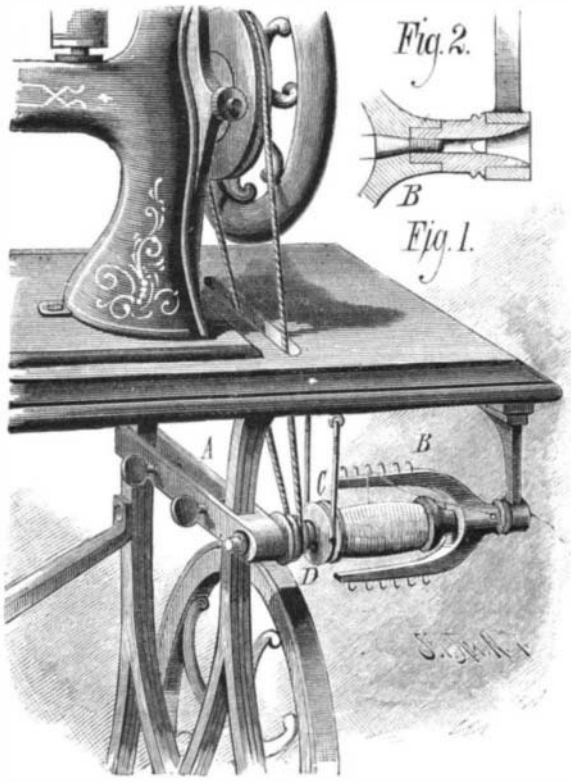
Recently two officers of the torpedo school at Newport, R. I., Lieutenant Commander Edes and Lieutenant Spaulding, were killed by the untimely explosion of a torpedo which they were placing in the harbor. According to the official report of Captain Thomas Selfridge, in charge of the torpedo station, the deceased officers were carrying out a torpedo in a small boat, when it exploded. The class had been previously instructed in all the details of the operation, and a diagram drawn that each one could see how the wires should lead, and special cautions had been given by the instructor, Lieutenant Commander Bradford. The torpedo was first to be planted. Then, of the two wires, one was to be connected to a circuit closing buoy, and the other to a firing circuit on shore. They had been cautioned not to make these connections after the torpedo was dropped until they had come ashore. As a further precaution, the wire connecting the firing battery with the torpedo in the electrical building was also disconnected, making three breaks, any one of which would make it impossible to fire the torpedo. It seems that the first torpedo planted by these officers became leaky, and in taking it up they cut the wires of the old torpedo without breaking the shore connections. In planting the new torpedo, being in a hurry, they pulled out and took up the wires from the water and connected it (the torpedo), supposing the connection in the electrical building was broken. It appears that Lieutenant Commander Caldwell, supposing, as should have been the case, that the connections of the torpedo were broken, joined this connection in the electrical building. The terrible result followed.

### SPINNING ATTACHMENT FOR SEWING MACHINES.

The engraving represents a very simple spinning device, which can readily be attached to a sewing machine, and replaces the cumbersome spinning wheel generally used with hand machines for spinning. Fig. 1 is a perspective view of the device applied to a sewing machine, and Fig. 2 is a sectional view of the outer journal of the spindle.

A clamp, A, is secured to the leg of the sewing machine by thumb screws, and supports the spindle, C, flier, B, and the spool. The end of the spindle is furnished with a hollow flaring mouth.

To fit the attachment for operation the clamp, A, is to be attached to the legs beneath the table and directly over the driving wheel, with the spindle projecting in a horizontal direction, with space enough for the flier to clear the table. The bracket which supports the outer end of the spindle is then to be screwed into the table directly over and in line with the mouthpiece of the spindle. A tension band is passed around the grooved pulley of spool and secured to the table. The object of this band is to prevent the spool from turning as fast as the flier, and it can be made to turn as fast as required for taking up the thread by tightening or slackening the band by means of screws. The driving band is passed around the driving wheel of the sewing machine and around the cone pulley, D.




BLACKETT'S SPINNING ATTACHMENT FOR SEWING MACHINES.

This attachment will readily do all the work of the ordinary spinning wheels much faster, and it is much easier to work than spinning wheels. The attachment saves the necessity of having a spinning wheel where there is a sewing machine in use.

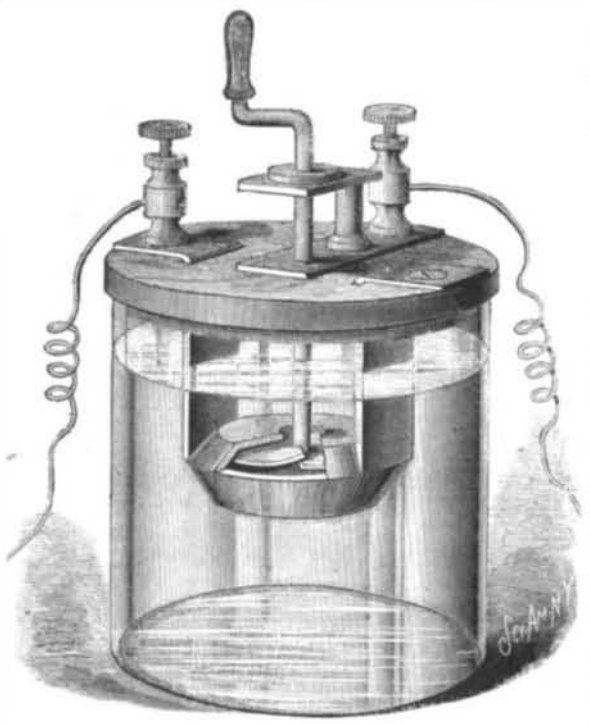
In many parts of the country a spinning wheel is just as much a necessity in every family as a sewing machine; but with this attachment to the sewing machine the large wheel will not be required.

For preparing yarn for crochet work and knitting the spinning and twisting attachment is especially useful.

This invention was recently patented by Mr. J. C. Blackett. All communications in regard to the invention should be addressed to Mr. J. R. Blackett, Caledonia Mines, Cape Breton, Nova Scotia.

### AN IMPROVED BATTERY.

The engraving shows an improved galvanic battery lately patented by Mr. A. Floyd Delafield, of New York city. This battery is provided with means for increasing the strength of the current by producing a more or less rapid circulation of the solution in contact with the elements by mechanical means, operated by hand or by a motor. This is accomplished practically by fitting the negative element upon a shaft for revolution between the zinc plates, and for increasing the effect the revolving disk is made in spiral form, something like a screw propeller, so that it creates a circulation of solution in the cell, thus continuously depolarizing the elements.



DELAFIELD'S GALVANIC BATTERY.

### Pictet's New Steamer.

The Geneva correspondent of the London *Times* gives the following details concerning Professor Raoul Pictet's model steamer, which he expects to drive at the rate of 40 miles an hour:

Her dimensions are 16 meters long and 3·50 meters wide. When lying at anchor she will draw 33 centimeters fore and 44 centimeters aft; at full speed, 1 centimeter forward and 16 centimeters aft. The engine will be placed amidships, from which point to the stern the screw shaft and the keel form an inclined plane; the bows are long, tapering, and wedge-shaped. Professor Pictet reckons that his invention will lead to a great saving of fuel, inasmuch as a steamer built on his plan, after being started with, say, 100 horse power, maybe kept up full speed with an expenditure of force equal to 30 horses. The form of the hull, on which the maintenance of the ship's equilibrium will depend, cannot be explained without a diagram. Professor Pictet is quite confident in the success of his invention, and his scientific previous achievements have been so remarkable that many people who cannot follow his reasoning have no hesitation in accepting his conclusions.

### The Improvement of the Mississippi River.

The construction committee of the Mississippi River Commission, consisting of General Q. A. Gillmore, Major C. R. Suter, and Mr. B. M. Harrod, has for several months past been holding monthly meetings in St. Louis for the purpose of hastening the preparation of the outfit required for a vigorous prosecution of work under the appropriation of $1,000,000 made at the last session of Congress, all of which will be expended on the river below the mouth of the Ohio. As bad navigation on that portion of the river is invariably due to excessive widths produced by caving banks in concave bends, the first thing to be done is to stop this caving by suitable works of bank protection, such as a brush mattress weighted with stone or some other species of revetment or covering extending down from the crest of the bank into deep water. The next step will be to narrow the stream to such widths between the high river banks that the current, with the increased velocity produced by the narrowing, will scour out and maintain, even during the low river stages, the depths required for navigation. This will be done by contracting the stream, usually at points opposite the concave bends, through the agency of light, permeable dikes, placed either longitudinally or transversely to the shore, or both. These dikes, composed of brush hurdles, or of wire and brush screens, or some similar device, will allow the water to pass through them with more or less freedom, and, by checking without arresting the current, will convert large areas next the shore into stilling or settling basins, within which the river itself is expected, during the flood stage, to build up new banks and establish new and advanced shore lines by constantly depositing the solid matter which it transports, but which the unimpeded flow would carry down to the Gulf of Mexico. Works of this general character will be begun as soon as the working plant is ready upon nearly seventy miles in length of the worst navigation below Cairo, namely, about forty miles on the Plum Point stretch, above Memphis, and thirty miles in the vicinity of Lake Providence, above Vicksburg. Nothing will be done upon the levees. It is expected that work will begin about October 1.

### The National Telephone Exchange Association.

The third semi-annual convention of this association was held in Saratoga, the second week in September. There were present at the first session 250 delegates, of whom 100 represented telephone companies. Among the prominent delegates were:

G. L. Wiley, assistant general superintendent of the Metropolitan Telephone and Telegraph Company; W. A. Childs and Francis Shaw, of the Law Telegraph Company; Henry W. Pope, of the Staten Island Telephone Company; Henry Metzger, general manager of the Pittsburg Telephone Company; William Sargent, the general superintendent and electrician of the Bell Telephone Company, of Philadelphia; Mr. Goodyear, representing L. Tillottson. C. B. Hotchkiss, John A. Roebling, Washburn & Moen, and other firms were represented. Among the subjects for discussion were these: The latest improvements in all the instruments used; underground wires; wire construction and kinds of wires; also a report on electrical disturbances interfering with the telephone service.

### IMPROVEMENT IN TELEPHONES.

The engraving shows an improved telephone transmitter and receiver recently patented by Mr. J. A. Lakin, of Westfield, Mass. This instrument is especially intended for mills, railroad offices, and other places wherein much local noise disturbs the successful operation of the common telephone now in general use. This instrument consists of a square box, in which are placed both a transmitting and a receiving diaphragm. From the receiving diaphragm chamber two sound tubes extend to be received one in each ear. They are kept in place by a small spiral spring, tending to draw the tubes together, and thus keep the small rubber caps on the ends of the sound tubes in place in the ear. These caps shut out all extraneous sounds and confine the sounds of the receiving telephone, so that their full effect is felt on the ear.

The lower part of the box, as seen in the drawing, contains the transmitter, which is made very sensitive. It is claimed that this instrument will talk two hundred miles or more.

Pressing the button, as shown in the cut, brings the battery into circuit with the transmitter. The inventor of this instrument has given much time and study to the construction of telephones, beginning as early as 1869, although, as he informs us, most of his attention has been given to acoustics.


LAKIN'S TRANSMITTING AND RECEIVING ELECTRIC TELEPHONE.

For further information address J. A. Lakin, Westfield, Mass.

### NEW INVENTIONS.

Mr. Henry Grabach, of Clyde, O., has patented an improvement in the manufacture of boots and shoes, which consists in securing the counter stiffener to the shortened lining by a line of stitches around its edge, the lining of heel portion terminating at the edge connection, so that the friction of the heel of the foot comes upon the stiffener and a portion of the usual lining is saved.

Mr. John Murray, of New York city, has patented a toy savings bank for children, so constructed as to connect amusement with the operation of depositing money in the banks. The invention consists in a toy savings bank having a slotted base with a money receiving compartment at its rear