New Inventions.

Submarine Telegraph Between America and Norway.

The Augsburger *Allgemiene Zeitung* contains the terms of an agreement concluded on the 24th of last January between an American company, represented by Mr. T. P. Schaffner, and the Swedish Government, relative to the laying of a submarine telegraph between the coasts of North America and those of Norway.

The telegraph company is permitted to lay a line of wires between the coasts of America and Norway, as well as to construct a telegraph station on the latter. On the other hand, however, the desired permission will not be granted to build a telegraph line through Norway. The Norwegian government will make arrangements that the telegraph line now in course of construction by the State from the frontiers of Sweden along the coasts of Norway as far as Mandal, shall be made to form a junction with the submarine line at a point to be selected between Stavanger and Mandal. The extension of a Norwegian line to a point further north than Stavanger, should such be chosen, may be the subject of further agreement. The Norwegian government further reserves to itself to determine all the details, both with regard to the construction of the line and of the station, and as to the conditions under which despatches either from or to America may be transmitted through Norway over the State lines now existing.

The foregoing concessions are made on the express condition that the Company should possess the necessary means for the execution of the undertaking within five years from the date of the agreement, and further that within five years next ensuing, the entire line be completely finished.

These privileges are granted for one hundred years; but we believe the line will never be laid down. The right of laying down a line from the North American shore as part of the line to Ireland has already been secured by a company in this city.

New Rock Drill.

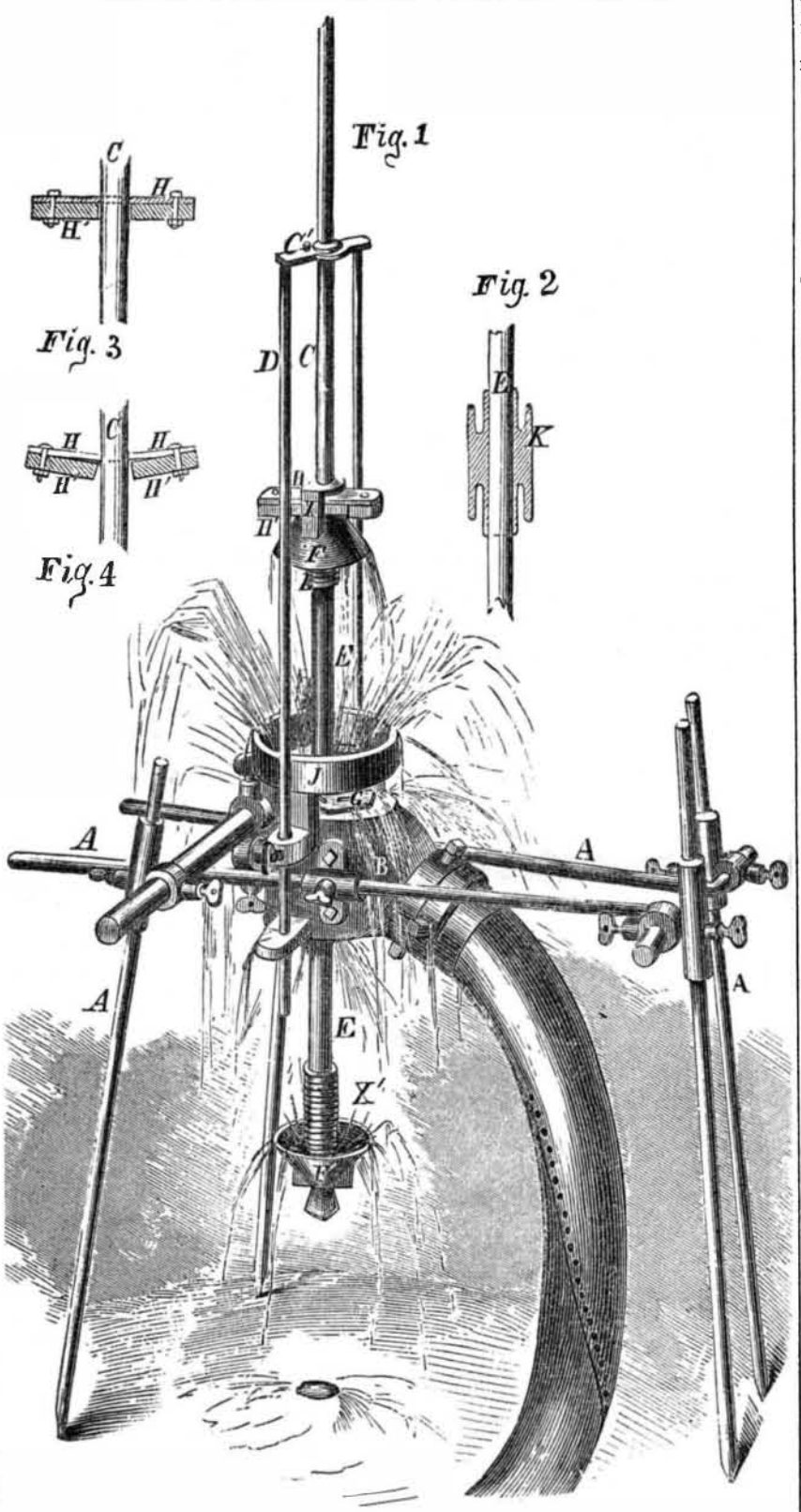
The rough, uneven, inaccessible situations of quarries, excavations, and other localities where rock drilling is generally required, together with the necessity of frequent changes of the drills from spot to spot, precludes the employment of cumbersome machinery, or the application of power by any of the ordinary methods.

To overcome these difficulties and furnish a cheap, powerful, and convenient substitute for hand drilling, is a problem that has long engaged the attention of inventors. The author of the improvement herewith presented believes that he has realized the great desideratum. He employs the power of water to operate the drill, the liquid being conducted to the machine through a common leather hose pipe. The flexibility of this conduit is such that it may be laid almost any where; for the roughness and unequalities of quarry places, tunnels, mines, &c., it seems to be admirably adapted.

The drilling apparatus, which is very simple, is supported on a frame, A, the various parts thereof being rendered adjustable by means of thumb screws, so as to be easily changed to suit the nature of the ground. B is a valve box, which receives the water from the hose pipe. C is the drill, the upper end being guided by passing through the yoke piece, C'; the latter is supported by the adjustable rods, D. The middle portion of the drill passes through a tube or sleeve, E, the upper and lower ends of which are furnished with conical cups, F F'. Openings indicated at G are made through the top and also through the bottom of the valve box, B; these openings are fitted with a valve, see fig. 2, so arranged that when the drill falls and the upper cup, F, is brought close down over the perture, G, the spring, L, pushes down valve K, which opens the apertures, G, and the water instantly spirts up with great power, strikes the inside of the cup, F, and lifts the drill; when the lower cup, F', reaches the underside of the box, B, the spring, L, comes in contact with the lower shank of valve, K, and pushes it up, which movement shifts the upper openings, G, and opens those below, whereupon the force of the water is thrown into the lower cup, F, and the drill is driven down. The drill is thus made to play up and down with great rapidity and power. H is a spring steel clamp placed in a yoke, I, immediately above cup F. The clamp is furnished below with jaw pieces, H' H', (see figs. 3 and 4,) which firmly grasp the drill. When the drill falls the extremities of H come in contact with the ring, J; the momentum of the drill causes H to spring a little, and to curve for the moment, as seen in fig. 4; jaws H, consequently, open slightly, and the drill thus has a chance to slip through tube, E, far enough to complete its cut; the jaws then seize the drill again, as firmly as before, the release and seizure being, of course, almost instantaneous. In this manner the drill follows the depth of the hole as fast as cut, while the lifting and thrusting operation regularly proceeds.

The drill is partially rotated at each stroke by means of feathers placed within cup, F; the water acts against the feathers and imparts the requisite rotation. The water, as fast as it operates the drill, gushes from the machine and falls upon the ground, filling up

IMPROVED HYDRAULIC ROCK DRILL.



the hole and washing away the debris as fast as formed therein. One man, we are told, can attend to two or three of these machines.

The machine is strong and extremely simple in all its parts. It will work on a horizontal thrust or at an angle, as well as perpendicularly. The flexibility of the hose pipe and the lightness of the machine renders it convenient for handling, change, or removal. Where the head of water is too low a pump driven by the water may be employed to force up water enough to drive the drill; in some localities a steam engine may be employed to drive the pump, the water being used over and several drills kept simultaneously in motion.

If desirable this machine may be applied to the dressing of stone, for which purpose one end of the drill should be furnished with a proper formed cutting tool; a valve would also be necessary, with which to regulate the force of the water. If a powerful quartz crusher is wanted the bottom of the drill may be furnished with a pestle, and a mortar placed below; in this manner the requisite rotatory motion of the pestle would be secured at any velocity, without gearing and at slight expense.

At the great Fair of the American Institute last fall, Crystal Palace, N. Y., this drill was exhibited in full operation, and attracted great attention. With an inlet water opening of only 2 1-2 inches and a head of 50 feet the apparatus made an average of 120 blows per minute, the stroke of drill being 17 inches, weight of drill 20 lbs., weight of machine 35 lbs.; it out a hole in very hard stone 1 3-8 inch. in diameter, at the rate of one inch depth per minute. So admirable were the performances of the invention that a gold medal—the highest prize of the Institute—was awarded to the inventor.

This improvement is the invention of Mr. Josephus Echols, Columbus, Ga., of whom further information may be obtained. Patented March 25, 1856.

Writing Inks.

Good writing ink is something of great importance. It is employed to convey ideas, and make records of the deepest significance, both in the literary and mercantile world. Vast quantities of it are used, and its manufacture and sale employ many persons and a considerable amount of capital. The qualities of good writing ink should be, a deep rich color permancy, an easy flow from the pen, non-liability to injure pens or paper, and freedom from sedimentary action. We have lately used some ink obtained from Messrs. More, Clark & Co., Dayton, Ohio, which, when first written with, is of a green color, but it soon becomes a fine black, and gives evidence of permanency. It flows freely from the pen, and possesses the quality of remaining free from sediment in the bottles.

We have also used some of the ink made by Thaddeus Davids & Co., manufacturers of ink in this city, which is also of a green color when written with, but soon becomes of a deep jet shade. It also possesses the quality of easy flow from the pen, limpidness, and durability. A piece of paper was written upon with this ink and exposed to sun and rain on the roof of a building from May 9, 1855, to August 1st,—about three months; this severe test scarcely changed its shade. For permanent records, this ink of Davids & Co., appears to be the very kind so much wanted at present, as the more common inks become very faint in a few years.

Expensive Books.

In our last week's issue, on page 240, it was stated that it had cost the U. S. Government one and a quarter millions of dollars, to prepare and publish the account of Lieutenant Wilkes' Antartic Expedition. The information was derived from statements made in a debate in the U. S. Senate, on printing. Since then an explanation has been made by Senator Clayton, which puts quite a different face on the matter. The sum stated was for the whole cost of the Expedition.

Nitrate of Silver for Burns.

J. Wiltbank, M. D., in a communication to the *Medical Examiner*, Philadelphia, states that he has used nitrate of silver in solution as an excellent application for burns and scalds. He states that its results have gratefully surprised him. "It furnishes a complete protection to the inflamed surface, subdues the pain, arrests the serous discharge, changes the character of the inflammation, and promotes a speedy cure." From twenty to forty grains are dissolved in an ounce of water, and this is applied with a camel's hair pencil over the whole surface of the burn.

The Metals.

The ancients knew but seven metals—gold silver, iron, copper, mercury, lead, and tin. Antimony was first discovered by Basil Valentine, in 1490, and that by accident, while following his alchemical pursuits. Bismuth and zinc in 1530; while from 1733 to the present period there have been found no less than forty-nine new metals, by chemical research. These are known to be distinct in identity and characteristics from each other.

Gone West.

Hon. C. Mason, Commissioner of Patents has gone on a tour to Iowa. Will be absent about a month.

The Perpetual Motion.

Willis' "perpetual motion," exhibited in his city some weeks since, and illustrated in our paper, is, we are informed by one who knows, propelled by compressed air.

Coal in Turkey.

The coal mines of Kosloo, in Turkey, which were worked last year by an English company, yielded 43,000 tuns.