

**The Coast Survey.**

Though hampered by lack of means, the U. S. Coast Survey is steadily prosecuting a very important work. The extension of the triangulation from the coast inland, begun by Peirce, is going on under Superintendent Patterson in twenty-five States.

The Mississippi River has been surveyed as far up as Memphis, nearly nine hundred miles above its mouth. Important surveys and explorations have been made in far-off Alaska; soundings across Behrings Strait have developed a remarkable ridge extending between Asia and America—a circumstance hitherto unknown. The new surveys of the James and the Delaware are nearly completed, and the entire Gulf of Mexico sounded and mapped from the Mississippi to Yucatan and from the Bahamas to the coast of Mexico. To the present superintendent belongs also the "Coast Pilot," a directory of the Atlantic and Gulf coasts, long urgently needed by seamen. Although Bache had some idea of a publication of this kind it never took shape in his mind, and he left behind him only a few vague and disconnected notes of little practical value. Patterson conceived and put into execution the unique and elaborate plan which is now being carried out, and which will when completed form the most complete series of coast directories ever published by any nation.

This plan proposes the publication of (1) a very complete description of coasts, bays, and rivers, as far as the head of navigation—a carefully prepared itinerary, in fact—giving in plain language detailed information on every possible question of interest to mariners—this to be issued in a series of five large volumes, illustrated with valuable views and charts; (2) a more condensed series in three volumes, embracing the same extent of coast but with less detail; (3) a single "handy volume," containing sailing directions for the whole coast from Maine to Texas. A work of a similar character is likewise to be prepared for the Pacific coast.

Meanwhile the topographical and hydrographic work is being rapidly executed—the latter being now almost entirely performed by officers of the navy, who, since the close of the war, have become once more available for marine surveying. In short, but few years can elapse ere the whole of the Atlantic coast and that of the Gulf of Mexico will show an unbroken border of surveyed topography and hydrography extending from Passamaquoddy to the Rio Grande.

**NOVEL MACHINE FOR DEMAGNETIZING WATCHES.**

With the extensive use of dynamo-electric machines there arises a difficulty which is experienced by almost every one who comes into proximity to one of these machines; that is, the magnetization of one's watch so that its time-keeping qualities are seriously interfered with, or it stops altogether. Several methods of demagnetizing watches have been proposed, some of which operate with a certain degree of success, but all are more or less troublesome and uncertain.

Mr. H. S. Maxim, the well known mechanical and electrical engineer of this city, has lately perfected a piece of apparatus which is exceedingly simple and perfect in its action, and it may be used not only on watches and other small machinery affected by magnetism, but also on tools of any form or size.

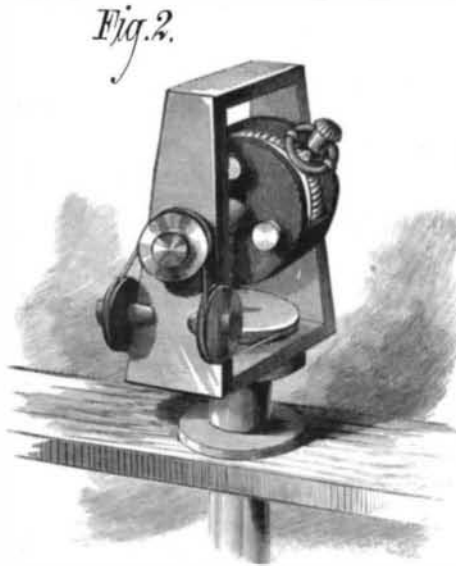
The device consists of a bar electro-magnet, mounted on a vertical spindle so as to revolve endwise in a horizontal plane. It receives a current from a dynamo-electric machine or galvanic battery, which is transmitted to the magnet wires through springs bearing on the insulated collars above and below the magnet, these

collars being connected with the terminals of the magnet wire. The frame supporting the magnet spindle is attached to the end of a bed piece having on its upper surface ways for the carriage supporting the watch. This carriage is moved along on the bed piece by a screw having at one end a crank and at the other end a bevel wheel which meshes into a pinion on the magnet spindle.

The watch holder is mounted on a hollow vertical spindle opposite the poles of the magnet, and takes motion from the screw through a bevel wheel fixed to its lower end, and driven

by a pinion carried by the carriage but rotated by the screw, the screw being slotted and the pinion being splined for that purpose. The watch holder is supported by a frame attached to the end of the hollow vertical spindle, and a small wheel is supported inside of the watch holder frame by a fixed shaft running downward through the hollow spindle and attached to the lower portion of the carriage.

The chuck in which the watch is placed is revolved by a



ENLARGED VIEW OF WATCH HOLDER.

belt passing over a pulley on the end of its shaft, under guide pulleys and around the fixed wheel, so that as the watch holder frame is revolved in a horizontal plane the watch is revolved in an ever-changing vertical plane.

The operation of demagnetizing a watch is very easy. The watch is placed in the holder, and the carriage is moved up as near the electro-magnet as possible. The shear nut on the carriage is then brought into engagement with the screw, and the magnet is rotated rapidly, the watch at the same time receiving a compound rotary motion which brings every side of the watch in opposition to the poles of the magnet. The electrical circuit is thus completed through the magnet by means of the switch at the side of the bed piece, and the rotary motion is continued until the carriage has reached the end of the screw remote from the magnet, when the electrical circuit is broken and the work is completely done. It was our good fortune to witness this operation on a watch that was so thoroughly magnetized as to be incapable of making a single stroke of the escapement lever. When it was taken out of the machine its motion was perfectly free and normal, and the most delicate tests failed to reveal a trace of magnetism.

The theory of the action of this machine seems to be that the watch is subjected to rapid reversals of polarity in a

**Improvements in New York Harbors.**

The annual report of General Newton to the chief of engineers, just submitted, describes at length the progress made last year in the improvement of navigable channels about New York. The most important operations were at Hell Gate. At Hallett's Point there has been continuous work in grappling and removing the debris from the explosion of 1876. During the last fiscal year (ending June 30, 1881) there have been removed 9,823 tons of broken stone. The total amount of stone removed from this reef since the explosion is 81,907 tons. The full depth of 26 feet at mean low water has been obtained for the area embracing about two-thirds of the reef. Over the remaining one-third there are still shoal points having 19 to 20 feet over them at mean low water.

The work at Flood Rock has also been carried on without interruption. The length of galleries driven during the year was 6,211 lineal feet, and the stone removed amounted to 21,528 cubic yards. The total length of galleries on June 30, 1881, was 13,523 lineal feet. The total number of cubic yards of stone in place removed was 39,608. The work of excavating now proceeds almost as rapidly as it is possible to push it with the due regard to economy; and it is probable that it will require nearly two years to complete the excavations preparatory to the final explosion. The area already covered by the excavations is 4 844-1,000 acres. As the galleries extended to greater distances from the shaft it became necessary to provide means for ventilation, for which purpose a ventilating fan twelve feet in diameter driven by a twelve by eighteen vertical engine was placed at the opening of the shaft.

It is estimated that nearly two and a quarter million dollars will be required to complete the work, including the removal of the debris at Hallett's Point to a depth of twenty-six feet at mean low water, removing Heel Tap and the reef at the North Brother, with some work on Frying Pan. Pot Rock, and in extending channels and excavations in the middle reef (Flood Rock.)

In Buttermilk Channel a considerable amount of dredging has been done, about 80 000 cubic yards of material in place having been removed, increasing the width and depth of the channel. Originally the channel, which lies between Governor's Island and the Brooklyn shore, was obstructed by a large shoal with a minimum depth of 9½ feet at mean low water. It lay in the direct track of navigation and too near the wharves of Brooklyn for the safe passage or maneuvering of large vessels.

No work was done upon the improvement of Gowanus Bay (Brooklyn), or upon the proposed ship canal at Harlem River, the right of way not having been secured by the commissioners appointed by the Supreme Court. A small amount of diking and dredging has been done at Flushing Bay, and also at Newtown Creek.

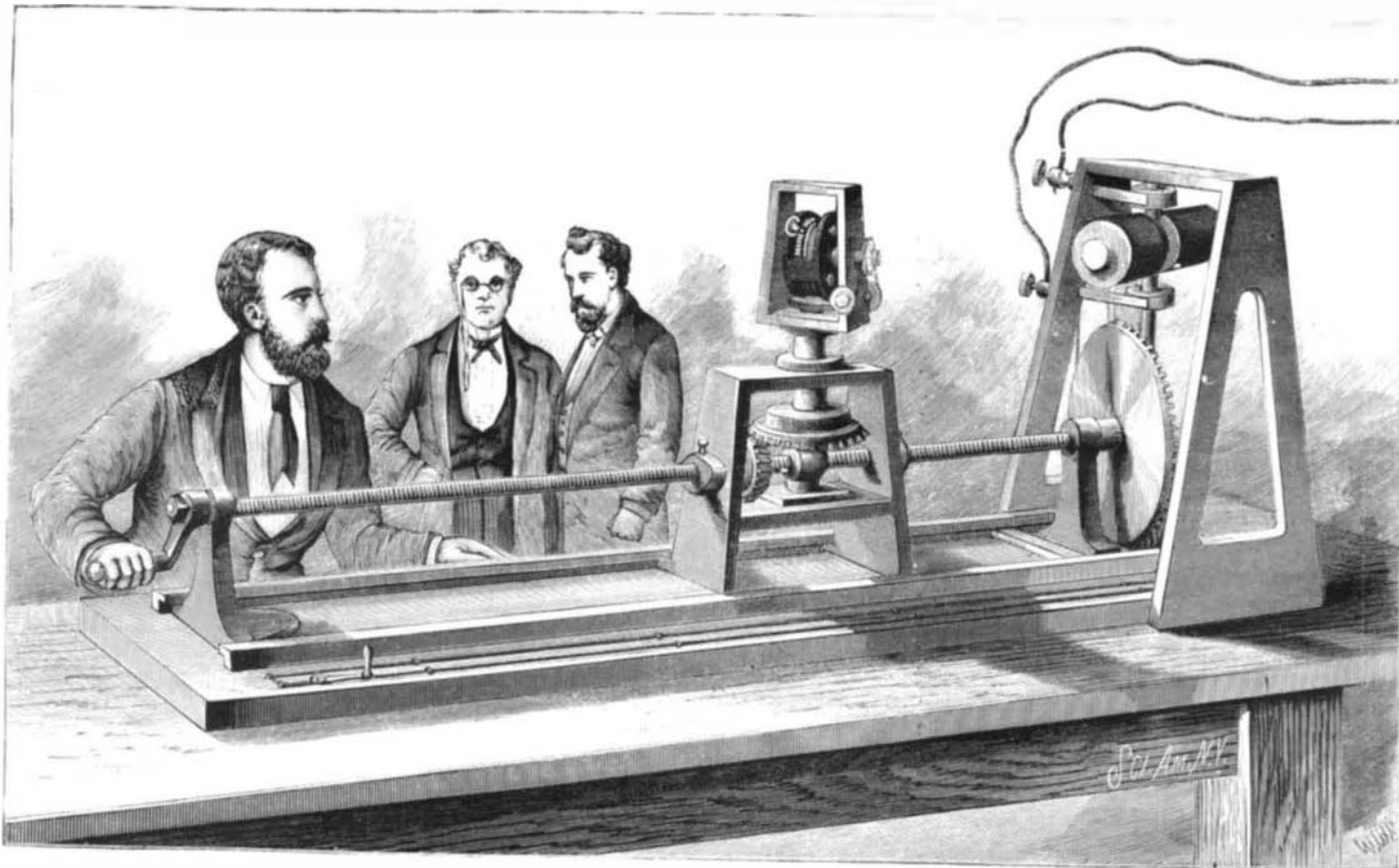
**Curious Experiment in Magnetism.**

The following experiment is described by M. Obalski, in a communication to the Academie des Sciences:

Two magnetic needles are hung vertically by fine thread, their unlike poles being opposite one another. Below them is a vessel containing water, its surface not quite touching the needles; they are hung so far apart as not to move toward one another. The level of the water is now quietly raised by letting a further quantity flow in from below. As soon as the water covers the lower ends of the needles they begin to approach one another, and when they are nearly immersed they rush together. The effect appears to be due to the fact that

when the gravitation force downward is partly counteracted by the upward hydrostatic force due to immersion, the magnetic force, being relatively greater, is able to assert itself.

**OLD MEN AS SCIENTISTS.**—Recently Prof. Huxley said that 99 men out of every 100 became simply obstructive after 60 years old, and were not flexible enough to yield to the advance of new ideas. The world, he thought, would be benefited by any man who had taken part in science being strangled after 60.



MAXIM'S MACHINE FOR DEMAGNETIZING WATCHES.

gradually weakened magnetic field until the final reversals were practically nil.

Mr. Maxim informs us that the machine illustrated is intended for the Paris Electrical Exhibition. That is certainly a good field for an exhaustive trial. Messrs. L. & A. Mathy, the well known importers of fine watches, No. 16 Maiden Lane, this city, have the exclusive agency for this ingenious instrument. It may be seen in operation at their establishment, where watches may also be sent for demagnetization.