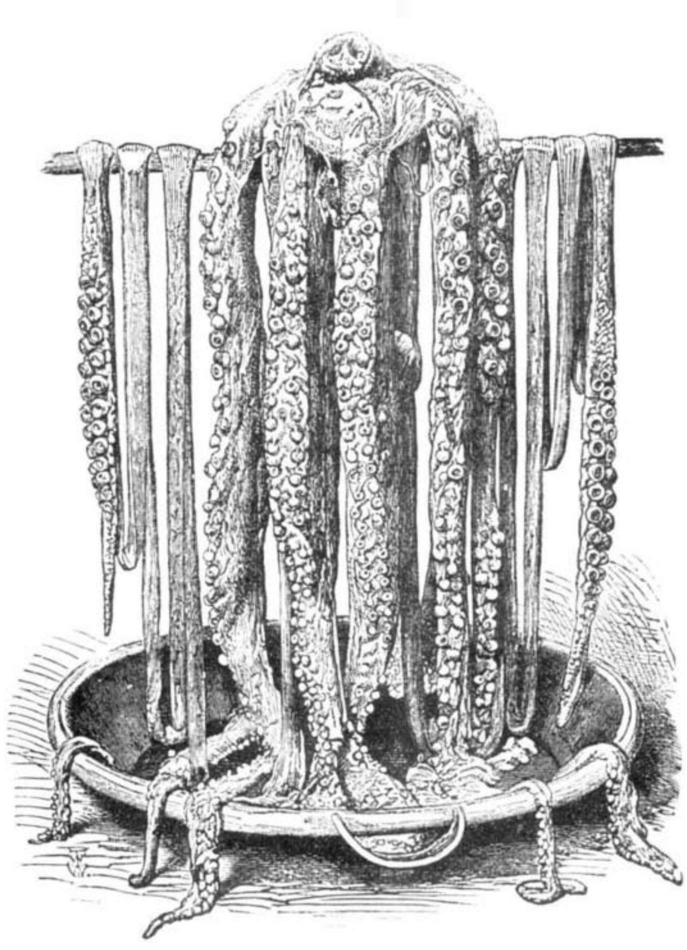
THE NEWFOUNDLAND DEVIL FISH.

Some weeks since we printed a letter from a correspondent in St. John's, Newfoundland, which was accompanied with a photograph, giving a description of a huge octopus or devil fish, found by some fishermen, entangled in their nets. We present herewith an engraving prepared from a photograph of this monster, which shows the head and arms with the beak in the center. The eyes are further back and do not appear. The nucleus is supported on a stand, and the eight short arms hang down with the suckers standing out prominently from the surface, the small ends resting in a round bath in which it had to be carried. A number of suckers are wanting in one arm, having been torn off in capturing the fish; the rest are perfect. At each side of the shorter arms the two long tentacles, 24 feet each, rest on a pole over which they have been doubled several times, their terminations, covered with large and small suckers, hanging down at the extreme right and left of the picture.

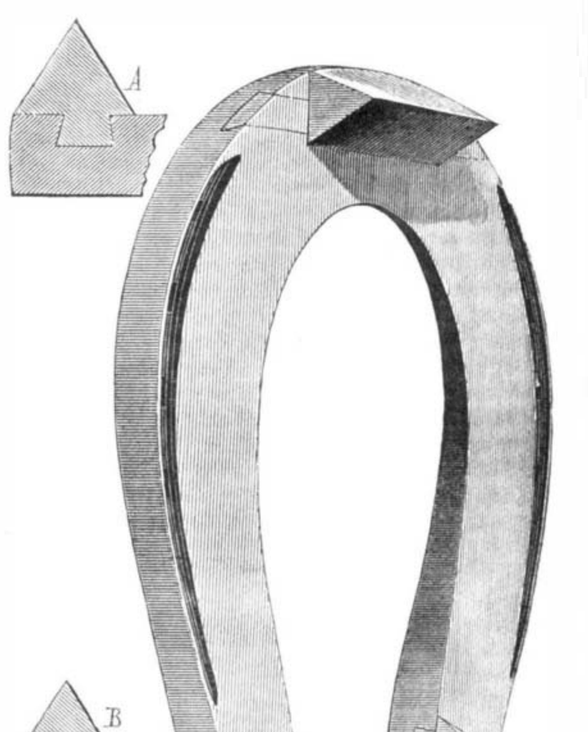
It is said that even this enormous creature is small beside some which infest the northern coasts of this continent, and of which trustworthy accounts are in existence. The terrible fate of any victim which may come within its clutches can well be imagined. Each of the short arms carries one hundred suckers; and the moment one of them touches the prey, the fish feels the contact and draws back a membranous piston. A vacuum is created and the edges of the disk are pressed against the surface of the victim with a force equal to the weight of the atmosphere added to that of the water above. The more the victim writhes, the more does it come in contact with other disks, each of which adheres; other arms soon encircle it, bringing it within reach of the powerful beak. "No fate could be more horrible," says a writer, in concluding a very graphic description of the monster, "than to be entwined in the embrace of those eight clammy, corpse-like arms, and to feel their folds creeping and gliding around you, and the eight hundred disks with their cold adhesive touch gluing themselves to you with a grasp which nothing could relax, and feeling like so many mouths devouring you at the same time. Slowly the horrible arms, supple as leather, strong as steel, cold as death, draw the prey under the fearful beak and press it against the glutinous mass which forms the body, and then, as the victim is paralyzed with terror, the powerful mandibles rend and devour." We doubt if the most depraved opium eater, in those terrible stages of delirium which succeed the delightful dreams induced by the drug, could imagine anything much more dreadful than such a death.



THE NEWFOUNDLAND DEVIL FISH.

BARNUM'S REMOVABLE HORSESHOE CALK.

Mr. John D. Barnum, of Amenia Union, Duchess county, N. Y., has invented a new removable calk for horseshoes, which, judging from the reports of its actual use, would seem to be a valuable and useful article. Its object is, while affording a sure footing to the animal on icy pavements, to economize in horseshoes and time; for instead of shifting shoes when the calks become worn out, it is only necessary to knock out the calks themselves, and very easily insert a new set. No especial shoe is needed, as all that is required to adapt the ordinary form to the device is the cutting of three grooves, one at either end and one near the toe, as shown in the annexed engraving. These grooves are made slightly tapering, and receive the dovetail tenon on the calks, as shown in the sections, A and B. The calk is attached by entering the small end of the tenon in the groove and then driving it tightly in. The projecting extremity of the tenon is then struck up or hammered smooth against the outer side of the shoe, forming a tight clinch.



When the calk has been worn and requires removal, it is only requisite to straighten out the clinched portion of the tenon and drive it out of the groove, when another calk may be inserted. Proposals regarding the investment of capital for manufacture, and inquiries for further information, should be addressed to the inventor as above.

Improvements in Concrete Construction.

A paper was recently read before the Institution of Civil Engineers, London, by Mr. Bindon Blood Stoney, C. E., "On the Construction of Harbor and Marine Works with Artificial Blocks of Large Size."

The author described a new method of submarine construction, with blocks of masonry or concrete far exceeding in bulk anything hitherto attempted. The blocks were built in the open air on a quay or wharf; and after from two to three months' consolidation, they were lifted by a powerful pair of shear legs, erected on an iron barge or pontoon. When afloat, the blocks were conveyed to their destination in the foundations of a quay wall, breakwater, or similar structure, where each block occupied several feet in length of the permanent work, and reached from the bottom to a little above low water level. The superstructure was afterwards built on the top of the blocks in the usual manner by tidal work. By this method the expenses of cofferdams, pumping, staging, and similar temporary works were avoided, and economy and rapidity of execution were gained, as well as massiveness of construction, so essential for works exposed to the violence of the sea. There was now being built in this manner an extension, nearly 43 feet in hight, of the North Wall Quay in the port of Dublin. Each of the blocks which composed the lower part of the wall was 27 feet high 21 feet 4 inches wide at the base, 12 feet long in the direction of the wall, and weighed 350 tuns. The foundation for the blocks was excavated and leveled by means of a diving bell, the chamber of which was 20 feet square and 6½ feet high. When the men were at work, the bell rested on the bottom. A tube or funnel of plate iron, 3 feet in diameter, rose from the center of the roof of the bell to several feet above high water level. An air lock in the top of this funnel afforded a passage up or down, without the bell having to be lifted out of the water. The material excavated was cast into two large trays, suspended by chains from the roof of the bell; when these were filled, the bell was lifted a few feet off the bottom, and the bell barge was drawn a short distance away from the line of the wall, where the stuff was discharged, by tilting the trays, and the bell returned to its work again. The hull of the floating shears was rectangular in cross section, 48 feet wide and 130 feet long. The aft end formed a tank, into which water was pumped to balance the weight of the block suspended from the shears at the bow of the vessel. The shear legs were rectangular tubular pillars of plate and angle iron, with a cross girder resting on the top; above this girder there were two sets of pulleys, through which were reeved the lifting (pitch) chains, formed of one and two flat links alternately. There were eight parts to each chain, or sixteen parts altogether, so that each part had to support, theoretically, one sixteenth of the suspended block. The inner ends of the chains passed down to the deck, where they were controlled by a pair of powerful crab winches driven by a 14 horse power steam engine, which also worked a centrifugal pump for filling or emptying the tank. The slack of the chains, after passing through the crab winches, was led under the deck, and was coiled up in the engine room over fixed pulleys by two donkey engines. When paying out chain, the donkey engines were thrown out of gear, and the crab winches on deck hauled up the slack according as it was wanted. Two cast iron girders were built into the bottom of each block, and at the end of each girder there was a rectangular hole. Four vertical tubes were built in the block over these holes in the girders, and the suspending bars were lowered from above and turned at right angles, so that their ends, which were T shaped, caught beneath the girders. The upper ends of the suspender bars were also T shaped, and were attached in a similar manner to the lower sets of pulleys, through which the lifting chains were reeved. When a block was set in place, the suspender bars were turned back 90°, and withdrawn for further use. Each block had vertical grooves left in the sides; and when two blocks were in place, these grooves formed a tube 3 feet square. A mass of concrete was subsequently thrown into the grooves, to act as a key or dowel between block and block; this completely plugged up the joints, which were only about ½ inch open on the face.

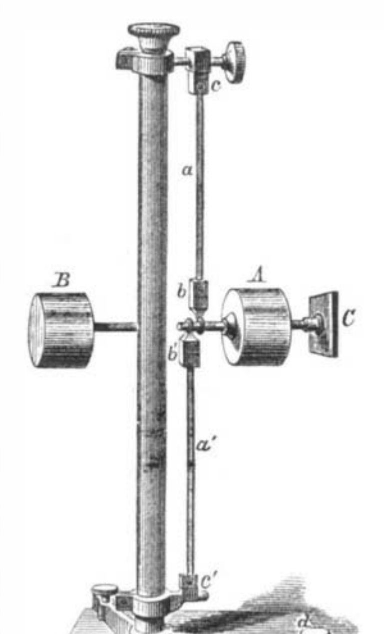
The paper also contained a description of an annular block of concrete 19 feet in diameter, weighing 80 tuns, which the author constructed for the base of a beacon tower, in the year 1863, and conveyed two miles down the Liffey, where it formed its own cofferdam, in water 5½ feet deep at low spring tides. The water was pumped out by hand pumps, and the ground inside excavated, concrete being placed on the top of the ring as it sank, like the brick wells in India or the shafts of the Thames Tunnel.

The method of making concrete and mortar, adopted by the author, differed in some respects from that in ordinary use. He preferred a rapid mixture of the ballast or sand with cement or lime to the slow triturating process of the mortar pan with edge runners. The concrete mixer, devised by him, driven by a 3 horse power engine, would turn out from 10 to 12 cubic yards per hour. The mixer was a fixed horizontal or inclined trough, open on the top, with a longitudinal axis, having stout iron blades at short intervals which, as they revolved simultaneously, pugged the materials and screwed them forward. The water was let on gradually through a rose, and the first few blades incorporated the materials in a dry state before they reached the water.

The author believed the application of the new system of gigantic blocks to the construction of breakwaters would, in many cases, be cheaper, more rapid, and more permanent than the ordinary methods of construction.

Zollner's Horizontal Pendulum.

M. F. Zöllner communicates to the English *Philosophical Magazine* a paper on the origin of the earth's magnetism and the magnetic relations of the heavenly bodies, in which he describes a method by which he considers we are enabled to measure even those small forces which are, for instance, produced by the difference in distance between any point on the earth's surface from sun or moon and the distance of the earth's center of gravity, or by difference in the centrifugal force of two points at different distances from the earth's surface.



The apparatus is represented in the accompanying engraving; *a a'* are thin watch springs held in continual tension by the weight, *A*, with the mirror, *C*, in front. The stand is made of iron, and the feet of the tripod are as long as possible, in order to effect very small changes in position of the points of suspension with regard to the direction of gravitations by the slow movement of the screws. By means of the screw *d*, situated in a vertical plane passing through the two points of suspension, *c* and *c'*, the sensitiveness of the instrument may be governed, as by the relative position of the points, *c* and *c'*, the time of vibration of the horizontal pendulum is determined. A time of vibration of 30 seconds (half a period) is easily accomplished. *B* is a counterpoise of *A*. Before the oscillating mass, *A*, and the parts belonging to it were placed in the rings, which fit into small incisions cut into the cylindrical axis, it was set in vibration by the direct action of gravity round a knife edge occupying provisionally the place of the turning point. The time of oscillation amounted to nearly 0·25 of a second. By means of a known relation, the the ratios of moments of direction are thus easily obtained, which are exerted by gravity on the vibratory mass in the