

NEW PROPELLING APPARATUS.

The two views given in the engraving represent an ingenious and convenient arrangement of machinery for driving a boat by foot power. The hull of the boat is of the usual construction, having a long and tapering propeller screw, whose shaft extends forward and receives its motion from a transverse shaft placed amidships and having foot cranks arranged diametrically opposite. In front of the shaft there is a frame which supports both the steering apparatus and the seat of the operator.

The propeller shaft is made in sections so that it may be lengthened or shortened; and the propelling and steering machinery is fixed to a single frame that may be moved backward or forward, as the loading of the boat may require.

The tiller ropes extend along the gunwale through suitable guides and are attached to the tiller. The rudder is partly supported by the screw shaft.

This invention was recently patented by Mr. A. E. Tangen, of Bismarck, Dakota Ter.

Alum not Allowed in English Bread.

George Allen, baker, of Walsall, was summoned at the instance of Mr. C. W. Stephens, sanitary inspector, for selling an article of food not compounded of the ingredients demanded, and also for selling bread containing alum, so as to be injurious to health. The inspector stated that he purchased a two-lb. loaf at the shop of defendant, and forwarded it to Mr. E. W. T. Jones, the borough analyst, whose certificate of analysis he produced. The certificate showed that the loaf was adulterated with alum in the proportion of 36 grains to the four-lb. loaf, and that such adulteration would tend to render the bread indigestible. Dr. J. Maclachlar, medical officer of health, gave it as his opinion that the quantity of alum stated would be likely to make bread injurious to health. Addressing the bench for the defense, Mr. Nanson said he did not dispute that there was alum in the loaf, but he urged that none was put in by the defendant or at his establishment, and that the flour was used just as it came from the miller. The bench, after hearing the defendant, considered the case proved, and imposed a fine of £5 and costs on the first summons, the other being withdrawn. The fine and costs amounted to £7 14s.

NEW MILLING ATTACHMENT FOR LATHES.

The invention illustrated herewith is intended to supply the wants of machinists who are unable or unwilling to purchase a milling machine and yet appreciate the great saving of labor, files, etc., effected even by the occasional use of such a machine.

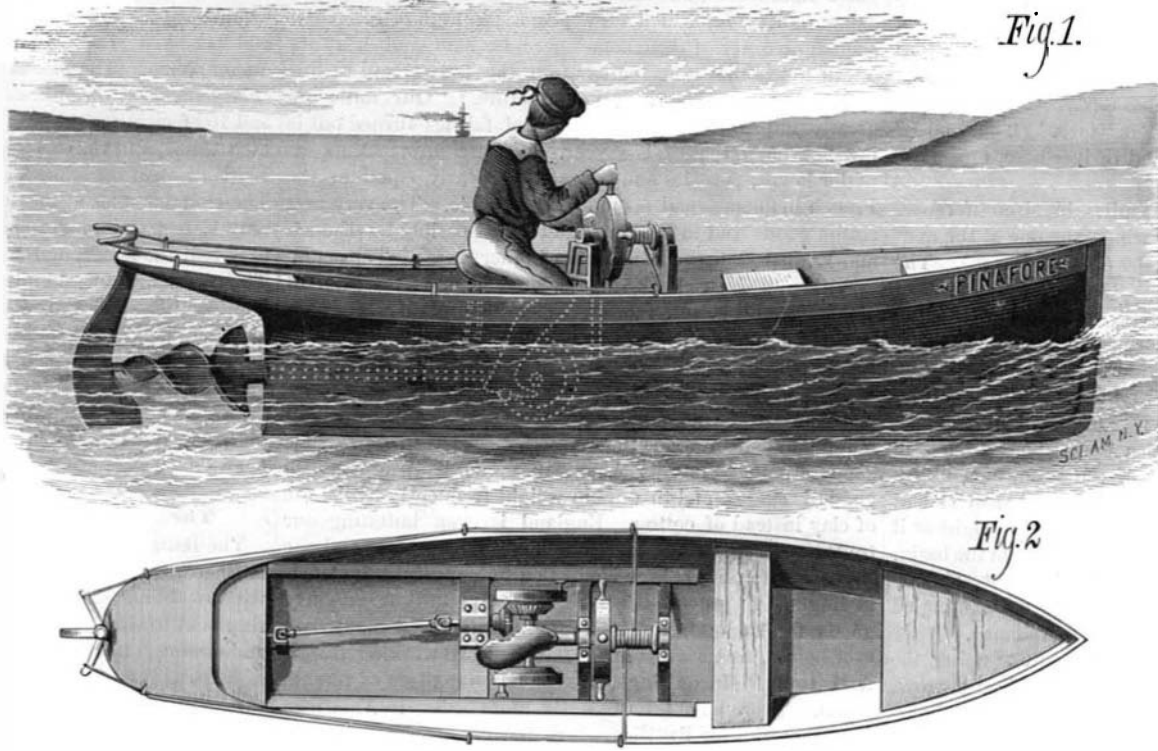
This device can be easily applied to any lathe, can be removed or put in position in a fraction of a minute, and will, it is claimed, work with the smoothness and solidity of the best milling machine. It consists, essentially, of a rectangular frame swinging between the lathe centers and carrying a cutter arbor. The position of this cutter frame is adjusted and its stability secured by means of the U shaped clamping plate, which carries a tangent screw, and is itself clamped to the lathe bed in front of the head stock.

The cutter arbor runs between steel center points, the right hand point being adjustable and secured by a jam nut. It is driven by a gear which is secured to a small face plate screwed upon the lathe mandrel. The front side of this gear carries the running center of the lathe, which bears against the projection of the cutter frame. The position of the cutter frame, and consequently the height of the cutter, is adjusted by the tangent screw engaging the edge of the annular worm wheel plate which forms a part of the cutter frame. This

plate, and with it the cutter frame, may be held in any position by the clamping nut which appears in front, and also by a similar nut on the opposite side, which does not show in the engraving. The cutter frame is therefore rigidly secured to the lathe bed at three points in a horizontal plane, and as the running center of the lathe occupies a central position there is no leverage or undue strain upon it.

The friction being upon hardened steel centers the machine runs easily at high speeds, and the solidity of the frame allows the taking of a heavy and smooth cut.

By relaxing a nut beneath the lathe bed and sliding back

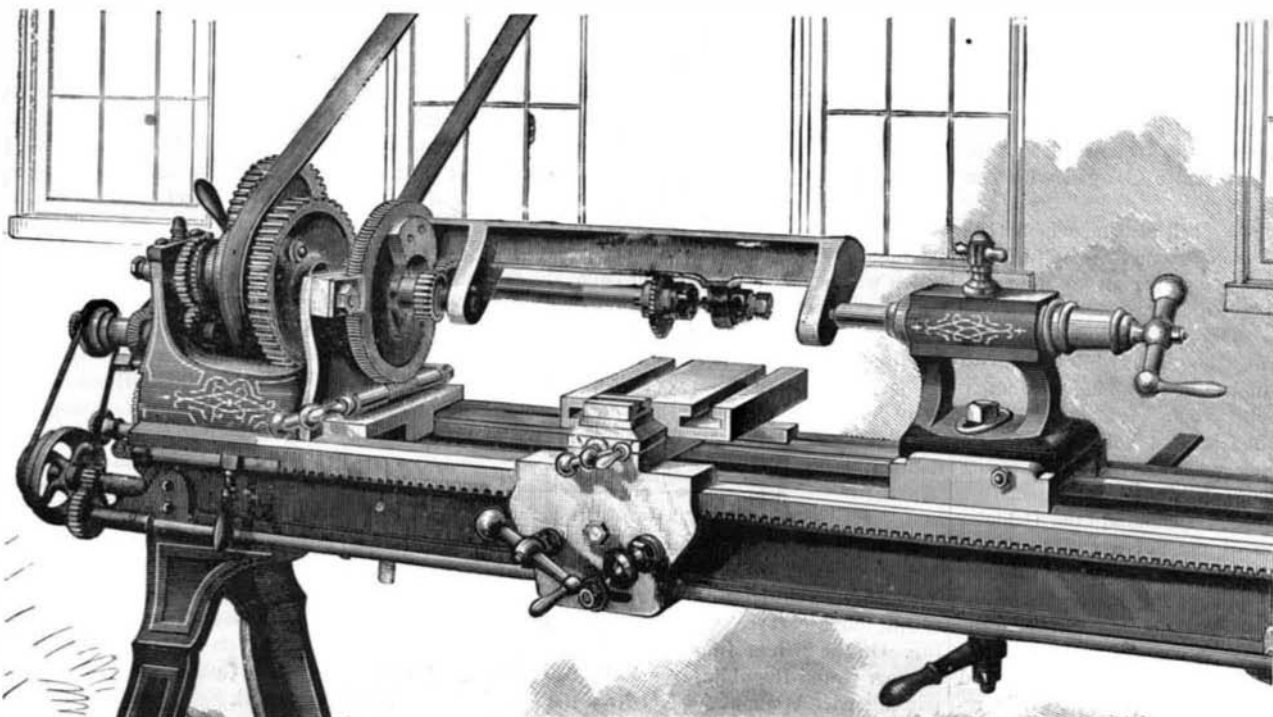
**TANGEN'S PROPELLING APPARATUS.**

the tail stock, both clamp plate and cutter frame are released and may be lifted off together.

The bedplate runs on the cross slide of the lathe carriage, and is linked to the tool head so as to traverse with it by means of the cross feed screw. Its longitudinal motion is of course that of the lathe carriage. This bedplate is made in sizes to suit different carriages, and is fitted with centers for fluting taps, facing nuts, etc., and is provided with a vise; it will carry any planer or milling machine vise or chuck of suitable size. It need not be removed when the lathe is performing its ordinary work as it is not in the way, serves to protect the slide from dirt and chips, and is often of use in boring cylinders and similar work. An ordinary parallel vise, mounted on a bar or shank fitting in the tool post, may be used to hold work, thus dispensing with the bedplate altogether. This arrangement, though less desirable, will do good service, and may in some cases be preferred.

Further information may be obtained from Mr. William Main, Piermont, Rockland county, N. Y.

Dr. Reimann advises those engaged in cotton dyeing to discontinue the use of tartar emetic. It does not fix the aniline colors themselves, but merely fastens the tannin, and as antimony can be dispensed with there is no reason why health should be endangered.

**MAIN'S MILLING ATTACHMENT FOR LATHES.****Antiquities from Chiriqui.**

At a meeting of the New York Academy of Sciences, June 2, representative specimens were exhibited of a large collection of flint implements, golden frogs, potteries, and the like, obtained by Mr. McNeill, from ancient graves in Central America. These objects are for the most part now in the possession of Mr. J. S. Lamson, of this city, who described, from Mr. McNeill's notes, the manner of their occurrence in the graves about the slopes of Chiriqui mountain.

The graves cover many acres (even many square miles) at the base of Chiriqui, near the coast, lying for the most part beneath many feet of alluvial deposit. No external sign

marks the place of one of these tombs, but the natives find them readily by sounding the soft earth with long iron rods, which vibrate when they come in contact with flat stones with which they are covered. Some of them are oblong in shape, like modern graves, but by far the greater part are nearly circular. The walls are all of sea-worn stones, of a kind not at present existing in the neighborhood, and the flat slabs that cover them have been brought obviously from a great distance, as no such material exists in the vicinity. It has not been discovered that these tombs are arranged with any regard to special order, but there is some sort of evidence that the larger ones have been reopened for the reception of bodies from time to time, down to a date of comparative recency.

The implements exhumed consist, in the first instance, of knives and rude weapons of stone, together with polishing stones, obviously used to smooth the surface of the

pottery. The latter shows a great many interesting forms, most common of which is the jar, very pointed at the bottom, with an extremely narrow neck, and not very inclining lips. They vary in proportions from jars having a capacity of less than a pint to those capable of holding two quarts. The ruder specimens rest upon tripods, while the more highly ornamented have no legs and must have been somewhat inconvenient vessels to handle. The coarser pottery is not decorated in colors. The top is bordered with an ornamented design cut in or incised so as to resemble the modern stamp, and there are some attempts at figure work, the principal animals being the frog, the owl's face, according to some, cougar's according to other critics, and the monkey; although Prof. Putnam, of the Peabody Museum, thinks that these so-called monkeys are rude representations of the human form.

The collection has also some very curious representations of birds, which are ornamented with red stripes upon a black ground. The latter are hollow within and perforated at the tail, at the bill, and beneath the wings, so as to be used as whistles to imitate the notes of birds, and to produce different musical notes by closing one or another of the apertures with the fingers. Their use, unless to attract birds by imitating their notes, is doubtful. The legs of the tripods are heavy, pod-shaped, and hollow, containing within several balls of pottery and furnished with a slit like old-fashioned sleigh bells. Their sound when shaken is similar to that of

a rattle-box; but it is scarcely credible that they were used for that purpose, although there are several pottery rattle-boxes in the collection. Professor Putnam, who had given the collection a careful examination, entered upon a very elaborate comparison of these remains with the Mexican, Peruvian, and those of the mound-builders, who, it appears, had a similar trick of hollowing out the legs of their tripods and furnishing them with movable balls. According to Professor Putnam, these remains are found as far south as Bogota, and while they have some affinity for the Mexican and Peruvian potteries, they are both less graceful in design and

less elaborate in decoration. He finds the frog a form common to them all, and so the cougar's or tiger's face. But the Mexicans usually sculptured a face or figure, head downward, upon the external aspect of each leg of the tripod, a feature seldom or never seen in this ruder work. They also ornamented their jars with hieroglyphic inscriptions (which have never been deciphered, by the way), and the latter have no place in the collection of Mr. Lamson, with a single doubtful exception. Professor Putnam did not attempt to assign any special age to these remains.

THE UNITED STATES DRILLING SCOW, EAST RIVER.

[Continued from first page.]

and steadying the drills while at work had proved inadequate. At this stage of the undertaking the management of the East River Improvement was intrusted to Major-General John Newton, U. S. Engineer, whose first work was to devise means for meeting the difficulties which had defeated his predecessors. The result was the drilling scow, the construction and working of which is illustrated by the accompanying engravings.

The scow is at once a boat, a machine shop, and a fortification. Its great size, massive structure, and overhanging guard, faced with iron, were necessary for the protection of its works against collision. At first such nominal accidents were of frequent occurrence. In a little while it was demonstrated that the colliding vessels were sure to get the worst of the encounter, and since then the pilots have given the scow as wide a berth as possible. Still strictly unavoidable collisions are of almost daily occurrence, owing to the necessary position of the scow while at work, the narrowness of the channel, and the severity of the tides.

In the center of the scow is a well hole 32 feet in diameter, in which is hung a hemispherical dome of boiler plate on an iron frame. This dome, or caisson, is 30 feet in diameter, open at top and bottom, and carries a number of strong iron tubes for the protection of the drill bars. It is also furnished with a dozen stout legs, so arranged that they can be let go all at once, when one edge of the dome touches the reef to be operated on. The legs are held by self-acting cams, so that, when extended to fit the uneven surface of the reef the dome is to stand on, they are securely locked, and thus support the dome in an upright position. The hemispherical shape was chosen for the dome on account of its superior stability under the action of the fierce currents. By converting the transverse pressure of the moving masses of water into a radial pressure downward, the dome is sure to stand firm.

The dome, as shown in the cross section, is attached to the scow by chains connecting with the hoisting engines, by which it is raised and lowered. The drill engines are carried by the stout framework inclosing the well, and are so mounted that they can be placed directly over such drill tubes as may offer the best positions for drilling. Within the dome is another ingenious device, by which a drill tube can be brought directly over any point on the bottom within the 15 foot circle of the upper opening of the dome. It is rarely possible and never necessary to drill as many holes as there are drill tubes provided; the larger number—20 are in the outer circle of the dome, and an unlimited number possible in the inner circle—being furnished to make it easy to locate the drill holes to the best advantage. The drills and drill rods are together about 10 feet long, and weigh between six and seven hundred pounds each. The cutting edges of the drills are in the form of a cross, and are 5½ inches in length. Originally the drill holes were 3½ inches in diameter, but the speed of cutting was found to increase with the enlargement of the bits, and now the larger size is used exclusively. The cutting is done by the impact of the falling drill bar, which drops from two to three feet. The drill rods are connected with the piston rods of the drilling engines by ropes, a flexible coupling being necessary on account of the liability of the scow to slight movements caused by shifting currents and frequent collisions, while the dome is fixed. The length of the rope is regulated by a feed gear, to suit the changing level of the scow due to the rise and fall of the tides. The operations of the scow are grandly simple. With the

dome swung by the chains the scow is anchored over the rock to be operated on, head to the tide, by stout chains fore and aft, and side anchors to insure steadiness. The anchor chains are strong enough to withstand not only the stress of the tides, but also the shock of colliding vessels. The site of the blast has already been fixed by the divers, and the scow, when in place, lies so that the dome is directly over the spot selected. Then the dome is lowered, and as soon as it touches bottom the legs are let go and the dome is unhooked from the scow. The diver next selects the most suitable points for drilling, and the drill tubes are brought into position, if within the upper circle of the dome; if not, the nearest available tubes are selected. The drilling engines are then placed, the drill rods are inserted, and the work is

the dome is raised clear of the bottom, and the scow is swung out of position or taken to some other reef.

The charges, inclosed in tin cases about 10 feet long and 5 inches, tapering to 4 inches, in diameter, are conveyed to the site of the blast on a small scow. Guided by the main line of the stoppers the diver, at slack water, descends to the first hole; the charge is passed down to him and inserted; then he proceeds to the next in order, and so on until all the drill holes are charged. In each cartridge is an exploding fuse, from which a fine wire leads to the exploding battery on the scow. When all the charges are down the diver returns to the scow, which is withdrawn to the proper distance and the blast is fired. The visible effect of the blast is the elevation of the water over the reef like a huge dome, which instantly bursts, sending up a huge tower of foam, water, and rock fragments from 50 to 200 feet in height. The appearance varies, of course, with the depth of water, the number of charges, and the amount of explosive used. The prevailing type under favorable conditions is that figured by our artist.

As many as twenty-one holes have been simultaneously fired on Diamond Reef, with a total charge of eleven hundred and forty pounds of nitro-glycerine. During recent operations the location of the dome has been determined by sextant observations, and its separate position and the position of each drill hole have been carefully laid out on a special plan of the reef. At first, the object being to remove with the greatest dispatch the more prominent points

of the reef, no attempt was made to secure a uniform removal of the rock. Latterly the work has been conducted by face blasting, with a view to the most complete and economical breaking up of the reef and to facilitate the removal of the rock, which is raised by grappling.

The scow has been used for the removal of the rocks and reefs known as Diamond Reef at the mouth of East River, between Governor's Island and the Battery; Coenties Reef, six hundred yards northeastward, in East River; Pot Rock and the Frying Pan, in Hell Gate; Way's Reef, Shell Drake, and a rock opposite 125th street, Harlem River.

During the past three years, though idle much of the time for lack of appropriations, a considerable portion of Diamond Reef has been reduced to the twenty-six foot level at low water; Way's Reef has been reduced from seventeen to twenty-six feet; Coenties Reef from fifteen to twenty-five feet; and the Harlem River Rock from nine to fourteen feet. Considerable work has also been done on Pot Rock and the Frying Pan.

MISCELLANEOUS INVENTIONS.

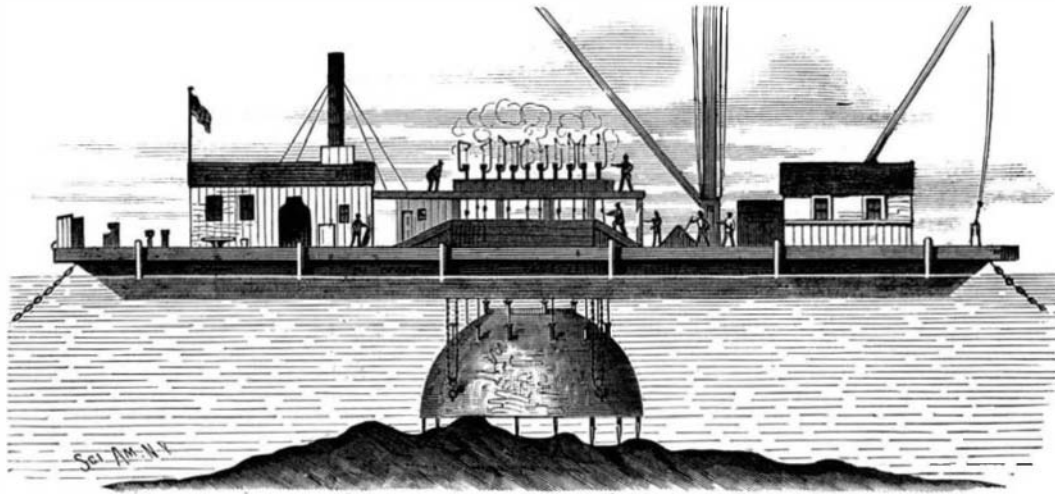
An improved window shade hanging, patented by Mr. Joseph Hemkeler, of Lowell, Mo., consists in combining with the curtain roller a second roll hung in loops of flat belts that are attached at one end to the window frame and connect the flanged spools on the ends of the rolls.

An insulator for telegraph wires, formed of a piece of glass perforated longitudinally, and a screw adapted to the perforation and having a round head provided with a square mortise for securing a key or screwdriver for driving the screw home, and having at each end a rubber ring, has been patented by Mr. J. H. Bloomfield, of Concordia, Entre Rios, Argentine Republic.

Mr. John Sherreff, of Dedham, Mass., has patented an improved mail box, provided with rawhide bunters or protectors. Its body is composed of stout paper board or vulcanized paper or fiber.

An improved article of hard rubber manufacture, formed of strips or sheets of metal foil and caoutchouc, has been patented by Messrs. Daniel F. Connell, of Brooklyn, and Edward Fagan, of New York, N. Y. The strips or shreds are distributed through the rubber to give it increased weight and density.

Mr. Prince H. Foster, of Babylon, N. Y., has patented an improved sanitary mask to be worn in sick rooms and in other places where persons may be exposed to infected or malarial air. It consists of a mask made of rubber or other suitable material, and secured air-tight to the head of the wearer by an elastic band. It is provided with valves and filters at the nose and mouth, and has transparent eye plates or windows.



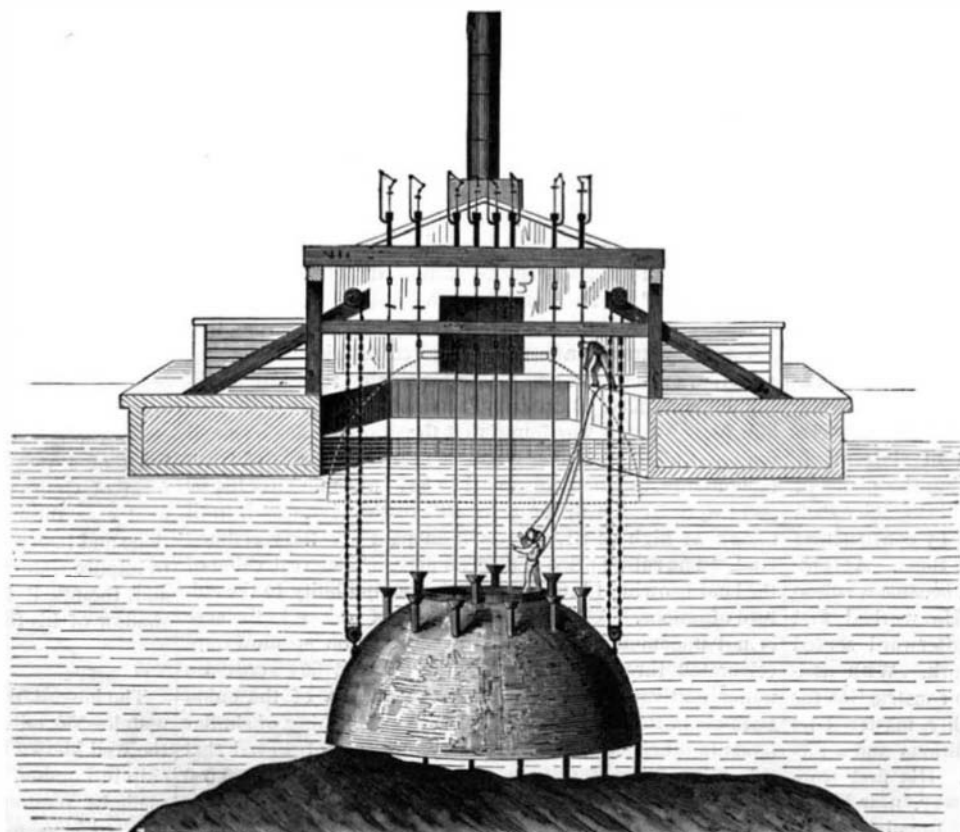
SCOW AND DOME IN POSITION.

set going. The average penetration of the drills during a shift of 8 hours is from 7 to 10 feet, according to the nature of the rock. The average penetration for each hole ranges from 8 to 12 feet. One sharpening of the drill bit usually suffices for a hole.



THE DOME.

The drilling completed, the diver descends and stops the holes with wooden plugs to keep them from filling with sand and mud, connects the plugs by cords, and the last one by a line to the surface. Then the chains are hooked to the dome,



CROSS SECTION OF SCOW, SHOWING WELL HOLE.