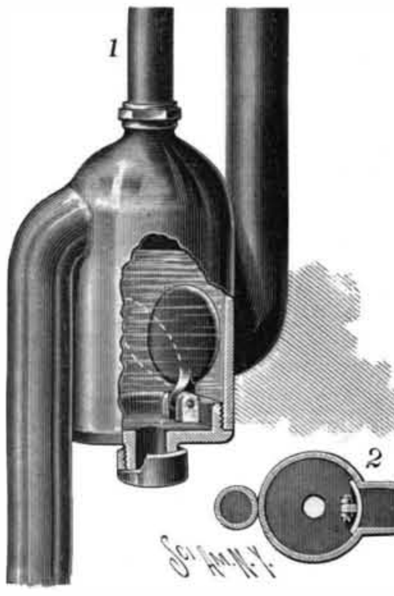
AN ACCESSIBLE SEWER GAS TRAP.

The improved trap shown in the illustration is designed to be perfectly proof against sewer gas and not liable to siphon, while being readily accessible for cleaning and other purposes. It has been patented by George J. Dehn, of Iron Mountain, Mich. Fig. 1 represents the trap in perspective, with a portion of its shell broken away to show the interior, and Fig. 2 is a sectional plan view where the inner valve is hinged. In the side of the trap body, below the inlet opening, a valve is pivoted on a clamping pivot held on a cap

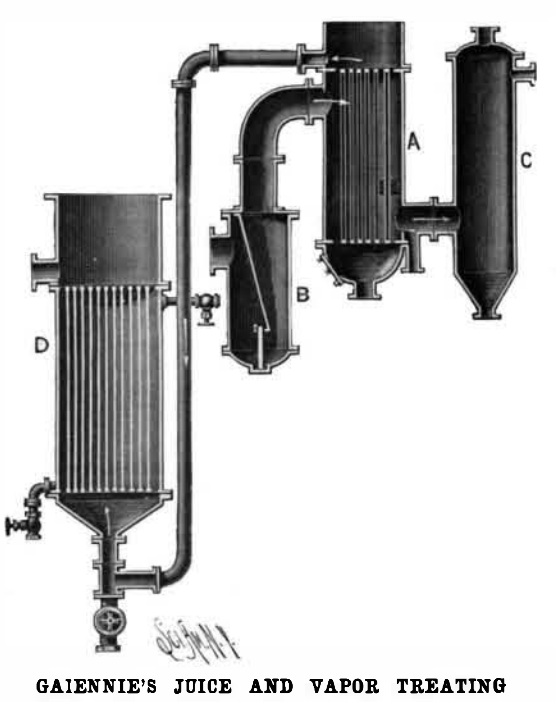


DEHN'S SEWER GAS TRAP.

screwing in the lower end of the body. The cap has an apertured and externally threaded lug, normally closed by a small cap, permitting the attachment to the bottom of the trap of a hose from a water main or force pump, to remove any stoppage in the outlet pipe. The upper end of the body of the trap is provided with a vent pipe, connected with the trap by a suitable coupling. By unscrewing the large cap any matter which may clog up the body of the trap is readily removed. When the small cap is removed, the valve is closed to prevent sewer gas from passing through the empty trap body and up the inlet pipe.

APPARATUS FOR TREATING JUICE AND VAPOR.

For condensing the vapors produced by evaporation in the vacuum pans of sugar processes, and economically heating and clarifying the juice, the apparatus shown in the accompanying illustration has been patented by Alphonse F. Gaiennie, of Lafourche (Thibodaux P. O.), La. The condenser, A, has a shell with upper and lower heads carrying pipes opening at their lower ends into a chamber connected with an inlet pipe bringing cane juice from the mill, the upper ends of the pipes discharging into a tank at the top. Near its upper end the condenser, A, is connected with a vapor pipe provided with a catch-all, B, the vapors thus pass-



GAIENNIE'S JUICE AND VAPOR TREATING APPARATUS.

ing from the vacuum process of evaporation, and surrounding the pipes, giving off the heat of the vapors to the juice flowing upward through the pipes. The vapors flow downward around the pipes and in a nearly condensed state pass through a pipe to a water condenser, C, to be finally condensed, their being in the pipe an outlet to carry off any condensed liquid. The juice passing upward through the pipes in the condenser, A, and accumulating in the tank at its top, passes from the latter into a chamber forming the lower end of a superheater, D, through which pass pipes whose upper ends open into a tank with an outlet pipe connected with settling tanks. The central shell of the superheater is connected with a suitable source of steam supply, whereby the juice passing upward through the pipes is heated. It is designed that the juice flowing upward through the condenser, A, will be heated up to about 130° to 140° Fah., to be in proper condition for additional heating in the superheater, D, while the vapors flowing downward around the pipes will have their temperature so lowered that they will readily condense in the water condenser, C, the whole process of condensing the vapors and heating and clarifying the juice being thus carried on in a very economical manner.

Surface Colors.

The object of the little book on this subject * by Dr. Walter, of Hamburg, is apparently to furnish zoologists, mineralogists, and chemists with an accurate explanation of certain color phenomena which are not as yet universally understood, and which are incompletely treated even in the best text books on physics. The keynote of the whole book is given in a single sentence of the introductory chapter: "The intensity of the light reflected from any body may be calculated by Fresnel's ordinary formulæ for colorless substances, in the case of those rays which are slightly or not at all absorbed by the body in question; but for wave lengths which are strongly absorbed by the given substance, Cauchy's formuæ for the intensity of metallic reflection should be used." It appears from these formulæ that the intensity of the reflected light depends on the index of refraction and on the coefficient of absorption of the substance presenting the reflecting surface. Since both these factors are different for light of different colors, it is shown that white light must be reflected with some of its "components" relatively weaker than others, i. e., no longer in the proper proportion to give the sensation of white light. The application to the colors seen in the mineral kingdom is illustrated by the example of magnesium cyanplatinite, $MgPt\ (CN)_4$, where—as is true of most crystals—the index of refraction and the coefficient of absorption vary with the direction in which the light vibrates, as well as with the wave length of the light. The extent to which true surface color is observable on minerals is not indicated, though the possibility of a very wide application is clearly shown. In the appendices, certain mathematical aspects of the subject are treated in a manner suited to the requirements of physicists.—The American Naturalist.

ACCIDENT TO DRY DOCK NO. 2—NEW YORK NAVY YARD.

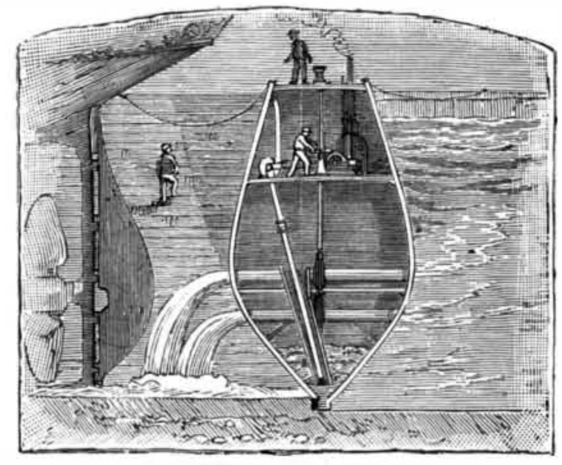
An accident to the great Simpson dry dock at the New York Navy Yard, Brooklyn, N. Y., occurred on the evening of August 8. The dry dock was pumped out and by some means the caisson, closing its mouth, was lifted from its seat so as to permit the entrance of water. As the water increased in depth, the caisson was lifted from its seat. The water madly rushed into the dock, carrying with it the caisson, which capsized and sank, and the torpedo boat Ericsson, which was badly injured, having its bows stove in. The commandant's launch was wrecked. Other vessels were nearly torn from their moorings and some minor damage was done. The accident, which was an unprecedented one, is attributed to the fact that the caisson was too light. It seems that a number of tons of ballast had been removed from it in order to permit the cleaning of its bottom, and this ballast it was proposed to replace by concrete ballast. It was supposed naturally that the caisson would stay in its place as the water pressed it against the gasket, but on account of an unusually high tide or other cause, the accident occurred.

We thought it of interest to our readers to give the annexed cuts to show what sort of structure the caisson is. It is to all intents and purposes a very deep narrow vessel, somewhat like a cutter. It is of such size as to fill the opening of the dry dock. It is prevented from entering it by its keel stem and stern post, which form a uniform flange around its bottom and sides, and which bear against a projecting piece at the mouth of the dock. A rubber gasket is attached to the face of the projection, so as to make a water-tight joint as the caisson is pressed against it.

One illustration gives the cross section of the caisson and shows the method adopted to admit water when the dock is to be filled by means of pipes extending through the hull. This feature is also brought out in the illustration of the caisson in place at the opening of the dock where water is seen streaming through it. It is manipulated by flotation. When the dock is full of water, the caisson is lightened by pumping out water ballast. If in place closing the dock, it will rise from its seat, and can be pulled to one side. For replacing it is floated into position, ballasted down to its seat, and the water in the dock is pumped out.

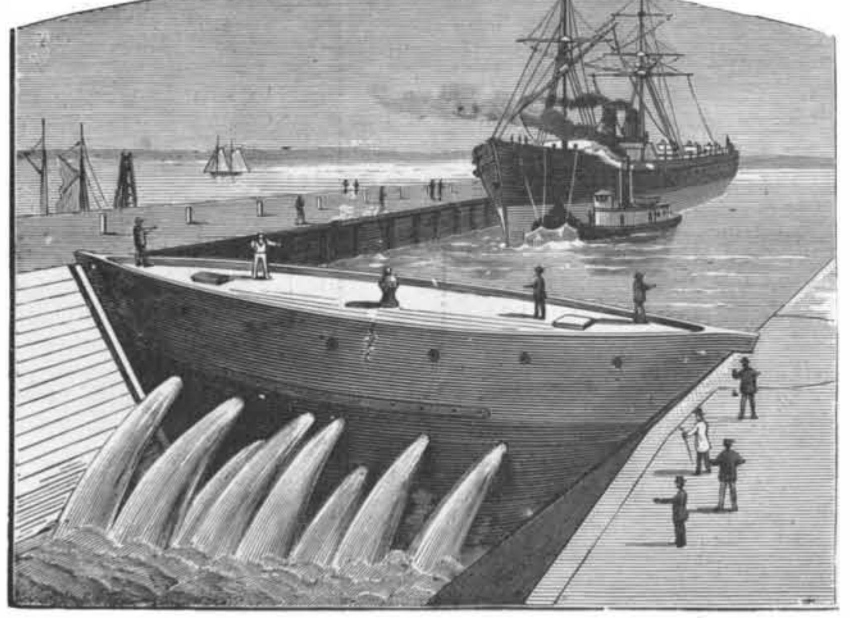
The dock in which the accident happened is known as Dry Dock No. 2 and is 500 feet long, with a top width of 130 feet and 4 inches.

In our issue of November 30, 1889, a somewhat extensive account is given of this dry dock, now thrown into uselessness at a period when much required. The accident necessitates sending large ships to the South for



SECTION OF THE CAISSON.

docking, because the stone dock of the Navy Yard is too short for large modern ships. The dock which is thrown out of use by the displacement of the caisson is built of timber, and a third dock, which we have also described in our columns, is now in course of construction on substantially the same plan.



CAISSON IN POSITION.

An Electric Scorer for Fencing.

Mr. Muirhead Little, F.R.C.S., a pupil of the veteran maitre d'armes M. Bertrand, has invented a very ingenious means of judging hits in fencing bouts. The machine was tested with great success at a competition between M. Bertrand's pupils at his spacious fencing room in Warwick Street. The end in view has been achieved by covering the front of each jacket with fine copper or brass wire gauze and connecting this with the adversary's foil and an electric bell (of the burglar alarm pattern) and battery in the same circuit. It follows that when a hit is made the circuit is closed and the bell rings and continues to ring until stopped by the person in charge. A special arrangement in each foil handle provides that only a direct point produces a ring. Two entirely electrically distinct circuits are used, each including a bell, foil, and jacket; flicks, or blows, or grazes produce no result. The bells being of different tones, and, moreover, placed on opposite sides of the room, there is no difficulty in deciding who has scored a hit, or in cases of almost simultaneous hits, who delivered the point first. By a very simple arrangement the wires passing from the batteries to the combatants' collars are kept well out the way, however sudden may be their movements of advance or retreat. The wires did not interfere in the least with the foil play of the competitors, who were scarcely conscious of the connection. Captain Hutton and other distinguished amateurs who were present expressed themselves as much pleased with the "electric umpire," an opinion which M. Bertrand, who has done so much for the encouragement of fencing, shares.

* Die Oberflachen oder Schillerfarben, von Dr. B. Walter, pp. viii + 122, Braunschweig, F. Vieweg und Sohn, 1895.