Philadelphia International Electrical Exhibition.

An international exhibition of electrical appliances will be opened in Philadelphia on September 2, 1884, under the auspices of the Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanic Arts. The project has been recognized by Congress, which passed an act, approved by the President, providing for the admission, duty free, into the United States of all articles for exhibition only. Judging from the success that has attended similar exhibitions in Europe, the fact that it is the first of the kind held in America, the high position occupied by American electricians, and the eminent reputation of the institution having the matter in charge, the project will have a prosperous issue. Any information concerning it can be obtained by addressing the Secretary, Franklin Institute, Philadelphia, U. S. A.

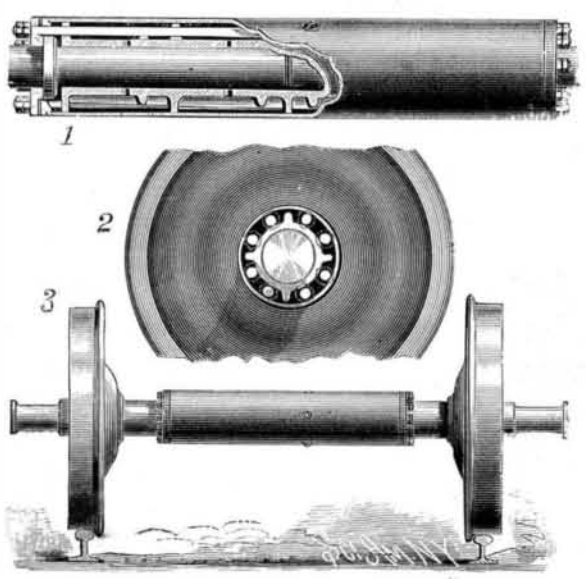
How Cholera is Bred and Spread.

In a communication to the London *Daily News* Dr. William B. Carpenter suggests that Professor Tyndall's doctrine that cholera germs are bred in the human intestines, and from them by means of excrement are diffused, does not go far enough in assuming by implication that the human intestines are the only breeding place of cholera germs. Dr. Carpenter gives three remarkable instances as evidence that cholera, or at least the almost equally fatal choleraic diarrhœa, was caused by offensive piggeries, by a retarded drain in marshy ground, and by a compost heap of unnamable filth in an unused yard. The outbreak of fatal disease in each of these cases was directly traced to these sources, the effluvium being borne on the wind. In each the disease was successfully combated and finally conquered by a removal of the filthy cause.

CAR AXLE.

By this invention the sliding of the wheels upon the rails of steam and horse railroads, and the consequent strain, wear, and loss of power are prevented. The axle is of either steel or iron, and is made in two parts, the wheels being attached in the ordinary way. The two parts of the axle are placed in line with and abut against each other, and have collars formed upon them near the wheels, as shown at the left in Fig. 1. Upon the adjacent parts of the axle and between the collars is fitted a cast steel or iron sleeve, formed with flanges around its ends, intermediate points, and center, and with four ribs upon its outer surface, extending from the center flange to the end flanges. Upon the flanges is shrunk a wrought iron sleeve, the ends of which project a little beyond the ends of the inner sleeve, so as to overlap the collars. Steel rings, rabbeted to receive the ends of the wrought iron sleeve, and of a diameter sufficient to allow the collar to pass, are placed at each end. Upon the axle at the outer sides of the collars are steel rings, made in two parts, and between these rings and the rings on the wrought iron sleeve are inserted a number of thin sheet metal washers, by the removal of one or more of which the end wear of the parts can be taken up.

The parts are held together by long bolts which pass through holes in the outer steel rings and through recesses in the flanges of the inner sleeve. In the outer sleeve are a number of openings, closed by screw plugs, some one of which will always be upward when the axle is at rest, to allow oil to be readily poured into the space between the



MEEHAN'S CAR AXLE.

sleeves. As the axle revolves, the ribs on the inner sleeve, and the long bolts, raise the oil which passes through the bolt recesses in the flanges to the space at the ends of the inner sleeve, where it comes in contact with the axle and collars. The oil also passes through openings in the inner sleeve and along longitudinal grooves in the inner surface of the sleeve, so that the entire frictional surface of the axle is kept lubricated. From the above description and the engravings it will be seen that either wheel with its connected part of the axle can move independently of the other, and by reason of the long bearing surface thus secured, no appreciable wear of the parts is possible.

This invention has been patented by Mr. Thomas Meehan, of 27 Park Row, New York.

SAFETY STOP FOR ELEVATORS.

Considerable ingenuity has been displayed in devising means of arresting elevator cars in case of accident to the hoisting rope or machinery, but in spite of that many accidents have occurred for want of a really efficient stop.

We give an engraving of an improved safety stop for elevators recently patented by Mr. William Whitely, of Housatonic, Mass., which is very simple and at the same time seems to embody the elements of success.

The elevator car is guided by tongues on the vertical beams in the elevator well in the usual way, and is supported by a wire rope secured in its sleeve, A, projecting

WHITELY'S SAFETY STOP FOR ELEVATORS.

through the top of the car and fastened by two nuts, one above and the other below the top of the car. This arrangement of the sleeve and nuts admits of regulating the tension of the rope, by adjusting the nuts surrounding the car; there is a frame consisting of a crossbar, B, side pieces, C, and a crossbar, D, connecting the side pieces under the car. This frame is connected by a rope with the weight, E, which nearly counterbalances the frame and supports it partly above the elevator car. In grooves in the side pieces, C, are pivoted cams, F, connected by links with bolts extending downward through the car top, and fitted with rubber springs to relieve the shock of stopping the car. So long as the hoisting rope and machinery act normally, the frame and its cams will move with the car; but should the hoisting apparatus give way, the car falling faster than the frame brings the cams, F, to bear against the timbers at the sides of the well with sufficient pressure to arrest the car and prevent further accident.

A Remarkable Ice Well.

BY H. C. HOVEY.

A remarkable well exists on the premises of Mr. Levi Allen, at Horse Plains, Missoula County, Montana. This well was dug to supply a steam saw mill, situated on low grounds, distance three-quarters of a mile from the Pond Orelle River, in what seems to have formerly been the bed of the stream, although the ground is now solid and firm. At the depth of 35 feet a strong current of air was encountered, sufficiently strong to extinguish a common lamp or candle. The digging was continued to the depth of 45 feet, and then a steam pump was fixed reaching to within 15 feet of the bottom of the well.

Last September the well began to freeze up, and as it was important to keep it from doing so, Mr. Allen had it thoroughly banked with saw dust. The process, however, went on until by the last of November it was frozen solid. The mill has now been idle for several months. About the 1st of July the proprietor went down to see the condition of things, and found "two feet of solid ice in four feet of pump!" He would like an explanation of this surprising state of things, and to know what can be done to make his well serviceable.

The latter inquiry cannot be properly answered without a more exact knowledge of the locality. Quite possibly a new well sunk a few feet from the first one might be free from ice. Plainly the strong current of air comes from some bidden cavity of large size. In exploring caverns it is invariably found that when a strong draught is observable through a narrow aperture, it indicates the proximity of some large chamber. A new well, by escaping the aperture, would be exempt from the cause producing the ice.

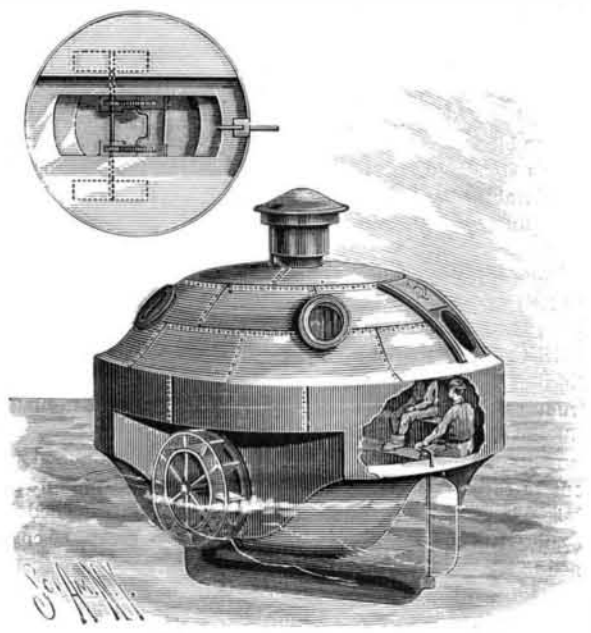
The phenomenon is not unprecedented by any means, although not very frequently observed in this country. Ice wells have been found in Vermont and New York, and their peculiarities described by Silliman and Hitchcock. An ice cave may be seen at Decorah, in Iowa, which is fully described in White's Geological Report (vol. i, p. 80). The ice caves of France and Switzerland are numerous, and an account of them has been published by Rev. G. F. Browne From an ice cave on the Peak of Teneriffe a great ice supply is annually obtained for ships; which, being columnar in structure, melts less readily than the ordinary sort, and is therefore especially suitable for transportation. One of the largest of these natural ice houses is in the Carpathian Mountains, near the village of Stelitze, and is resorted to in midsummer to supply the wants of the villagers. At that season the roof is covered with icicles, and the drops falling to the sandy floor are instantly congealed. On the approach of winter the icy mass is said to begin to dissolve; and by Christmas it is gone, leaving the cavern warm and dry till spring returns, when the ice forms anew! Ice has also been known to form in very deep mines, for instance in the Imperial salt mines at Iletski, in the Ural Mountains. Here there is a series of natural hollows in the gypsum, where, when the weather is hottest, the ice hangs in solid masses, that melt away again amid the rigors of a Russian winter.

Several different theories have been brought to explain this class of phenomena. It has been suggested as a cause that nitrous earth dissolved by flowing water makes a freezing mixture; that waves of cold set in motion in winter fail to penetrate the crust of the earth till the next summer, and that warm waves are likwise retarded until the following winter; that the heavy cold air sinks into subterranean recesses, whence the light and warm air fails to dislodge it; and that currents of air, blowing through caverns, produce intense cold by the simple process of evaporation. This latter theory looks the most plausible, and would readily account for the frozen well of Montana.

Still another theory, however, may be mentioned—that suggested by Prof. Lowe, in a paper read before the Boston Scientific Society, in 1879. His theory, suggested by the action of what is known as the Frizzel air compressor, is, in brief, that bubbles of air drawn into water flowing down through fissures in the rock are liable to a continually increasing pressure, compelling it to part with latent caloric, which it immediately absorbs from the water on being liberated in any cave or well or mine. This process may sometimes be sufficiently active to reduce the water to a frozen condition, from which it would be relieved whenever the flow was arrested by surface freezing, drought, or any other cause. Possibly there may be two or more of these conditions in combination in Mr. Allen's well, making the water in it remain unaffected by common climatic changes. It is to be hoped that he may continue his interesting observations, and report them from time through these columns.

LIFE BOAT.

The hull of the boat herewith illustrated is preferably made of sheet iron, and in its characteristics differs much from the common boat. The horizontal sections are circular, with the exception of a segment, which is cut away from each of the two sides to admit the paddle wheels. The sides of the boat next to the wheels are vertical, and the floor of the boat over each wheel serves as a seat or storage room inside. A cut water, a keel, a stern post, and a rudder are formed outside of the circular contour. The hull of the boat is provided with sides forming a vertical cylinder, and with a nearly spherical roof joining the upper edge of the cylinder. Around the roof are sealed lights, and in the center is a cupola perforated for ventilating the interior. At one side of the roof is a sliding door, for entrance and exit, which is made water tight by packing. The interior is



HAMILTON'S LIFE BOAT.

provided with seats, and straps and buckles are secured to the wall to draw over the bodies of occupants to sustain them in very rough weather, and loops are placed below the seats for the passengers to thrust their feet into. The paddle wheels are attached to short shafts provided with pinions into which engage spur gears mounted on a crank shaft revolving in bearings secured to the boat, the crank extending across the hull in a location to be conveniently worked by the occupants. This boat may be carried by ships and used to escape from them in case of accident. A large number of persons with the necessary provisions may be carried in the roughest water without danger.

This invention has been patented by Mr. Tobias Hamilton, of Centrefield, Ohio.

Intestinal Parasites in Domestic Fowls.

During the past year Dr. Thomas Taylor, microscopist of the Agricultural Department, has examined several sick domestic fowls to ascertain the cause of their ailment. The first examined was in a moribund condition when received, and died within an hour after it was brought to his division. Its comb was of a deep red color, abnormally so, the tips being somewhat black. On dissection, its general viscera presented nothing peculiar; but on removing those of the thorax and abdomen, the lungs excepted, he observed on the intercostal muscles, bordering on the ribs, what resembled a superficial reddish pigment in streaks, while small specks of various forms covered the lining of the abdominal cavity. These varied in size from the point of a pin to that of a small pin bead. On removing a small portion of this colored matter, and viewing it under a suitable power of the microscope, he found it to consist of living mites (*acari*) in various stages of growth. He next removed a small portion of the lung tissue, and placing it under the microscope, here again discovered several living mites. Another portion was removed from the lungs, not exceeding half a grain in weight, when three more mites were discovered. These last were so lively that it was difficult to keep them long in view without changing the stage.

This mite closely resembles Cytoleichus sarcoptoides (Megnin). Athough this species has not hitherto been found in America, it is known in Europe and has been found in such habitats as above described, and Megnin states that it causes the death of wild and domestic fowls. He says that they are found in the air passages of the lungs, in the bronchial tubes and their divisions, in the bones with which the air sacs communicate, and in other cavities. They are also found in the bronchi of birds, and when they are extremely numerous, cause titillations of the bronchial mucous membrane, indicated by a slight cough, in some cases causing symptoms of asphyxia, and of congestion, to which the birds may succumb. He instances an example in the case of a pheasant which died of an unknown disease, and in which, when dissected, this obstruction of the bronchi was well manifested.

Dr. Taylor thinks it probable that these mites, after they have effected a lodgment in the lungs, bore through the pleura and invade the thoracic and abdominal cavities, where they breed in large numbers, producing great irritation and ultimately the death of the fowl.

About two months after the dissection of the first fowl in which he found the mites above described, a second fowl in a moribund condition was brought to him for examination by the same gentleman who brought the first. The comb of this fowl was also highly engorged with blood and the tips black. Its crop was greatly distended. It was unable to stand up, breathed with difficulty, yet exhibited considerable strength when about to be killed. It had been sickly during the previous four weeks. He took the precaution in this case first to remove the skin, so that he could examine the cellular tissue, when he observed great numbers of small white opaque specks of various dimensions, varying in size from the one-hundredth of an inch to the one-twelfth of an inch in diameter. When viewed under the microscope, the tissue showed within its folds and cell structure numerous mites, which proved on examination to be Laminosioptes gallinorum (Megnin). Further investigation showed that the opaque markings above alluded to contained, in many instances, the remains of one or more of these mites. The substance of the opaque specks seemed to be calcareous. The habitat of these mites seemed to be confined to the cellular tissue wholly. He examined the viscera and cavities of this fowl, but found neither living mites nor their remains or calcareous specks.

Megnin states that in Europe this acarus has been found in all turkey hens, and especially in foreign turkeys of the family Phasania.

He says that these acari gather in millions in the cellular tissue and destroy the fibers, but without causing any other change than the production of the calcareous concretions spoken of. He further says "They have been noticed in such numbers in old birds as to leave no doubt as to their being the cause of death." The existence of either of the mites above described in American fowls has not hitherto been known.

In this same fowl he found thousands of encysted nematoids, resembling, when viewed under a low power of the microscope, Trichina spiralis; but when removed from their watery cysts and viewed under a power of about 500 diameters, they seemed to be of an undescribed species. The male worm has on its posterior terminal point a bulbous body furnished with spines which distinguishes it from any other nematoid with which Dr. Taylor is acquainted. These encysted worms are wholly confined to the muscular coating of the stomach and intestines.

On examining a third fowl, which was dead when brought to him, he found in its cellular tissue numerous mites of the species gallinorum above described.

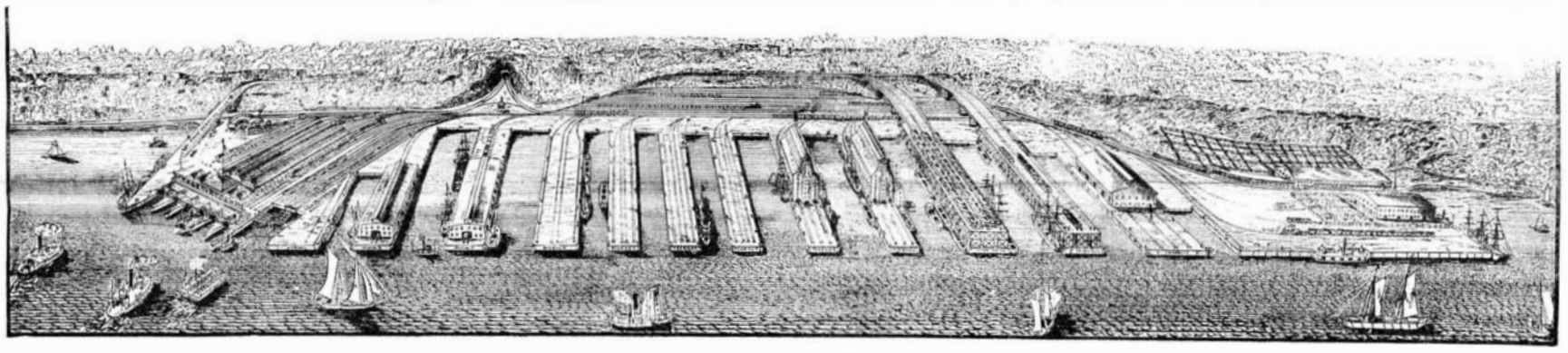
Dr. Taylor says from these examinations it seems probable that a considerable amount of disease prevailing among American fowls, and not referable to any known type, may be due to the presence of such parasites as he found in the cases above mentioned. Investigations in this direction, may, therefore, have an important bearing on the healthful raising of domestic fowls.

He suggests that carbolic acid, or other disinfectants, sprinkled in and about nests and on the floors of henneries, might prove useful as an antidote to parasites of the classes described, as well as to those which infest the exterior of the bodies of fowls.

NEW YORK TERMINUS OF THE N. Y., W. S. & B. R.

When planning the terminus at this end of the New York, West Shore, and Buffalo Railway, the officers anticipated an immense traffic in the future, and provided means for its rapid and easy handling. The location of the terminus being on the west shore of the Hudson River, just below the beginning of the high bluffs, and at a point not yet encroached upon by Jersey City and Hoboken, gave them access to an almost unlimited water front and permitted the erection of dock facilities which are unrivaled in this harbor, and are free from street and other obstructions. The road passes from the plains back of the river through a tunnel 3,985 ft. long, cut through solid trap rock, and sufficiently wide to admit of two tracks. The cuts forming the approaches to the tunnel have a combined length of 3,300 feet. As the road leaves this end of the tunnel, it divides into branches leading to the several docks.

To the extreme left of the drawing, or south, is the round house. Next to this are the ferry slips and railway passenger stations. Lines of boats will run from here to Forty-second Street, New York city, and also to a down-town point. Adjoining the ferries are the freight transfer slips, where loaded cars are run upon scows and towed across the river to their destination. Steamship docks and warehouses for the loading and unloading of the largest ocean vessels come next. Docks devoted to the local river and coast trade, and to lumber form the next division. On piers 8 and 9 will be built two grain elevators of great capacity, one of which is now being erected. Two coal transfer piers come next. The loaded cars will be run upon a trestle high enough to enable them to discharge their loads directly into vessels lying alongside. The tracks leading to these piers, after passing from the mouth of the tunnel, make a sharp turn and skirt along the base of the hill, gradually rising and finally turning again toward the river, going over the lower tracks on bridges to the piers. To the extreme right of the drawing are shown the completed stock yards and abattoir.



There are 275 acres devoted to the terminal, and 165 acres of upland suitable for building lots. An idea of the extent of the work may be formed from the fact that the water front measures 6,790 feet, and the front and sides of the docks measure 30,290 feet, or $5\frac{74}{100}$ miles. The terminal property is owned by the West Shore & Ontario Terminal Company, of which Mr. Walter Katté is chief engineer. The accompanying drawing is reproduced from a pen sketch by F. S. Cook, engineer in chief of the topographical department of the N. Y., W. S. & B. R. All the capital stock of the Terminal Company is owned and held in equal amounts by the West Shore and Ontario Railway Companies.

Soaps as a Vehicle for Medicine.

Pure soap alone is a valuable and convenient remedy for many affections of the skin, causing a softening and soothing influence pleasant to the feelings and the sight, besides exerting a healing effect in most cutaneous diseases; and from this softening property it causes any medicinal substance it properly contains to act more certainly, and with greater promptness, than perhaps any other vehicle that is at present known.

In adding a medicinal substance to soaps, some intelligence should be had to properly understand the character and compatibility of the several constituents of each, for there are many drugs that are not suited to mix with soap, that will not combine or are decomposed and changed by the alkali present in all soaps, and which is always present in slight excess, else it would not do proper duty as a soap; for though soaps are not truly soluble in water, yet their action in use causes an emulsion that has this softening action and pleasant effect, though it be washed away with more water, leaving scarce a trace of soap behind.

In making a medicated soap the first care should be to have the purest and cleanest fats or oils that can be obtained and also the best and purest alkali known, while great skill must be exercised in the making to insure a perfect combination, in fact, a thorough soap; and there are few ready made that can be recommended, as sophistication is now a common practice in the making of most all the soaps of commerce. Having such a soap, the best means of combining the remedy is by means of the mill, for it can be added without heat, while the perfume if used can be combined at the same time. All colors as a rule should be avoided, unless the drug will give an unpleasant one; then to please the eye a color can be used, but care must be taken to have an inert or harmless color, compatible with the medicine.

The best and more suitable soaps for medicinal purposes are undoubtedly those made from vegetable oils, such as olive, palm, and almond oils, though mutton tallow would make a very suitable soap combined with any of the oils named; and if cheapness is desired, a little resin will not injure its healing qualities, but in some cases might prove beneficial, as it enters into many healing salves in the pharmacopœia. In using palm oil it should be previously bleached as the natural color it contains is an objection; this oil is particularly applicable for medicated soaps, but as by itself it becomes too hard it is well to add a nut oil or cotton oil to give it plasticity.

It is impossible here to give all the formulas for the different medicated soaps, in fact, even give a list of the many substances that could be combined with soap to make such; yet I shall try and mention a few that I think are the most worthy. Thus for cosmetic purposes the juice of the lettuce and cucumber have a blanching effect on the skin, benzoin, tar, petrolatum, and carbolic acid give their healing properties to all soaps, and borax has a very softening influence. For disinfection, soap is a good vehicle for menthol and thymol, and other well known drugs, in fact, with suitable intelligence the manufacturer could make an endless variety of medicinal soaps, using the drugs in the proper proportion and making them all carefully. A mucilage of gum tragacanth added to all soaps for medicinal purposes causes much emollience, and exerts a great softness to the skin. In my technology of soaps details are given for most all the medicated soaps now known, and the proper proportions for manipulation.—*R. S. Cristiani, in Oil, Paint, and Drug Reporter.*

Pouchkoff's Modification of the Holtz Machine.

As well known, the fixed plate of the Holtz machine, as at present constructed, carries *externally* two paper armatures that are charged in order to prime the apparatus. Each of these armatures is fixed at the edge of an aperture through which one or several paper points act upon the movable disk.

In order to simplify the construction of the machine, and avoid the always delicate operation of making apertures in the plate, Mr. Pouchkoff, after gluing the armatures on the exterior of the latter, glues the points on the interior and connects the two by a horseshoe-shaped band of paper on the edge of the disk.

The machine thus constructed works, according to Mr. Pouchkoff, just as well as one of the ordinary kind.—*La Lumiere Electrique.*

Micro-organisms in Water.

Osmic acid possesses the property of hardening protoplasm, hence microscopists make use of it for detecting animalcula in water. According to L. Maggi, the chloride of palladium may be substituted for the more poisonous osmic acid, an acid more dangerous than prussic acid. By adding to the water a solution of palladium chloride (one in eight hundred) he obtained a precipitate in which the bacterial forms could be recognized under the microscope just as distinctly as in those obtained with osmic acid.—*Gazz. Chim.*