

hot water are added, the mixture stirred, and the suspended matter allowed to settle.

The liquid is next filtered through a small piece of good filter paper adjusted in a glass funnel, the filtrate being collected in a small clean vessel of porcelain or glass. The residues are shaken up repeatedly with small quantities of clean water, the washings being thrown on the filter, and the filtered liquid allowed to mix with the clear acid copper filtrate. The dish containing the residues, as well as the filter, must also be rinsed with a little water, so that none of the copper liquid may be lost by adhering to them. If these operations have been properly conducted all the copper will be contained in the filtered liquid. The decomposing cell into which this liquid is next placed is shown in the illustration.

The cell is an ordinary flat-bottomed drinking glass. The strips, A, B, and C, are of thin platinum foil, three inches in length and two in width. Over the upper end of each piece a strip of lead foil is doubled, with the battery wires inserted and pinched between the lead and platinum.

The lead-bound edges are forced into slits in the strip of wood, B, which suffice to hold them firmly enough in position. The outer strips, B and C, are joined by wires and connected with the positive pole of the battery, the middle plate, A, being connected with the zinc pole. Two cells of any of the common gravity form of battery used on telegraph lines may be used, but a single element of the bichromate (carbon) type is preferable and more convenient.

In using the decomposing cell the plate, A (minus the lead binding), is first heated to redness for a few moments to cleanse it, then weighed and slipped into position, with as little handling as possible. The battery being set up and connected properly, the acid solution of copper is poured into the glass, the plates immersed in it, and the decomposition allowed to proceed undisturbed until the liquid has lost its color, and a drop of it, when brought into contact with a drop of strong ammonia water on a white porcelain surface, no longer develops a perceptible blue color. The plates are then lifted out, with care if the deposited copper does not adhere firmly, and the liquid in the glass is decanted and replaced by boiling water. This cleanses the plates, and the heat imparted by it causes them, when taken out, to dry quickly. The plate, A, is at once detached, with any filaments of copper which may have separated in the cell, and weighed. This weight, minus weight of platinum, corresponds to the weight of metallic copper in the sample of ore taken. If the sample weighed one-third of an ounce avoirdupois, multiply the weight in grains of copper found by 13.714, to convert it into terms of pounds per ton.

Iron, zinc, nickel, cadmium, and other minor impurities, may be present in the copper solution, but so long as there is any copper present no considerable quantity of any of these is likely to be thrown down with the copper from the acid solution with one cell of battery.

#### Large Schools of Sperm Whales.

Several incoming shipmasters have reported seeing schools of sperm whales working southward along the New Jersey coast, of late. Captain Sawyer, of the bark Ibis, just arrived from Pensacola, reports "two miles of black-backs and water spouts" off the Carolina coast, July 16. He said to a *Sun* reporter: "It was on Saturday and Sunday when we encountered these sperm whales going south or southwest, as if to round Hatteras. They were going very slowly, backs above the water, and were spouting all of the time. They were strolling along in groups, sunning themselves half an hour at a time, and then taking a header, and coming up to spout.

"First we met two schools of about 100 each, I should say. Occasionally they frolicked and flopped about heavily in a sort of dignified and elephantine sport. More followed, and the next morning, Sunday, we saw more. Altogether there were over 700 on the picnic. We passed within 500 feet of two big fellows, but they seemed preoccupied and didn't notice the ship. I don't think they knew we were there."

"Had you any means of capturing them?"

"No; and it did seem a pity to have so much valuable sperm oil indolently swimming away from us. There were some big whales there too. I said to Limerick, one of my men here, 'Now, there's a fellow that's worth \$2,000,' and he must have been, and there were bigger ones in the school. It would have been a harvest for a whaling ship. A million dollars in sperm whales is too good a haul to let go by, but we couldn't do anything. Occasionally I've seen a sperm whale cruising along as far south as Savannah, and once in a while I've heard of whale ships off about there. But I never saw so many whales at one time before anywhere."

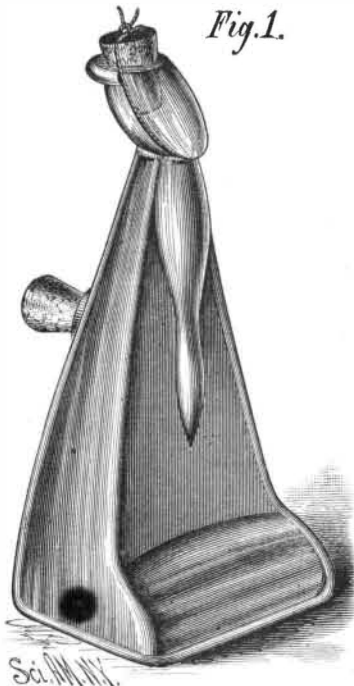
It will be remembered that the Bermudas used to be the center of the sperm whale fisheries of the North Atlantic. Of late years the pursuit of whales has been almost abandoned, and they seem to have multiplied rapidly.

#### Birch Bark Rubber.

It is said that a dense black gum may be obtained from the outer layers of the birch tree bark by distillation, which possesses all the ordinary properties of gutta percha, and has the additional merit of resisting the deteriorating influence of air and the corrosive action of acids. This advantage makes it useful as an ingredient of India-rubber and gutta percha, which it renders far more durable. Whether these statements are true remains to be proved.

#### A NOVEL BOTTLE.

Dr. J. B. Moore, of Philadelphia, in *Druggists Circular*, has said that "it often happens, in dropping a medicine from a bottle a little too full or with a badly formed lip, the most steady and practiced hand can with difficulty drop a dose even with a near approach to accuracy." . . . "To the nervous and careworn attendants who are so frequently found in the sick chamber the task of dropping medicines becomes doubly irksome and annoying, and especially when it has to be done, as in cases of lingering illnesses, day and night, sometimes for weeks at a time. Besides, it is sometimes impossible, no matter with how much care and judgment the dropping is performed, to prevent the number of the prescription and the directions on the label from being defaced, if not entirely obliterated, as is often the case, and the outside of the bottle becoming stained and bedaubed with liquid, and especially if it be any of the stronger acids or iron preparation; and the trouble does not stop here, for the hands are liable to be stained, and the clothing, the furniture, or any damageable article that the medicine may come in contact with may be ruined or soiled."

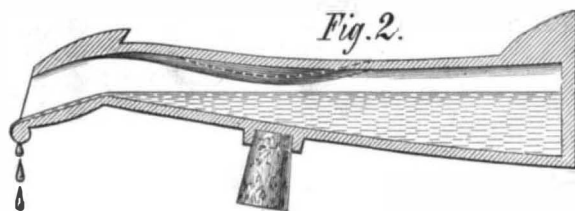


GOLDSMITH'S IMPROVED BOTTLE.

In the ordinary prescription bottle, during the act of dropping or pouring, the liquid is often two-thirds above the lower lip, and hence the air cannot find ready entrance, and either dropping or pouring becomes difficult and vexatious. In the improved bottle the liquid level (even when full) is always on a level with the lower part of the neck. Its inclined side and crooked neck form double inclined planes, which, with its shape and the airway, make it a complete dropper, obviating all the objections to the ordinary bottle. The liquid will not, during the act of pouring, "run back" outside to deface the label, the hands, or furniture. The shape secures steadiness; but should the bottle topple over a cork inserted in the recess on the inclined side will prevent breaking or spilling of the liquid, and the cork thus used will afford support and aid as a rest on dispensing medicines.

This bottle may also be used for table sauces, for perfumery, for patent medicines—for any purpose for which the ordinary bottle is employed.

It does away with the necessity of purchasing a dropper, which takes time and trouble to adjust in the ordinary bottle, and which, besides the expense of first cost, is liable to be out of place or lost. In the new bottle the dropping feature is a part of the bottle and goes with each one, while the bottle can be made at a cost (not above that) of those imperfect and annoying ones, now in daily use by millions of people. It will become a necessity in every household.



The bottle has a conical or pyramidal shape, so that the greater part of the weight of the liquid in the vial will be concentrated at the base of the same, thus giving the bottle or vial a much better bearing and protecting it from being thrown over as easily as the bottles in use at present. This bottle has an inclined neck, with a lip or a bead at the lowest point of the edge to facilitate pouring the liquid from the vial in single drops. If the neck of the vial is inclined the flow of the liquid can be controlled much better than if the neck is straight. As is shown in Fig. 2, the liquid rests mainly on this inclined side of the bottle, and as it cannot flow up this inclined surface very small quantities of the liquid can be drawn by slightly lowering the neck of the vial. The vial is provided with an air channel for conveying air into the interior of the vial to prevent bubbling of the liquid. The air can pass through this channel from the neck to the extreme rear end of the vial. The cork is secured in the

neck of the vial by means of a cord or wire, catching on a projection of the neck of the vial. For further information address the inventor, Mr. W. T. Goldsmith, 64 Corn street, Atlanta, Ga.

#### Correspondence.

##### A Remedy for Sea Sickness.

To the Editor of the *Scientific American*:

Having noticed from time to time the different remedies suggested for sea sickness, I concluded to give you my experience through two voyages of several days' duration, one during particularly rough weather. My first sensation on reaching the ocean was that of being in a very high swing. The same sensation of nausea immediately exhibited itself. It struck me at once that probably the same means adopted to overcome the sickness in the swing would prove effective on the sea, that was, to force the swinging. I therefore watched the motion of the steamer, and as she was about to descend I made an effort as though to force her down. Continuing this for a short time the feeling of nausea disappeared, and I had no recurrence of it during either voyage, separated by several months' duration. I have no idea that every one could be so successful, but I fully believe that nearly any one with a little determination and strength of stomach can easily overcome sea sickness by this means.

W. E. F.

Helena, Montana, August, 1881.

##### How to Prevent Car-Safe Robberies.

To the Editor of the *Scientific American*:

The late robbery of the safe of the express company on the Rock Island road leads me to offer the following plan to prevent such cases: The safe to be provided with combination locks; the safe to be locked by the express company's agent at New York city on leaving that place; the numbers of the combination to be telegraphed to agents of the express company at Chicago, San Francisco, and any intermediate places; the safe to be opened by them on its reaching their places. The messenger in charge of the car, not knowing the combination, could not, even by compulsion, open the safe, nor could it be opened by any practicable means except at the proper places.

WALTER L. SMITH.

Weston, Mass.

##### MISCELLANEOUS INVENTIONS.

An improved device for thawing out sink spouts has been patented by Mr. Amos Stevens, of Fairfield, Me. A pipe of considerable less diameter than the sink spout is passed through this spout and is as nearly in the middle of the spout as possible. The upper end of the inner pipe is slightly tapered outward, and passes through and is fastened to a slotted plate forming a strainer. This plate supports a cup fitting into the upper beveled end of the inner tube. If the water in the sink spout freezes, hot water is poured into the cup, from where it flows through the inner pipe and thaws out the sink spout in a short time.

Mr. George O. Denison, of Waterloo, Ind., has patented an improved bag holder made low in front and high in rear to expedite the filling of the sack and prevent the grain from running out at the rear of the bag holder. It is provided with suitable hooks adapted to be inserted into the upper end of the sack to secure it to the bag holder. The holder is partly supported by a coil spring.

An improvement in horseshoes, patented by Mr. Sebastian K. Minton, of Des Moines, Iowa, consists in the combination with halves hinged together at the toe and having their upper faces beveled inward of the toe calk, having a hole and slot, and heel calks having right and left screw threaded holes, by which the heel of the shoe may be expanded.

Mr. William T. McLean, of Sidney, Ohio, has patented an improvement in that class of earth scrapers the body of which is made of thin sheet steel with wooden backboard, the lower edge of which has always heretofore been secured to the scraper by means of rivets passing through the bottom of the scraper in such a manner that the rivet heads soon wear off by abrasion and let the backboard loose, which wholly disables the scraper for further use until repaired. The improvement consists in the construction and arrangement of the devices for more perfectly securing the wooden back to the steel body without the use of rivets.

An improved drag saw has been patented by Mr. Samuel Clemens, of Rockport, Ill. The invention consists in having the saw blade pivoted at one end of a lazy-tongs connected with the framework of the apparatus, and in having a hand lever pivoted to the said framework and connected with the lazy-tongs by means of a pitman to operate the lazy-tongs.

An improved sand guard for car axle boxes has been patented by Mr. Henry Roth, of New York city. The object of this invention is to improve the construction of the sand guards for which Letters Patent No. 235,293 were issued December 7, 1880, to the same inventor, in such a manner as to make them more effective.

An improved wagon step, patented by Mr. Henry F. W. Koehler, of St. Joseph, Mo., consists in a novel arrangement of a cam lever, a slotted crossbar, two connecting bars, and a step or steps, all arranged in a frame attached to the wagon body. By this means provision is made for lowering the steps for use or turning it up out of the way by moving the lever in one direction or the other.