PRIME'S WASH BOILER.

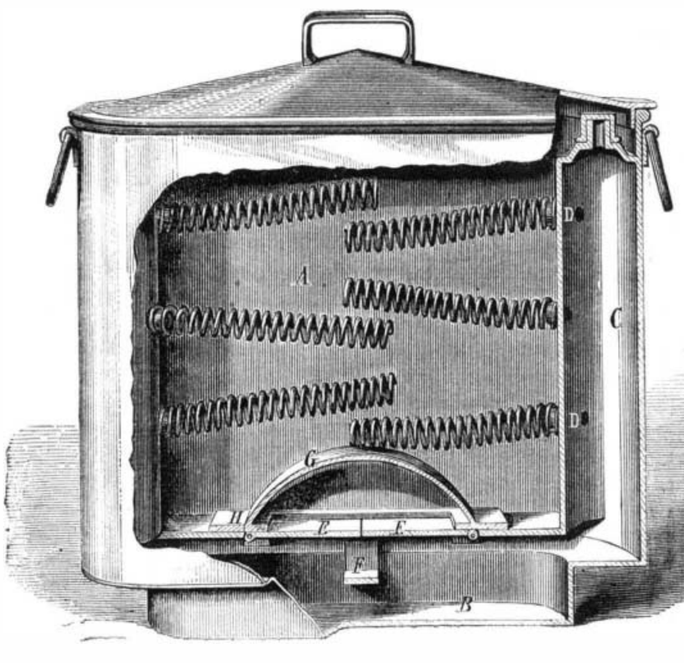
The inventor of this device proposes to furnish an improved and more effective circulation of the steam and water among the clothes by means of appliances which prevent the contents of the boiler from packing around, and so closing the orifices in its sides. The illustration shows parts of the apparatus broken away, with sectional views of other portions, and affords a clear idea of the interior arrangements.

A is the wash boiler, which may be of any suitable design. B is the receptacle beneath for the soap and water. C C are chambers or channels closed at the top and connecting with the interior of the apparatus by means of the orifices, D. The spiral springs shown are so arranged as to fit over the ends of short tubes around the perforations, within the boiler, and to extend through and among the clothes. E E are wing valves opening downwards as far as the guard, F, and protected from being choked, by the clothes above, by the guard, G. These valves are hinged to a plate, H, which may be readily removed for cleaning the heating chamber.

By means of the spiral springs, channels are afforded which admit of a free escape and circulation of the steam and water passing from the heating chamber, B, through the conductors, C. The springs may be either used separately, being placed in and removed from the boiler with the garments or they may be attached to nozzles, as shown, or directly to the walls.

The various portions of this device are easily accessible for cleansing or repairs, and the apparatus is claimed by its inventor to thoroughly meet all practical requirements.

Patented through the Scientific American Patent Agency, Nov. 12, 1872. For further information regarding agencies, sale of machines and territory, address Geo. M. Prime, Eldorado, Ark.



PRIME'S WASH BOILER.

Litmus Paper.

When the physician and pharmacist buy litmus paper, says Dr. Squibb, they generally make the same mistake that the photographer does, and demand that it shall be deep in color, that the blue shall be very blue, and the red very red. This is wrong in principle and in practice, particularly for physicians' uses, where slight traces of alkalinity or acidity are often important, and the palest instead of the deepest paper should always be selected. To prepare good litmus paper, the following formula may be useful: Take of good litmus, in fine powder, 1 part; water, 4 parts; alcohol, 1 part, all by weight.

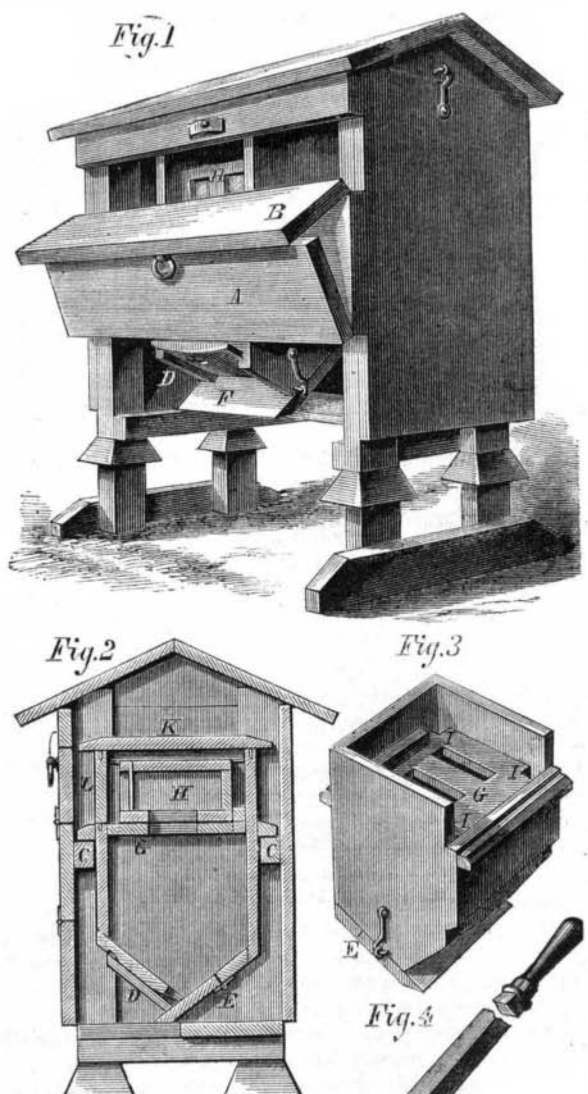
Put these ingredients into a bottle, and shake the mixture occasionally during 24 hours; allow the sediment to settle out completely, and decant as much as possible of the clear liquid into another vessel; then put the same quantity of water and alcohol upon the sediment, shake again and, when again well settled, pour off the clear liquid for use in diluting the first portion of liquid, or for dissolving a fresh portion of litmus. Separate about one fourth part of the first clear liquid, and add to the remainder dilute sulphuric acid until it becomes of a purple tint, or gives a purplish blue color to a slip of white paper; then add about one half of the separated fourth part of the solution, and if this should entirely restore the original pure blue color, again add diluted acid until a purplish tint is again obtained; then add the remaining eighth part of the original solution to restore the pure blue color, or, which is more delicate as a test for acidity, a very faintly purple blue color; then dilute this solution either with water, or with the second liquid from the litmus sediment, until a slip of neutral white paper dipped into it has a pale blue or pale purplish blue color. Here it is necessary to remember that this paper when dry is many shades paler than when wet, and the dilution should be made accordingly. The solution making red litmus paper will not bear the same amount of dilution as that for the blue, and must be made of the proper purplish red color by the addition of dilute acid before dilution. The solutions so made will keep almost indefinitely, and may be passed on from one process to the next. The paper should be made from pure rag stock—not from bleached wood nor straw—should be quite white, and above all, must be quite neutral, and show no red spots or blotches when moistened with the blue solution. French or German filtering paper commonly answers well if of good quality. This is cut into convenient size, the larger the better, because there is less waste, and held by two corners, which corners are to be kept dry; it is to be skillfully laid on the surface of the solution, first one side and then the other, then drained, and hung over clean glass tubes to dry. The vessel to hold the solution for dipping should be larger than the sheet of paper, and shallow.

The sheets when dry are laid together, and the edges trimmed off all round. They are then cut into sheets 3 to 4 inches wide and 12 to 18 inches long, according to the size of the paper used What is sold as "a sheet of litmus paper" should never be less than 4 inches by 12, or 3 by 18. Such a sheet cut lengthwise through the middle gives a strip which, when cut crosswise into strips a quarter or three eighths of an inch wide, is of a convenient size and form for use. The sheets, one paler and one deeper of the same color, if desired, should be rolled up together in a tight roll, slipped into a test tube and corked. In corked test tubes they keep unchanged for an indefinite time, while the test tubes when empty and corks are always worth their cost to those who use litmus paper.

In this form of sheets, however, the paper is not so convenient for the physician as when cut into strips 1 to 2 inches long and a quarter of an inch wide; and the writer finds that about 100 of such strips, put up in a wide mouth tube vial, corked and properly labeled, is a most convenient and popular form for physicians' use. One such vial of each color put up together forms a pair which no physician should be without. And most physicians will buy them if they can get them. These convenient little strips may be shaken out of the vial as wanted for use, but as the fingers, should, by rights, never touch any other strip than the one taken, it is best to take them from the vial by a pair of forceps from the physician's pocket case.

BROWN'S IMPROVED BEEHIVE.

As the embodiment of a long experience in apiculture, the accompanying invention will doubtless prove a valuable acquisition to all engaged in that industry. The inventor has aimed to so construct a hive as to prevent the diseases



to which bees are subject in changeable climates, and in winter to keep their dwellings sufficiently warm, so that the young insects may not be destroyed by the cold. Free ventilation in the breeding chamber is provided, and the hive generally is constructed in close imitation of the abode of the bees in their natural state.

Fig. 1 represents a perspective view of the house and hive; Fig. 2 a sectional plan, and Fig. 3 shows the interior of the chamber for holding the honey boxes. The house, Fig. 1, is constructed with a movable roof or lid, and with two shutters, A, which can be raised and folded back, designed to be closed in winter and opened in summer, and B, by which access may be had to the honey receptacles. Between the floor and the shutter there is about one quarter of an inch of space left in order to insure a supply of fresh air. The floor is movable. Fastened longitudinally in the interior are cleats, C C, Fig. 2, which support the hive in place. The legs are provided with inverted cups or flares to prevent the ascent of mice, etc.

The hive proper is arranged with perpendicular sides. The bottom consists of two inclined portions, D and E; D, the front, has a sliding cover whereby the size of the bee aperture may be regulated, and is provided with a small notch at F for ventilation when closed. The rear portion, E, is hinged to the hive, its forward inclined part constituting a lighting board for the bees. G, Figs. 2 and 3, is the diaphragm dividing the breeding from the honey chamber. It is pierced, as shown more clearly in Fig. 3, with two rectangular orifices in the center, which communicate with similar holes in the bottom of the honey boxes, H. The inventor has found, through long experience in the management of bees, that the eggs of the bee moth are always deposited around the corners of the hive. In order to remove these nuisances, and so to protect the bees from their ravages, he provides the four corner orifices, I I, in the diaphragm, G, which, whenever necessary, he scrapes with the instrument shown in Fig. 4, thus detaching the cocoons; after which, by means of a small swab, he covers such portions with a strong solution of brine, also applying the same liquid to the bottom of the hive. This operation requires but a few minutes, and may be accomplished without moving the hive or disturbing the bees. The corner orifices, when not thus used, are covered with wire gauze. The upper part of the hive is closed with a movable lid, K, and front, L, which should not be left in position except when feeding a late swarm that have not secured sufficient honey for their maintenance.

Fig. 1 represents the device arranged for summer use, that is, with doors open and lid of hive removed. In winter time these portions are all closed, and the two inch space between the hive and walls of the house is packed with straw so as to secure warmth.

The inventor claims that the apparatus, with proper management, will prevent the vitality of the eggs being destroyed by cold, obviate the foul brood caused by chill and dampness (leaving a black and decomposed mass liable to kill the entire colony), and lead to early swarms and an abundance of honey. The device is simple and durable, and is well worthy the attention of bee keepers throughout the country.

Patented September 10, 1872. For further particulars regarding sale of entire right, etc., address the inventor, Mr. Peter Brown, Taylorville, Ill.

Telegraphic Experiment.

Mr. Highton describes in the *Chemical News* the following experiment: On November 4, the cable from Dover to Boulogne was broken by a ship's anchor, about 5 miles from Dover. By the kind permission and co-operation of Mr. Bourdeaux, the engineer of the Submarine Telegraph company I placed my instrument (shown lately to the Society of Arts) between the end of the broken cable at Dover and the water pipes of the town. To our surprise we could distinctly read every message to and from Ostend, Calais, and Dover, on the Dover and Ostend and Dover and Calais cables. The explanation was as follows: Part of the electrical current which went to earth at the Dover water pipes went on to a second earth formed by the end of the broken cable, and in its passage made signals on the instrument. Thus the enormous fault formed by the Dover water pipes was not sufficient to prevent a perceptible current of electricity passing on to the broken end of the Dover and Boulogne cable.

We also asked the French operator at Boulogne to send a current through the broken cable, and got a feeble result; but as we were not able, without special authorization from the French Government, to get him to put on such batteries and instruments at Boulogne as were necessary, and the remaining cables were fully occupied with messages, we did not follow out this portion of the experiment.

ATMOSPHERIC SUBMARINE POSTAL COMMUNICATION BETWEEN FRANCE AND ENGLAND.—E. Martin describes a modified plan, which consists in the use of a narrow tube through which simply microscopic photograms containing the dispatches, produced upon collodion, are to be transmitted. It appears that this method of operating was first used during the late siege of Paris, and has now been improved upon. The execution of these microscopic photograms can be conducted by day or at night by the aid of the electric light. The tube through which these light pellicules are to be transmitted need only be some few centimeters in diameter. The motion is imparted by compressed air.

AMERICAN IRON.—The Philadelphia *North American* says: "Certainly, if a country so limited in extent as Great Britain should dominate the iron trade of the world, as she has long done, we can, with our immense wealth of iron and coal, and our fast accumulating capital, do that much. Twenty years hence, if we are true to ourselves in the meantime, the American iron product will reach eight or ten millions per year, and we may even be able by that time to export a tun of iron for every bale of cotton. The era of cotton and wheat in American commerce has been a great one. But the era of iron now dawning upon us is destined to be far greater."