

Disinfectants and How to Use Them.

The National Board of Health, consisting of a number of our leading physicians and chemical experts, of which Prof. C. F. Chandler is chairman, have issued the following instructions for disinfection, intended especially for the guidance of physicians and nurses in the yellow fever districts, but which are equally applicable in other classes of contagious diseases. In submitting this report the chairman says:

It has been the aim of the committee to prepare concise directions for disinfection, so simple and clear that they may be easily followed by any person of intelligence.

In the selection of disinfecting agents the aim has been: 1st, to secure agents which can be relied upon to accomplish the work; 2d, which can be procured in a state of comparative purity in every village in the United States; 3d, so cheap that they can be used in adequate quantities.

It is extremely important that the people should be instructed with regard to disinfection. They must be taught that no reliance can be placed on disinfectants simply because they smell of chlorine or carbolic acid, or possess the color of permanganate, and that, in general, proprietary disinfectants with high-sounding names are practically worthless, as they either have no value whatever, or, if of value, cost many times as much as they are worth, and cannot be used in sufficient quantity.

EXPLANATIONS.

Disinfection is the destruction of the poisons of infectious and contagious diseases.

Deodorizers, or substances which destroy smells, are not necessarily disinfectants, and disinfectants do not necessarily have an odor.

Disinfection cannot compensate for want of cleanliness or of ventilation.

I.—DISINFECTANTS TO BE EMPLOYED.

1. Roll sulphur (brimstone) for fumigation.
2. Sulphate of iron (copperas) dissolved in water in the proportion of one and a half pounds to the gallon; for soil, sewers, etc.
3. Sulphate of zinc and common salt, dissolved together in water in the proportions of four ounces sulphate and two ounces salt to the gallon; for clothing, bed linen, etc.

NOTE.—Carbolic acid is not included in the above list for the following reasons: It is very difficult to determine the quality of the commercial article, and the purchaser can never be certain of securing it of proper strength; it is expensive, when of good quality, and experience has shown that it must be employed in comparatively large quantities to be of any use; it is liable by its strong odor to give a false sense of security.

II.—HOW TO USE DISINFECTANTS.

1. *In the Sick-Room.*—The most available agents are fresh air and cleanliness. The clothing, towels, bed linen, etc., should at once, on removal from the patient, be placed in a pail or tub of the zinc solution, boiling hot if possible, before removal from the room.

All discharges should either be received in vessels containing copperas solution, or, when this is impracticable, should be immediately covered with copperas solution. All vessels used about the patient should be cleansed with the same solution.

Unnecessary furniture—especially that which is stuffed—carpets, and hangings, when possible, should be removed from the room at the outset; otherwise, they should remain for subsequent fumigation and treatment.

2. *Fumigation with sulphur* is the only practicable method for disinfecting the house. For this purpose the rooms to be disinfected must be vacated. Heavy clothing, blankets, bedding, and other articles which cannot be treated with zinc solution, should be opened and exposed during fumigation, as directed below. Close the rooms as tightly as possible, place the silver in iron pans supported upon bricks, set it on fire by hot coals or with the aid of a spoonful of alcohol, and allow the room to remain closed for twenty-four hours. For a room about ten feet square, at least two pounds of sulphur should be used; for larger rooms, proportionally increased quantities.

3. *Premises.*—Cellars, yards, stables, gutters, privies, cess-pools, water closets, drains, sewers, etc., should be frequently and liberally treated with copperas solution. The copperas solution is easily prepared by hanging a basket containing about sixty pounds of copperas in a barrel of water.

4. *Body and Bed Clothing, etc.*—It is best to burn all articles which have been in contact with persons sick with contagious or infectious diseases. Articles too valuable to be destroyed should be treated as follows:

- a. Cotton, linen, flannels, blankets, etc., should be treated with the boiling hot zinc solution, introducing piece by piece, securing thorough wetting, and boiling for at least half an hour.
- b. Heavy woolen clothing, silks, furs, stuffed bed covers, beds, and other articles which cannot be treated with the zinc solution, should be hung in the room during fumigation, pockets being turned inside out, and the whole garment thoroughly exposed. Afterward they should be hung in the open air, beaten, and shaken. Pillows, beds, stuffed mattresses, upholstered furniture, etc., should be cut open, the contents spread out and thoroughly fumigated. Carpets are best fumigated on the floor, but should afterward be removed to the open air and thoroughly beaten.

5. *The corpses* should be thoroughly washed with a zinc solution of double strength, then wrapped in a sheet wet with the zinc solution, and buried at once. Metallic, metal-

lined, or air-tight coffins should be used when possible, certainly when the body is to be transported for any considerable distance.

A NEW PUNCHING AND SHEARING PRESS.

In our last issue we gave a brief description of a press somewhat larger and heavier than that represented by the accompanying engraving. The working principle is the same in both, the power being obtained by the swing of a weighted pendulum at the back of the machine in combination with a shaft, automatic clutch, and slide.



"PEERLESS" PUNCH AND SHEAR PRESS No. 2.

In this machine the pendulum is kept in motion by foot pressure upon the treadle, and it punches easily a three eighths inch hole in one quarter inch iron, and an inch hole in one eighth inch plate, six inches from the edge. It is designed to do boiler-makers' small work, as well as for the use of sheet metal workers, and especially brass manufacturers. The opening in the bed is six and a half by four inches.

The press weighs 380 lb., and, with the exception of the pendulum and treadle, is in all respects similar to power presses used for the same purposes. With it a boy can easily do all the work by foot as rapidly as by power press and without fatigue. The pendulum can be readily removed and a balance wheel attached to the shaft for power when desired.

To test the capacity of one of these small presses, the manufacturers state that they attached a thirty inch balance wheel, with three inch belt, to the shaft, and with a speed of 125 revolutions per minute they could not punch an inch hole in one eighth inch iron; while the pendulum, worked by foot alone, enabled the machine to punch such holes rapidly and continuously.

This press stands about four feet high, occupies comparatively little space, and seems very substantial. The punch may be easily removed, and a shear may be inserted in the slide for shearing light sheet metal.

These presses are protected by several patents, and are made by the Peerless Punch and Shear Company, 52 Dey street, New York city.

NEW FLANGE COUPLING.

The annexed engraving represents an improved flange coupling recently patented by Mr. Charles H. Cushing, of



CUSHING'S FLANGE COUPLING.

Tidioute, Pa. It is designed for connecting sections of pipe at any angle to each other, from a straight line to an angle of 90°.

The invention consists of two circular plates, each flat upon one side, and having on the other a short internally threaded tubular projection inclined at an angle of 45° to the plane of the plates. The plates are slotted to receive the bolts that fasten them together. This coupling serves as an elbow for pipe and for forming in pipes a joint of almost any desired angle.

A FEW WORDS TO YOUNG STEAM FITTERS.

BY A STEAM FITTER.

Feed Pipes.—The feed valve should be a globe or angle valve placed near the boiler, with the fewest possible joints in the feed pipe between it and the boiler. If it is a loose or swivel disk valve, it should be secured with solder (sweated in) in the threads of the double part of the disk, so as to make it almost impossible to lose the disk from the stem; a mark with a center punch or chisel is not enough. The valve should be so turned toward the boiler that the inflowing water will be under and against the disk, so that in the case of the loss of the disk it will not act as a check valve against the influx of the feed water. This arrangement will bring the pressure of the water in the boiler always against the stuffing box of the valve; but all things considered it is best.

The check valve should be close to and outside the feed valve, with only a nipple between them. Always use horizontal check valves, as they admit of easy cleaning. With the ordinary vertical check it makes it necessary to take down some part of the feed pipe to clean it.

When two or more boilers are fed from the same pump, or when the pump is used for pumping water for some other purpose, it is well to have a stop valve on each side of the check valve, as it will enable the engineer to get at his check without stopping the water to the other boilers or elsewhere.

In passing through boiler walls or cast iron fronts, care should be taken that the feed pipe does not nest, or the settling of the boiler will break it off.

Use a flange union on the feed pipe instead of the common swivel union; the engineer can take it apart with a monkey wrench, and it makes a more permanent job and it will not leak.

Never put a T in the feed pipe inside the feed valve for the purpose of a blow-off; make a separate connection to the boiler.

Blow-off Cocks.—Never use anything but a plug cock of the best steam metal throughout. The reasons for using a cock are that the engineer is always sure when he looks at it whether it is shut or open. It gives a straight opening; if chips, packing, or dirt gets into the cock it will shear them off when closing, or if it does not, the engineer knows it is not shut. Do not use an iron body cock with brass plug, for when the cock is opened to blow down a little the hot water expands the plug of the cock more than the body, and it is almost impossible to close it. Do not use a globe or angle valve, as you cannot always tell when it is shut; a chip or dirt getting between the disk and seat will prevent its closing. I have seen two fine boilers destroyed from this cause. Gate or straight-way valves are subject to the same objections as globe or angle.

When it is practicable there should be a T with a plug in it in the blow-off pipe outside the blow-off cock, the plug to be removed when the cock is closed. By this means the engineer can always tell if he is losing water from his boiler.

The blow-off pipe should be large, with few bends in it, and fire bends are better than elbows. It should be attached to the bottom of the shell of a horizontal boiler, and not tapped into the head a few inches up. When there is a mud pipe, attach it to it at the opposite end from the feed pipe.

Safety Valves.—They are the main stay of the engineer, acting both as a relief and a warning signal. They should be attached to the steam dome high up. At the side is better than the top, as they are not so liable to draw water when blowing off in that position. They should be large and have a large pipe connection all to themselves. The ordinary cross body safety valve is very much to be condemned, and I think in some countries there are regulations against their use; they are constructed to save making an extra connection for the main steam pipe, thereby drawing the largest amount of steam directly from under the disk of the safety valve. A weighted safety valve is better than a spring valve when it can be used, as the lifting of the valve makes practically no difference in the leverage; not so with a spring valve, for the higher it is lifted the more power it takes to compress the spring.

Gauge or Try Cocks.—Gauge cocks are various in style, the wood handle compression gauge cock being a very good kind for all purposes. When setting gauge cocks care should be taken that they are not too low, and that the drip will not flow over the person who tries them. They should be tapped directly into the boiler if possible; but when it is necessary to use a piece of pipe to bring them through a boiler front or brickwork, give the pipe an inclination backward, that the condensation may run back and into the boiler. When the pipe inclines outward and down, the condensation remains in it and the cock, and will deceive the unwary, giving the appearance of plenty of water with a short blow.

Glass Water Gauges.—Water gauges are best set when attached to a vertical cylinder at the front of the boiler. The cylinder should be connected to the boiler with not less than one inch pipe, top and bottom; the top or steam connection should be taken from the boiler shell near the front head, and not from the dome or steam pipe, as the draught of steam in either will cause the glass to show more water