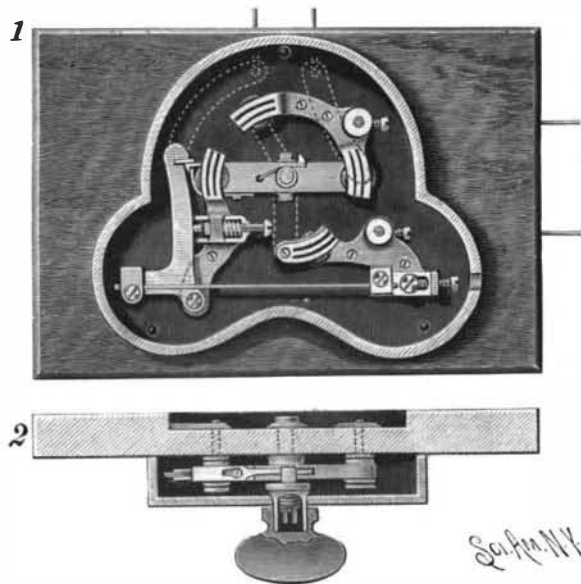


AN IMPROVED ELECTRIC SWITCH.

The illustration represents a simple and effective switch which may be used as an ordinary switch and also as a cut-out for preventing the passage of an excessive current to a particular portion of the circuit. The improvement has been patented by Henry B. Whitehead, of No. 57 Madison Street, Memphis, Tenn.



WHITEHEAD'S ELECTRIC SWITCH.

Fig. 1 represents a vertical and Fig. 2 a horizontal section of the switch, whose base is of insulating material, recessed at the back to receive the electrical connections, while a cover fits over the working parts. On a stud projecting from the base is fulcrumed a spring-actuated switch arm adapted to be engaged by a detent lever, while a spring tends to disengage the detent lever from the arm. An expansion wire, used as a conductor, is arranged to normally hold the detent lever in engagement with the switch arm, but releases the lever when the wire is expanded by heat due to excessive current. A key, having a fork loosely embracing the lever, has a thumbpiece outside the cover, whereby the switch arm may be released from the detent lever and turned by hand.

Keep Your Mouth Shut.

The Family Doctor says that this is the secret of avoiding colds. The man or woman who comes out of an overheated room, especially late at night, and breathes through the mouth, will either catch a bad cold or irritate the lungs sufficiently to cause annoyance and unpleasantness. If people would just keep their mouths shut and breathe through their noses, this difficulty and danger would be avoided. Chills are often the result of people talking freely while out of doors just after leaving a room full of hot air, and theatergoers who discuss and laugh over the play on their way home are inviting illness. It is, in fact, during youth that the greater number of mankind contract habits or inflammation which make their whole life a tissue of disorders.

It is stated that a "Fine Arts and Industrial Exhibition" will be held at Barcelona, beginning on the 23d of April next. An international exhibition will also be held in Brussels in 1897.

AN INSULATOR FOR ELECTRIC WIRES.

To prevent the humming noise caused by the vibrations of electric wires when they are fastened to poles or other supports, the insulator shown in the illustration has been devised and patented by Magin Riera, of Apartado 649, Havana, Cuba. Fig. 1 represents the insulator as attached to a support in use, Figs. 2 and 3 showing its clamping pieces, and Fig. 4 its central elastic insulating portion. The contacting surfaces of the clamping members are concaved and convexed respectively, or have a wedge-shaped projection and a corresponding recess, and they inclose between them an elastic filling slotted to about its center to receive the wire, the clamping pieces causing the split portion of the filling piece to closely hug the wire.

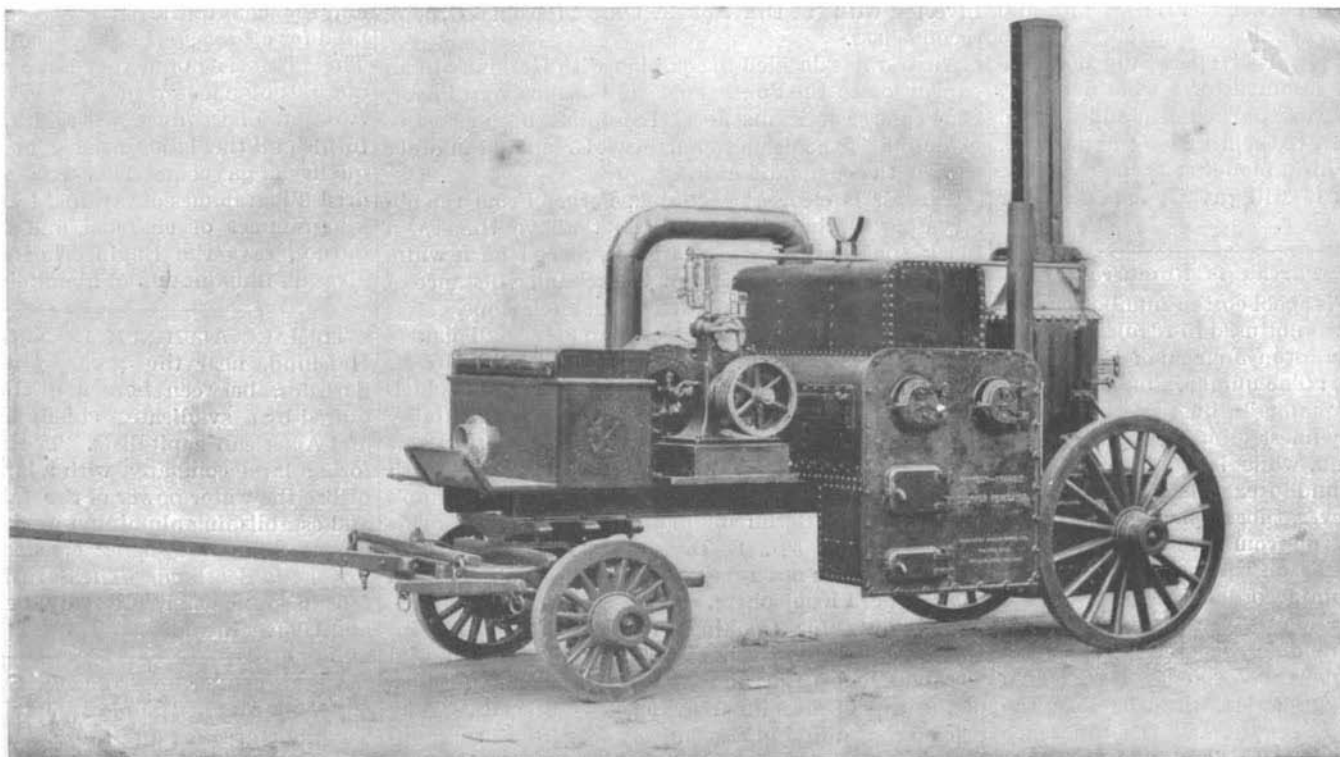
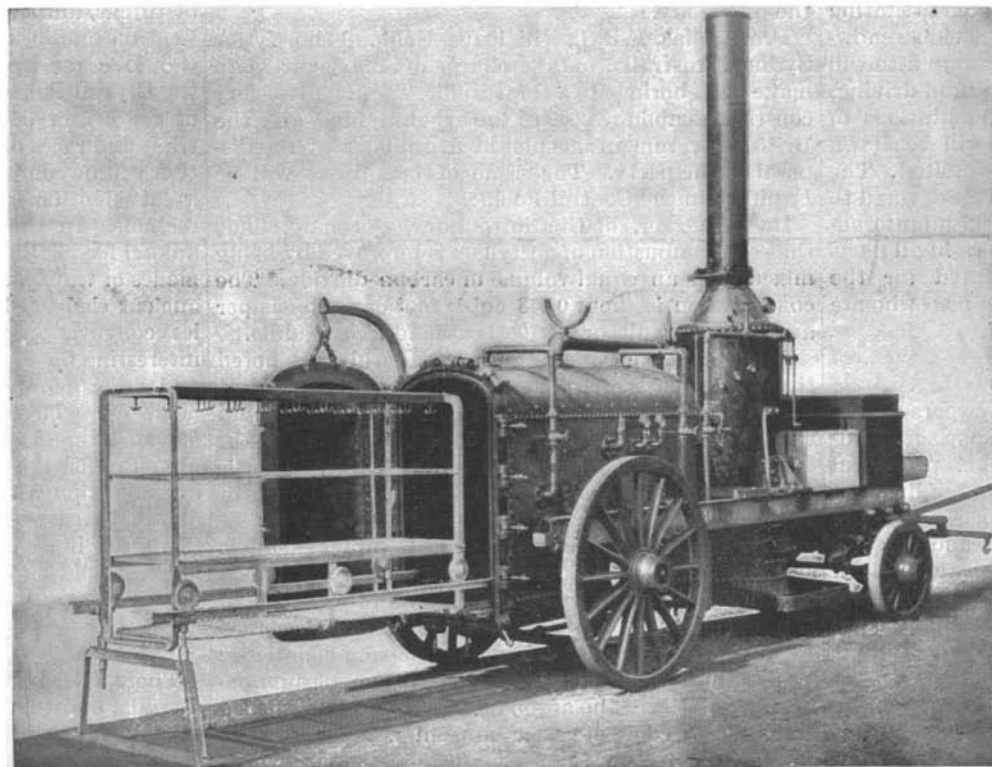
A PORTABLE DISINFECTING PLANT.*

BY W. H. FRANCIS, PHILADELPHIA, PA. (M.A.S.M.E.)

In military science it is an axiom to defeat and destroy an army in detail; this is equally applicable to fighting contagious disease, and is attracting marked attention from sanitarians. It is not the province of the mechanic to discuss or pass upon the microbe theory, calling for disinfecting machines, but to apply practically, for everyday use, the facts which bacteriologists and doctors have proved to be true.

At the December meeting of 1893 was presented a paper on "A Modern Disinfecting Plant," as applied to quarantine stations, to prevent contagion reaching our shores. Supplemental to this article a brief description is now offered of a portable disinfecting plant for destroying epidemic disease in detail, upon its first appearance in our cities. These machines are the outgrowth of a study of the epidemic of yellow fever at Brunswick, Georgia, and the indifferent means the doctors had to improvise to aid them in the fight, although, it is true, these were the best that could be obtained at the time in a city cut off by strict quaran-

* Presented at the Detroit meeting of the American Society of Mechanical Engineers, and forming part of volume xvi of the Transactions.

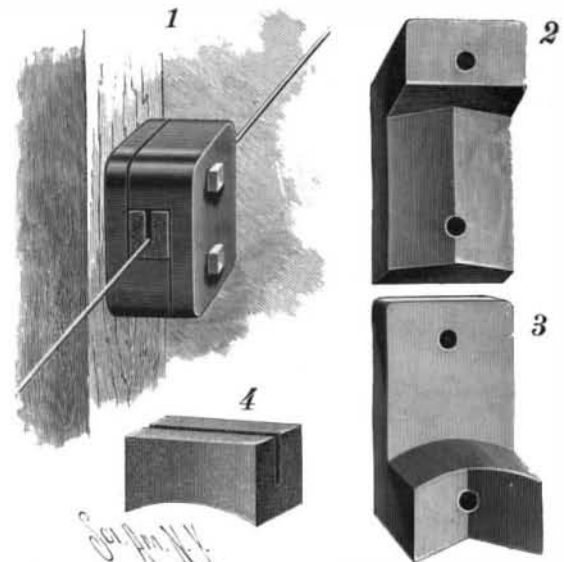


A PORTABLE DISINFECTING PLANT.

time. For instance, a box car on one of the railroads was hastily transformed into a steam chamber, steam being provided by the locomotive, and infected articles carried long distances to and from the car. It is greatly to the doctors' credit that with such means they were able to check the ravages of the fever.

The portable plant comprises two machines:

First, the steam disinfector, consisting (as seen by



RIERA'S INSULATOR.

examining the upper cut) of a jacketed chamber, car, boiler, and vacuum pump, mounted upon a suitable running gear. Its operation is as follows:

The steam generated in the boiler at high pressure is reduced by proper valve, circulating in the jacket at low pressure during the entire operation. The infected clothes are placed upon screens, or hung on

hooks in the car, which is supported by a portable track, adjustable for irregularities of roadway, the car then being pushed into chamber, and the door, swinging on crane, closed and bolted, made steamtight by a rubber gasket. A thermometer records the temperature, and when the clothes have reached that of the low pressure steam the vacuum pump is started, removing the air (the object of which is twofold, to prevent possibility of life to the microbe and to give steam greater penetrating effect), after which the steam is admitted to the chamber from the jacket, insuring circulation. The incoming steam strikes upon a three-leaf hood, to prevent being forced directly upon the clothes, and any condensation is carried down the sides of the chamber, preventing wetting and consequent shrinkage of woollens. The exposure is continued for varying time, according to the character of the infected articles, after which

the steam in the chamber is discharged through a valve, the door opened, and the car withdrawn.

The car is arranged with removable trays and is open-sided, so as to hold either single or double mattresses, wooden guards of cypress being introduced to prevent them from projecting beyond the sides of the car.

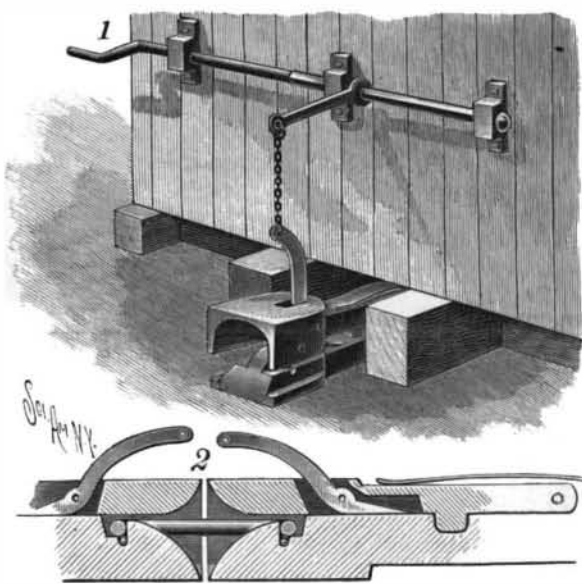
Second, the sulphur fumigator, consisting of a furnace, boiler, engine, and fan, mounted on wheels, as seen in the lower cut. The sulphur furnace is double, with a firebox at

one end, the sulphur being held in a cast iron pan, under slow combustion, to produce the dioxide; and to continue the operation without opening the doors and causing rapid combustion, a double-winged stoker is provided by which additional roll sulphur can be introduced to the pan. The fumes travel through the double furnace to a reservoir on top, provided with baffle plates, and are then sucked by exhaust fan (driven direct by a rapid-speed engine), thence through hose into the building being fumigated, the quantity being regulated by a sliding gate valve. Both these machines embody the same principles described in previous paper, and are intended, in case of infection appearing in a certain quarter, to be driven to the infected house, and after the patient's removal, all bedding, clothing, etc., be disinfected in the steam disinfector, after which the house itself be thoroughly disinfected by the sulphur fumigator.

These machines were designed for the United States Marine Hospital Service by Dr. Walter Wyman, Supervising Surgeon-General, in association with Dr. J. J. Kinyoun, one of the able bacteriologists in the bureau.

AN IMPROVED CAR COUPLING.

The engraving represents a coupler adapted to automatically couple cars as they come together, the uncoupling being readily effected by means of a releasing attachment from the side of the car. Fig. 1 is an end view of a car body on which the improvement is applied, Fig. 2 being a sectional side view of two of the couplings in coupled connection. The drawhead and drawbar are formed in two hinged portions, and the lower or main section has centrally at its forward end a latch hook, there being at each side of the hook a level portion or seat on which the coupling link rests. The upper section of the coupling fits in an open recess



SMITH'S CAR COUPLING.

in the lower section, and has at its front end parallel depending flanges embracing the side walls of the drawhead portion of the lower section. In the bottom of the latch hook recess is a groove in which is a lifter bar whose ends are secured in the flanges of the upper section, the latter being held normally depressed by a plate spring, and the insertion of the link, as it

passes over the coupling hook, lifts the upper section against the tension of the spring, which holds the inserted link in level position, with the lifter bar below its inner end. To release the link in uncoupling, a curved lever is pivoted in a longitudinal slot in the upper section, the toe of the lever having a bearing on the lower section, while its other end is connected by a chain with a transverse shaft on the end of the car. The shaft has a crank handle at the side of the car, and by moving the crank the upper section and the lifter bar are raised to release the link from engagement with the coupling hook. To hold the upper section and lifter bar in raised position, the transverse shaft is formed with a squared portion adapted to interlock with a square locking box, on pushing the shaft endwise, the link being then held in uncoupled adjustment for withdrawal. This improvement has been patented by John F. Smith, of Burbank, Ohio. It will be observed that, in cars equipped therewith, the coupling link may be easily placed to couple automatically with an approaching car, and that the trainmen do not have to go between the cars, in uncoupling them.

A NEW RECORDING THERMOMETER FOR ATMOSPHERIC RANGES OF TEMPERATURE.

The novel and especially valuable feature of the recording thermometer herein described is that the recording portion may be located at a distance of twenty-five or thirty feet from the point at which the temperature is to be measured.

This makes it possible to obtain a continuous record of the outside temperature while the recorder is located at a convenient point within doors where it may be readily observed and its mechanism is not exposed to the detrimental influences of inclement weather. For cold storage plants where closed rooms are to be maintained at a constant temperature for the preservation of meats, fruits, and vegetables, an instrument of this kind is of great value, as the temperature may be observed without opening the doors.

The recording part (Fig. 1) is an application of one of Bristol's recording pressure gages. Fig. 3 shows an interior view of the recorder, which consists of a pen arm directly attached to the free end of a tube of flattened cross section bent into helical form.

The bulb portion (Fig. 2) is placed at the point where temperature is to be measured. It consists of a series of helical tubes constructed on the same principle as that in the recorder. The helical coils are suspended in a vertical position with their lower ends free, the upper ends opening into the capillary tube connecting them with the recorder.

The system of helical tubes forming the bulb portion, the pressure tube of the recorder and the capillary connecting tube are completely filled with alcohol under pressure and permanently sealed. As the temperature rises and falls where the bulb is located, there is a corresponding expansion or contraction of the alcohol which is communicated to the recorder and registered on a seven day chart graduated to read in degrees Fahrenheit.

Excessive pressures due to increased volume of the non-compressible liquid are provided against by the expansible form of the system of helical tubes of which the bulb is constructed. The total volume of the bulb portion is very large as compared with that in the pressure recorder, thus avoiding the necessity of compensating for ordinary changes of temperature in

the room where the recorder is located. No correction is required for barometric changes, as only high ranges of pressure are employed.

This thermometer is being manufactured by the Bristol Company, of Waterbury, Conn. One of the



FORWARD'S MECHANISM FOR PROPELLING BOATS.

instruments may be seen in operation recording the outside temperature at their New York branch office at 121 Liberty Street. The recorder is placed in the show window, where it may be observed from the sidewalk.

MECHANISM FOR PROPELLING SMALL BOATS.

A means of propelling small boats which enables the boatman to sit facing the bow, instead of looking rearward, as in rowing, is illustrated in the engraving, and has been patented by Walter Forward, of San Diego, Cal. The short propeller shaft in the rear of the boat has a wide pulley connected by two belts with three pulleys on a driving shaft, one of the belts being a crossed belt and the other a straight belt, and the center pulley being an idler. The driving shaft carries a fly wheel on the hub of which is a sprocket wheel, or a grooved wheel with pins in its groove, and an apertured belt engaging this wheel passes under a double pulley in the bottom of the boat, and forward, under the seat, around a similar wheel upon a shaft journaled in front of the boatman's seat. In front of the seat are parallel slideways, in each of which slides a block having a foot rest, and the blocks are each connected by a pitman with a crank on the driving wheel. By means of a belt shifter connected by a rod with a hand lever in convenient reach of the boatman, the belts connecting the drive shaft with the propeller shaft may be shifted so that the latter will be operated by either the straight or the crossed belt, to propel the boat forward or to back it, the driving shaft being continuously revolved in one direction by the alternate forward movement of the feet of the boatman pressing against the foot rests or pedals on the slide blocks. To facilitate adjusting the seat in the most convenient position forward or rearward, it is mounted on a racked or toothed support, the seat having a corresponding toothed portion for engage-

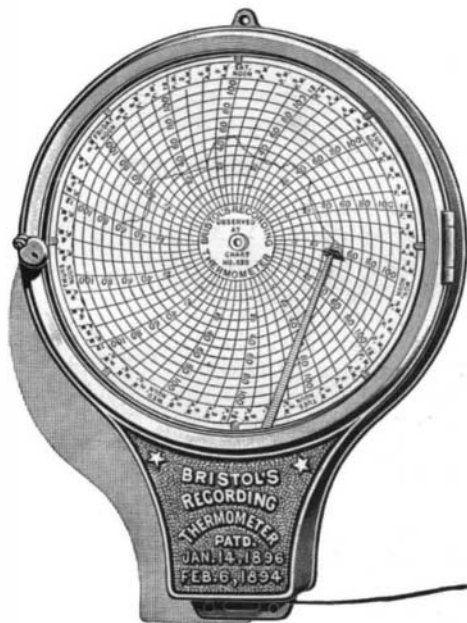


Fig. 1.

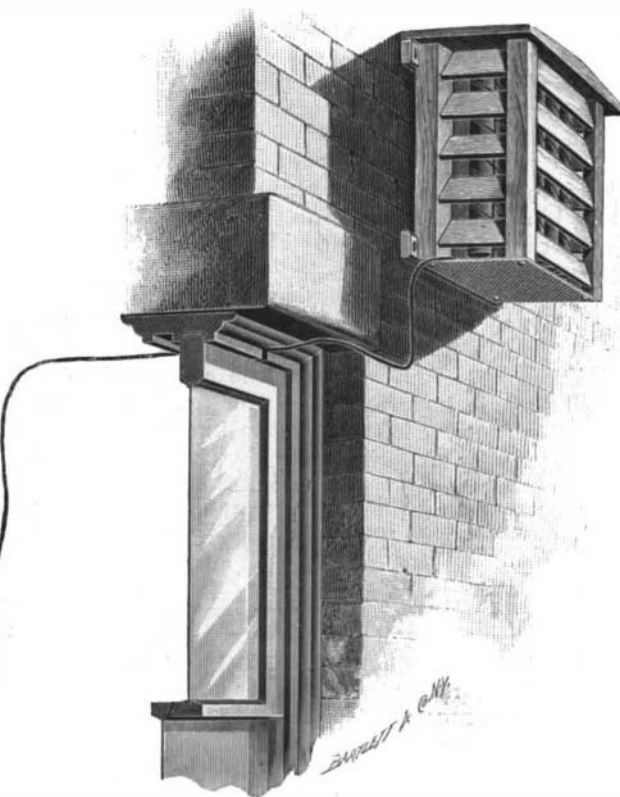


Fig. 2.

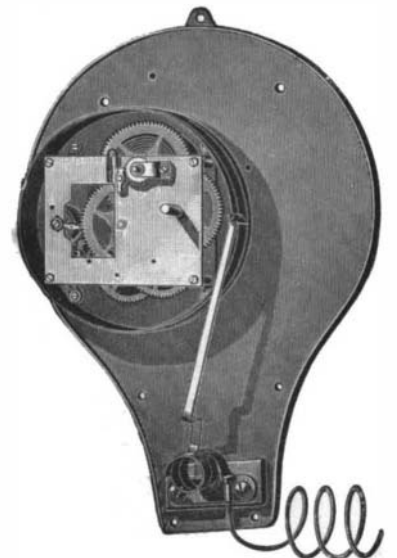


Fig. 3.

A THERMOMETER FOR MAKING AN INTERIOR RECORD OF THE OUTSIDE TEMPERATURE.