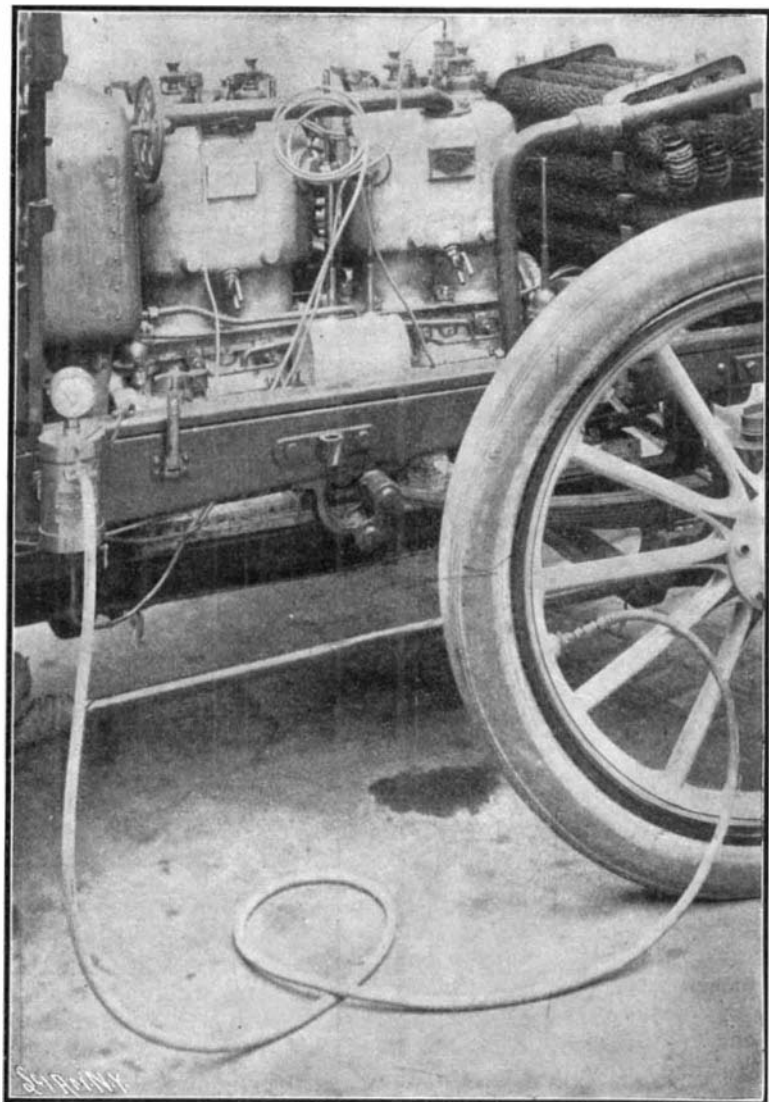


A NOVEL AUTOMATIC PUMP FOR INFLATING AUTOMOBILE TIRES.

BY THE ENGLISH CORRESPONDENT OF THE SCIENTIFIC AMERICAN.

Every automobilist is painfully aware of the arduousness, time, and manual labor involved in the inflation of pneumatic tires. With a view to overcoming this exhausting, and, to say the least, primitive system



AUTOMATIC AUTOMOBILE TIRE INFLATER.

for the inflation of tires, a novel and convenient apparatus, called the "Pompeesi," has been placed on the market by Messrs. Jarrott & Letts, Ltd., of London, who handle the American Oldsmobile runabout in Great Britain.

In this device manual labor is entirely dispensed with, for the process is accomplished entirely by the engine. Inflation is achieved by utilizing the force generated by the explosion of the gaseous vapor in the cylinder of the motor, in a simple and efficient manner. Furthermore, owing to the ingenious system adopted, it can be utilized with an engine comprising any number of cylinders, the work being as efficient with one cylinder as a multiple-cylinder engine. As will be recognized from the accompanying illustration, the device is small and compact, and constitutes a permanent fixture of the vehicle, being attached to the frame, dashboard, or any other convenient spot.

The apparatus consists primarily of a special plug-fitting. One of the ignition plugs is unscrewed and withdrawn from its place in the cylinder wall, and this special fitting is inserted. This special fitting, although it allows the ignition plug perfect and free communication with the combustion chamber, at the same time does not permit of its being screwed close against the cylinder wall. The fitting is a small metal box provided with a valve, which admits the consumed gaseous vapor from the cylinder after the explosion.

From this valve box extends a length of coiled steel tubing to the main part of the apparatus. A long section of pipe is provided, so that the hot gases may be sufficiently cooled before they enter the cham-

ber of the apparatus. This cylindrical chamber, which is made of nickel, is for the purpose of purifying the exploded gases. Within are placed a series of circular baffle plates with a narrow opening at one point of their peripheries, to admit of the gases traveling from one concentric passage to the other. The gas enters the purifying box in the center, and is forced around the circular baffle plates into the outside passage. This chamber serves a useful object in arresting all oil or other impurities that may be admitted from the combustion chamber of the motor, and which would prove deleterious to the fabric of the tire.

To the upper part of the cylindrical box is attached the flexible rubber hose leading to the valve of the tire.

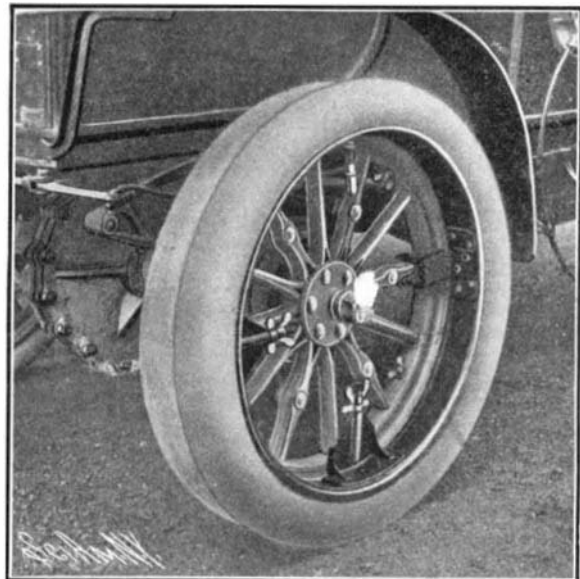
Owing to the fact that no interference is afforded to the combustion of the gases in the explosion chamber by the insertion of the ignition plug into the special fitting or valve box, this section of the apparatus can always be left in connection. When the operation of tire inflation is not in progress, the flexible India-rubber hose is disconnected from the cylindrical purifying chamber, and a cap screwed on to render it a perfectly tight joint.

To operate the apparatus, the engine is first stopped. The valve of the deflated tire is then connected to the fixed cylindrical purifying box by the flexible rubber tubing. The motor is started again. The greater part of the exploded gases in the cylinder to which the special plug is screwed pass through the inlet valve of the valve box at the plug. The valve then closes, and as the gases cannot escape back again, they pass through the coiled steel hose, cooling in transit, pass through the purifying chamber, and thence pass into the tire. When the desired pressure in the tire is attained, as indicated by the gage attached to the purifying chamber, the engine is stopped, and the flexible rubber tubing is disconnected.

When the engine is running, the exploded gases still escape for a time into the valve box; but as their passage is stopped when they reach the purifying chamber, the pressure behind the valve in the valve box soon becomes sufficient to prevent the valve opening and the gases escaping in that direction, and they therefore pass into the muffler or exhaust box in the usual manner. At the bottom of the purifying chamber is a small drain cock, through which any oil that may have collected in the purifying chamber may be withdrawn.

The "Pompeesi" has proved highly efficient in actual operation. It can be connected and set to work in ten seconds. The saving of time occupied in the inflation

of the tires, too, is considerably reduced, varying from two to three minutes according to the size of the tire. Experience has shown that the consumed gases of the explosive mixture exercise no deleterious effect upon the fabric of the tires. In fact, the reverse has proved to be the case, as they act more as a preservative. The tires furthermore stand inflated appreciably longer by this means, for the temperature of the gases is reduced to that of the outer atmosphere, which fact was proved in a special test, no fall in the pressure being observed on the gage after the tires had stood inflated for twenty-four hours. Owing to the simplicity of the device, there is nothing to get out of order. It can be as easily adapted to all engines, whether the plugs be fitted horizontally or vertically, or whether magneto ignition is employed. The device, which is of French



NOVEL SPARE WHEEL AND TIRE DEVICE FOR AUTOMOBILES.

origin, has been awarded the gold medal by the Automobile Club of France.

NOVEL SPARE WHEEL AND TIRE DEVICE FOR AUTOMOBILES.

An interesting reserve-tire device has been placed upon the English market. By this contrivance, instead of carrying a spare tire or tube ready for replacing a tire that fails through puncture or any other defect on the road, a complete rim and tire fully inflated ready for use is carried on the car. The device comprises a special rim carrying the tire, which is fully inflated. To this rim are fixed three clips. When a puncture occurs, instead of stripping the defective tire from the wheel, and substituting a new tire or repairing the defective one, this reserve wheel and tire is firmly clipped by thumb screws to the rim of the defective wheel. This wheel lifts the punctured tire off the ground and carries all the friction, so that the punctured tire is as safe as if it were withdrawn from the wheel.

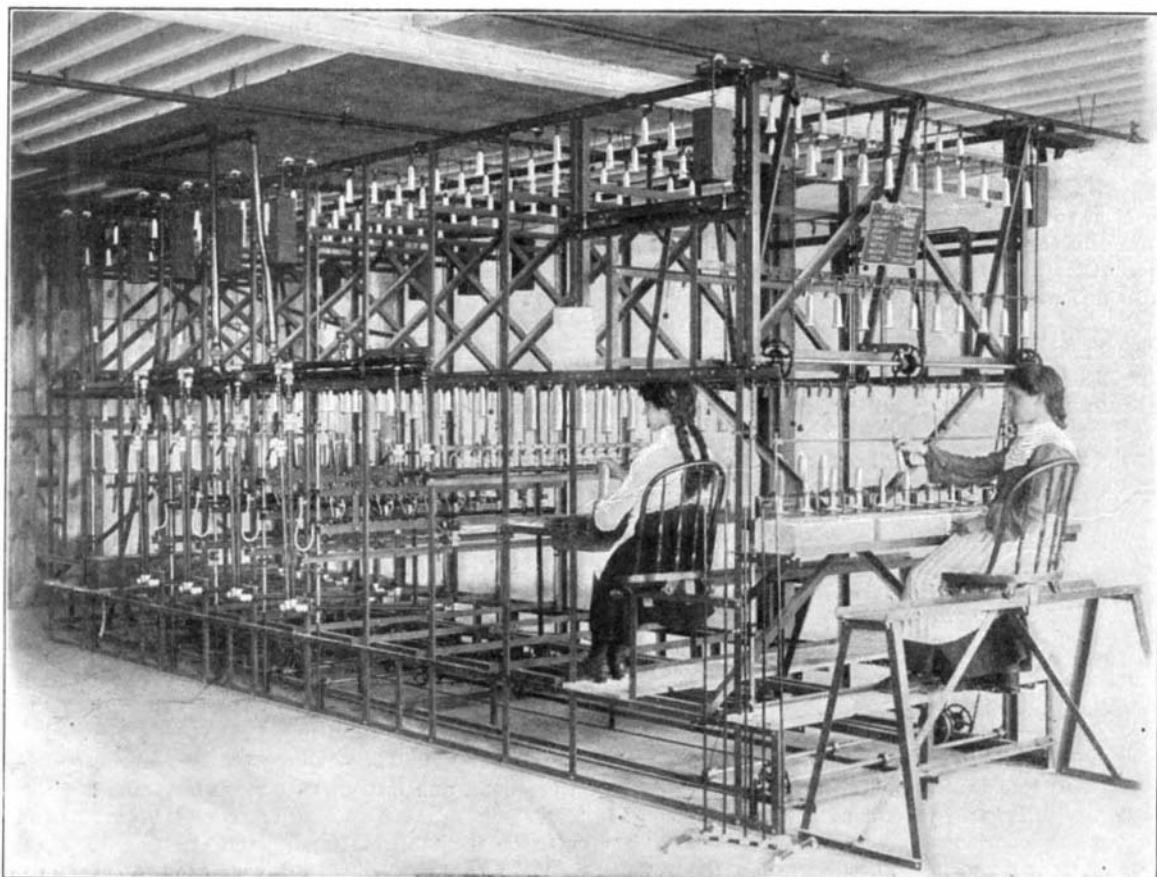
The advantage of this invention is that delay on the road through a failing tire is reduced to the minimum.

The spare tire and wheel only occupies one minute to attach in position and even tire inflation is dispensed with, as the tire is carried already fully inflated. The accompanying illustration shows the principle of the invention, and how it is attached. When carried, a hoop or ring is made the same size as the tire in order to clip it thereto. This appliance is the invention of Messrs. Davies Brothers, of Llanelly, Wales.

A MACHINE FOR AUTOMATICALLY MAKING INCANDESCENT GAS MANTLES.

In this country, at the present time, about forty million incandescent gas mantles are used annually. Vast as this quantity is, the industry in America is still in its infancy; and widely as the mantle itself has been introduced, the average user knows little of the composition of the mantle.

Briefly stated, a mantle is made as follows: A "stocking" is first knitted of cotton thread and then saturated with a solution of thorium.



THE ROBIN AUTOMATIC INCANDESCENT MANTLE-MAKING MACHINE; CAPACITY, 4,500 MANTLES PER WORKING DAY OF TEN HOURS.

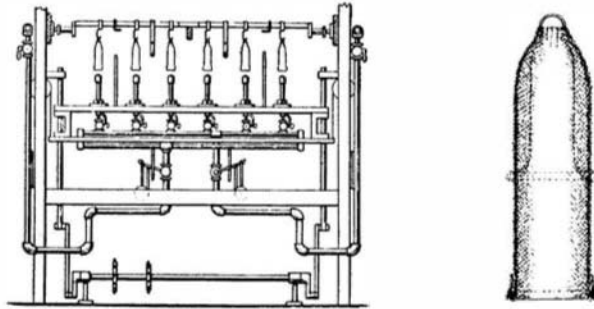
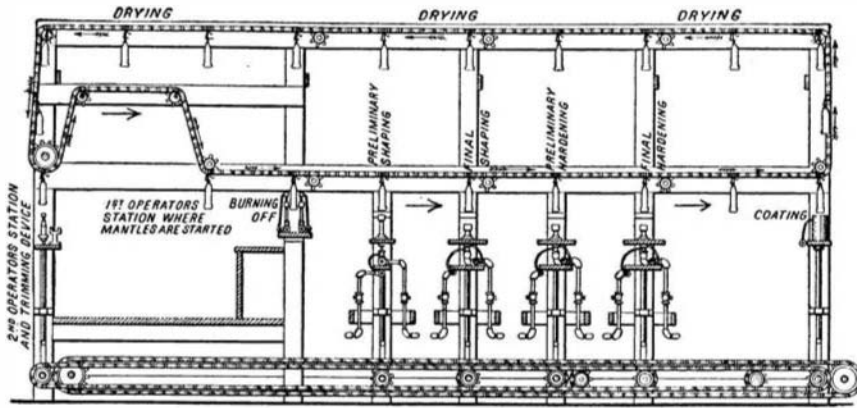
Thus impregnated, one of the stocking's ends is sewed up with asbestos thread, a loop being left by which the stocking is manipulated in the subsequent steps of the process. The sewed stocking is ignited at its top by a flame for the purpose of consuming the thread. After this treatment, all that is left is a reticulated structure consisting almost entirely of oxide of thorium. "Shaping and hardening" are the next stages through which the mantle must pass, both being effected by the Bunsen flame. Lastly, the mantle is dipped into a coating solution in order to protect it from breakage in transportation.

All these processes have hitherto been carried out by hand. The asbestos loop to which we have referred constitutes a means whereby a workman can pick up the mantle with a hooked rod and hold it over the Bunsen flame in shaping it. The percentage of losses incurred through imperfect shaping and breakage is high. The shaping and hardening of the mantle is accompanied by an unequal shrinkage which often renders the mantle unfit for use. Even if this did not occur, irregularities in the wall of the stocking may be formed, the result of imperfections in the thread, which cause unequal absorption of the impregnating thorium. In addition to these objections, expense naturally plays its part. The number of mantles which a single workman is able to burn off and shape in a day is necessarily limited. The number of imperfect mantles is large; consequently, the cost of the hand-made mantle is relatively high.

For the purpose of overcoming these objections, Mr. Joseph T. Robin, 258 Canal Street, New York city, has invented and patented what is probably the first machine for automatically making incandescent mantles. So successful has his apparatus been in actual operation, that it is fast taking the place of handwork in America and in Europe. A single machine is able to produce as many as four hundred and fifty perfect mantles per hour, and does the work of eight shapers, besides that of the dippers and others. Only two operators are required to serve the machine, one to place the stockings in position, the other to remove them after they are finished. An indicating device shows the exact number of mantles treated by means of the apparatus.

Naturally, the first improvement introduced by Mr. Robin in the process of making mantles was the prevention of irregularities caused by imperfections in the thread of the fabric. This difficulty Mr. Robin succeeds in overcoming by employing a metal ring, secured to the bottom of the stocking, which ring is of sufficient weight to lessen the contraction of the stocking during the operation of burning out. Furthermore, the ring prevents the formation of folds. In the accompanying diagram we illustrate a mantle, or rather an impregnated stocking, in which the full lines indicate the fabric before it is burnt off, and the dotted lines the form of the structure after the fabric has been destroyed. The ring clearly appears at the bottom of the mantle pictured in the diagram. Besides answering the purpose specified, the ring also serves to hold open the lower end of the stocking, so that the flames of the shaping and hardening burners can easily enter the interior, and to avoid the collapsing of the stocking during the dipping or coating process.

As shown in the accompanying photographic reproduction of an actual machine in operation, only two operators are needed. These operators are placed one in front and the other at one end of the machine. The operator seated within the machine has simply to hang the impregnated stockings by their asbestos loops upon the hooks of a series of carrier bars that intermittently move before her during the regular operation of the machine. Each carrier bar, by an ingenious arrangement of sprocket wheels and chains, is caused to move first over a set of burners by which the fabric of the stockings is burnt off; then to a set of burners by which the lower part of the mantle is shaped;



SIDE AND END ELEVATIONS OF THE AUTOMATIC INCANDESCENT MANTLE-MAKING MACHINE, AND A MANTLE WITH A RING, THE DOTTED LINES SHOWING THE AMOUNT OF SHRINKAGE.

after this, to another set of burners by which the upper portions are shaped; next, to a set of burners by which the mantles are hardened, and finally to a series of cups containing a coating solution, into which the mantles are dipped. Now practically complete, the mantles are elevated to the top of the framework of the machine, travel slowly toward the second operator, drying as they travel, and finally reach her,

whatever breakage does occur is due to the carelessness of the operator. Rarely is a mantle lost. The uniform excellence of the machine-made mantles, moreover, cannot be attained even by the most skillful operator.

DOMESTIC BATH PLUMBING.

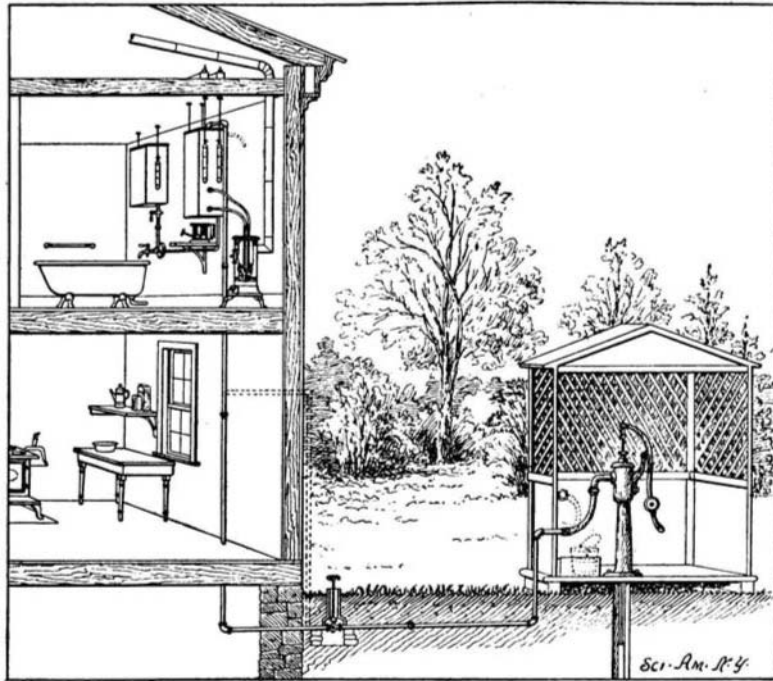
Throughout the country districts, one of the great needs of the residences—a convenient bathtub—is seriously felt. The absence of this adjunct is felt in every household; for there are no water mains in the roadways, no sewers to carry away the waste, no gas to heat the water. As for heating the water by the tea-kettleful on the kitchen stove, and carrying it to the tub, that is too tiresome, and destroys the anticipated pleasure.

In the accompanying illustration it is shown how up-to-date facilities for a bath may be secured at a reasonable cost; given, first, a good soft water supply from well or cistern near the house, and secondly, deftness of the householder's hands to screw the pipes together, from the water supply to the tub. All of these conditions fell to the lot of the writer in his country house, within twenty miles of New York city; and the illustrations show how the idea may be realized without the aid of a plumber.

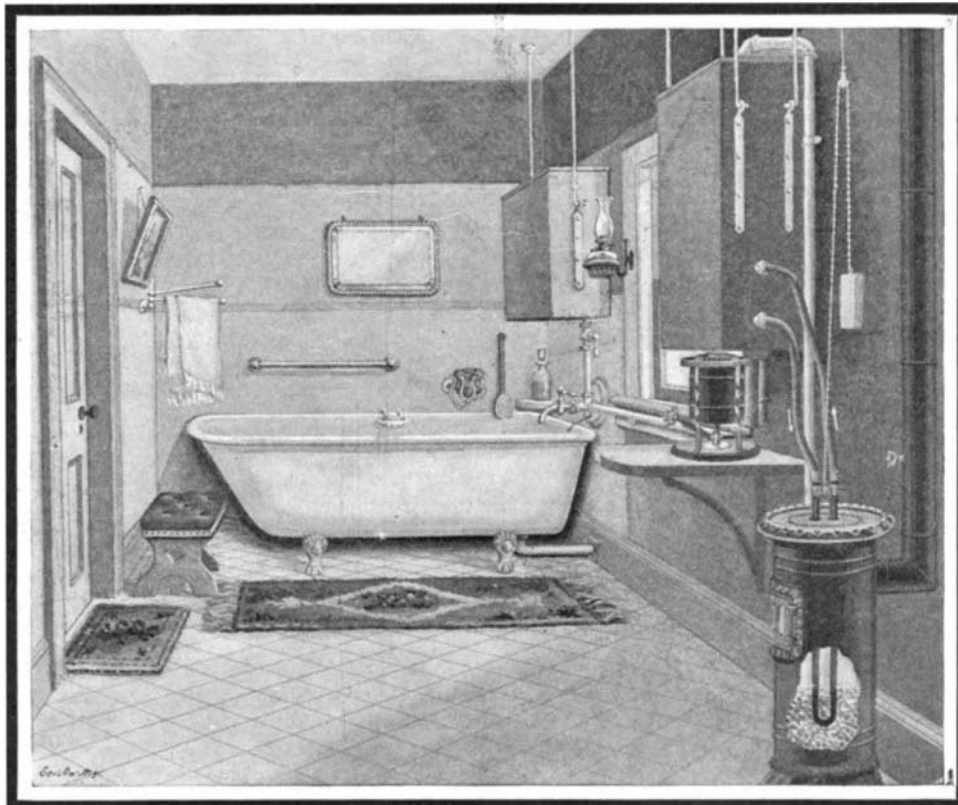
The cost (completed as shown) to the writer, was a trifle less than \$75. This outlay, for a permanent luxury, seems easily within reach of many on farm or roadside.

Having decided upon the location of the tub, in the interior of the house, measure accurately the distance from the water supply, where a 1 1/4-inch water pipe can be laid,

under the ground, through the side of the house or cellar, up to the floor on which the tub is to be located, and thence to an outlet into a suspended metal tank holding 30 gallons of water, and an additional pipe reaching from the bottom of the first tank to an auxiliary tank, as shown, having a capacity of about 20 gallons. The necessary elbows, stop cocks and waste cock for emptying the pipe of water during the winter's cold must also be allowed for. Send these measurements, with a rough diagram of the different courses and turns of the pipe, giving the lengths of each course in feet and inches, to some large plumbers' supply dealer for estimate of cost, including a porcelain-lined tub and copper-bottom, galvanized tank, the estimate to include threaded ends of pipe, threaded elbows, and cocks, all ready to screw together. The tanks for water should be for the larger 14 x 16 x 31 inches, the other 14 x 16 x 20 inches, cross-braced on the inside both ways to prevent bulging, a "tell-tale" 1/2-inch lead pipe soldered into a hole 1 inch from the top and long enough to pass through the side of the house, to overflow



METHOD OF OBTAINING HOT WATER IN A COUNTRY BATH-ROOM.



THE BATH-ROOM AND THE WATER HEATER.