

The water-supply is by a plunger feed-pump, run direct from the engine-shaft, and is kept at a uniform level in the boiler by means of a float connected to a valve in the suction of pump. This float is in a chamber which is connected by piping to the top and bottom of the boiler, and rises or falls with the water. The movement is conveyed by levers to the valve in the pump, which it opens or closes as the water-level changes.

The engine is well built, and of the best material. The piston is solid, and has sectional packing-rings, each section overlapping the other, and being set out by independent springs. This, of course, makes a very tight and true-wearing ring.

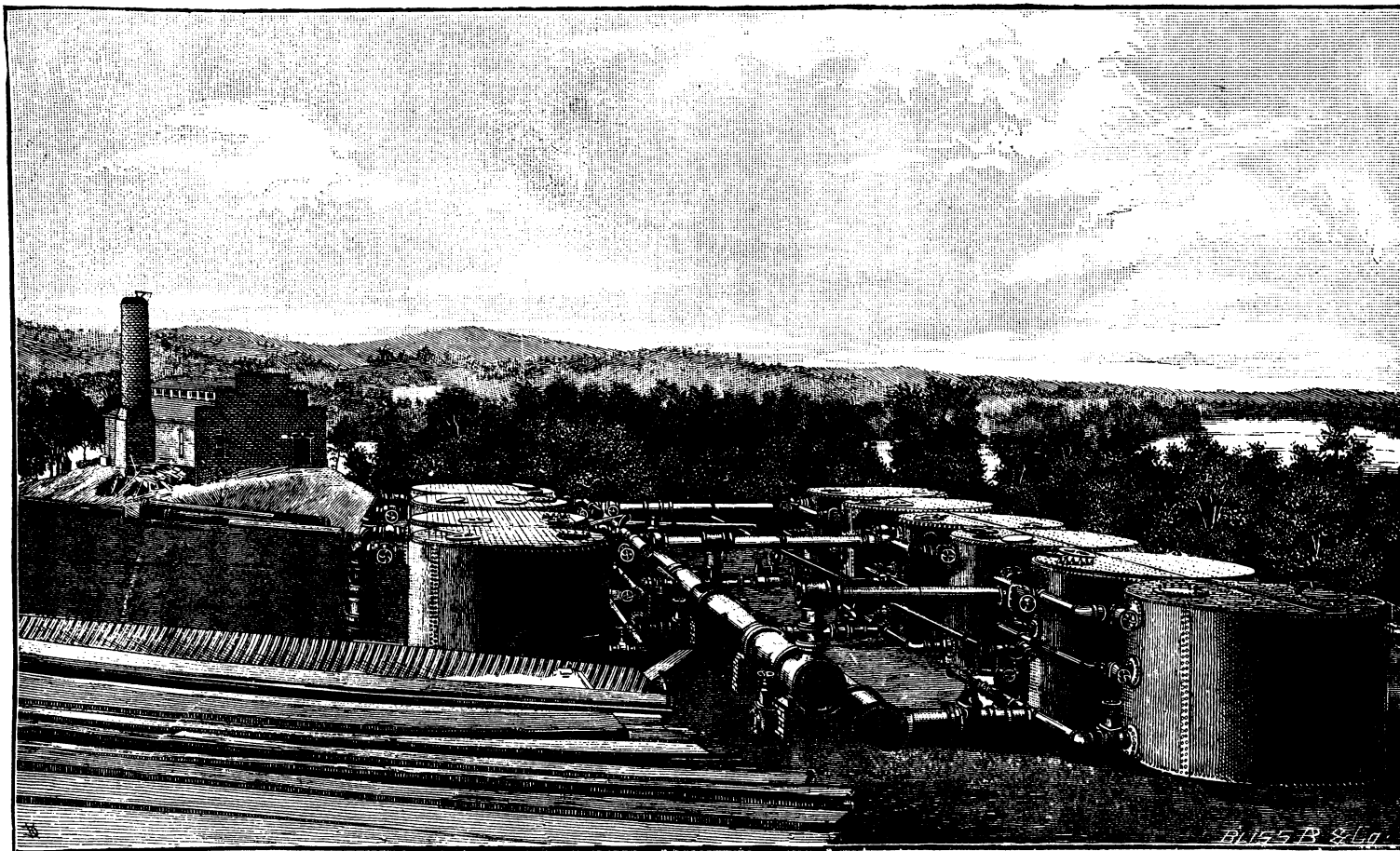
The valve is of the piston type, and perfectly balanced.

The governor is an automatic cut-off, working direct from the shaft to the valve; and the speed is very finely regulated, no matter

The engines and boilers are now built on one or separate bases, of one, two, four, six, and eight horse-power, and the company have in process of construction compound and triple expansion engines of various sizes. For further information, address the Shipman Engine Company, 92 Pearl Street, Boston, Mass.

WATER FILTRATION AND AERATION.

THE rapid growth of the mill industries, and of the arts and manufactures in general throughout the country, bring more than ever prominently to the front the important questions of the purity of the water-supply, and the necessity of taking immediate and active measures to secure this greatly to be desired quality. Particularly is this the case in the southern section of the country, toward



NATIONAL FILTER PLANT AT CHATTANOOGA, TENN.

what the load. The shaft is of cast steel, very large, and having extra long bearings in babbitted boxes.

All wearing parts are of extra size, and adjusted for the taking-up of lost motion. Lubrication of the cylinder is by a sight-feed; and the slides and shaft-boxes, by the ordinary oil-cup. Oiling of the crank-pin is effected by a centrifugal oiler attached to the crank-disk.

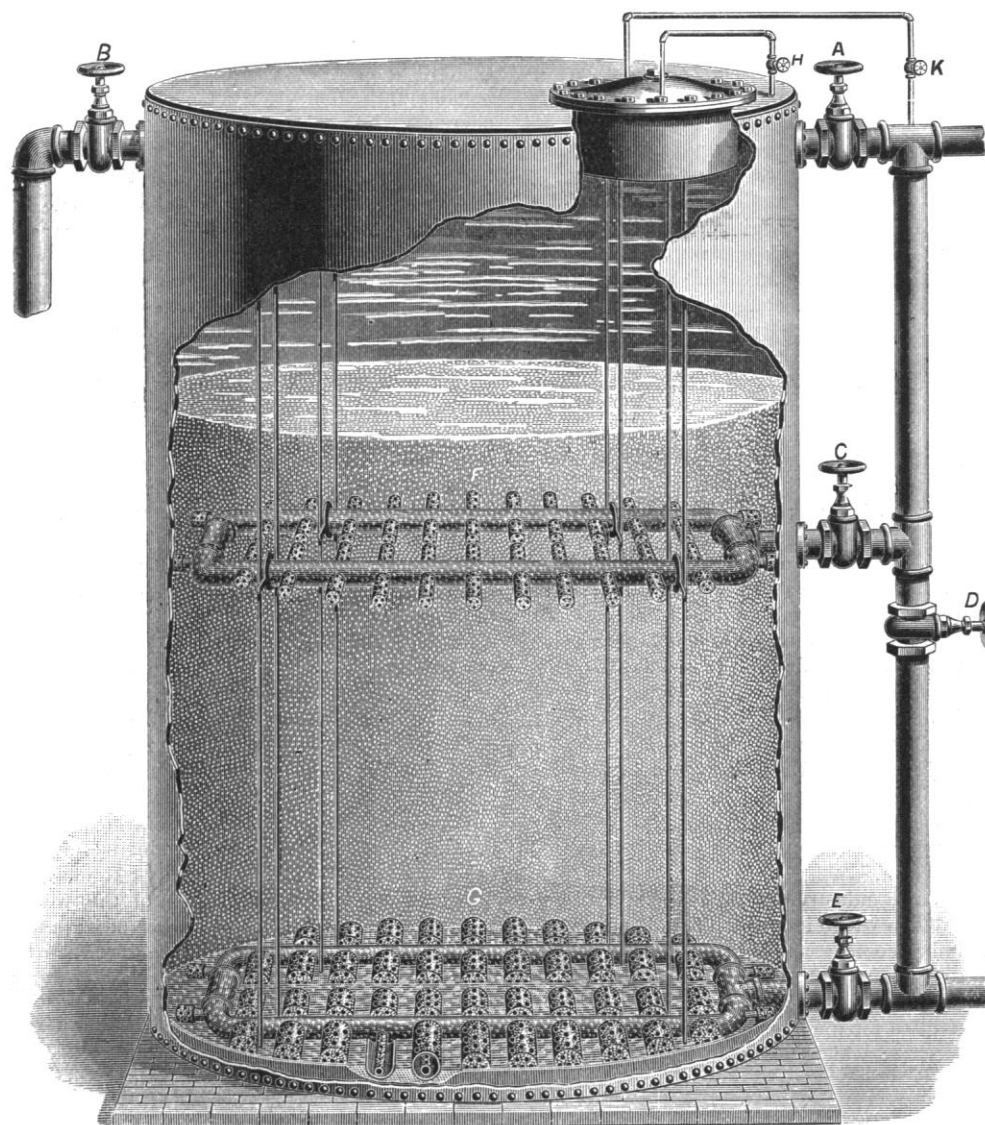
From the above it can be seen that when steam has been raised, and a sufficient quantity of oil and water supplied, the engine requires no further attention.

The question is asked, How are the fires operated when there is only cold water in the boiler? For this purpose a hand air-pump, attached to the boiler, is provided. A few strokes of this pump will start the fires, and it is only necessary to pump slowly for seven or eight minutes to raise enough steam to keep them going. As soon as steam is made, all work with the air-pump ceases, and, as before stated, one hundred pounds can be raised in from ten to twelve minutes. As regards the other advantages of "The Shipman," it can be said that it is compact, light, and durable, and entirely dispenses with the services of a skilled engineer.

which the attention of capitalists throughout the world is being more and more attracted. The more important features of health and cleanliness render it an imperative duty to prepare for the rapidly increasing population of our cities by taking judicious measures to secure to every community that system which, having simplicity and durability to recommend it, will, while being economical, insure a sufficient supply of pure water for individual use as well as for the factories and mills. Our country is blessed with a plentiful water-supply in almost every section, and the very fact of the abundance of this supply necessitates the precautions above referred to; as so large an amount of matter is carried in suspension in most of our large rivers, that some system of filtration must be resorted to. Some of the features that tend toward the perfecting of apparatus for this purpose are the ability to maintain the necessary "head or pressure," simplicity of construction, durability, quickness and thoroughness in cleansing, economy in water to accomplish this cleansing, cheapness, strength to withstand any desired pressure, and capacity to supply the maximum amount of clear water required for the purpose in view. The National Water

Purifying Company of New York have in their apparatus combined many, if not all, of these requirements; and an extensive plant installed by them at Chattanooga, Tenn., gives conclusive proof that scientific principles have entered into the construction of the plant, which seems to have well stood the crucial test of actual practice. The rapidity and thoroughness with which these filters can be cleaned, and the small expenditure of water required, are qualities in which this company excels, as they seem to have effectually solved the vexed question of surface washing. It has been found, from long experience, that most of the impurities taken from water, in the course of twenty-four hours lodge in the upper

in the boiler, necessitates a periodical stopping for its removal, ceases to be troublesome. It has been demonstrated beyond question that the thorough purification of drinking-water can be accomplished by combining aeration, precipitation, and filtration; and it is also reasonably claimed that the thorough aeration of water under pressure has the effect of destroying bacteria and plant-life that would be injurious to health. The aeration is accomplished by means of an air-compressor, whereby air is forced into the water under high pressure, thus producing a chemical action, which destroys the disease germs in the water, making it clear and sparkling. The process employed to attain this end by



SECTIONAL VIEW OF NATIONAL FILTER (250 GALLONS PER MINUTE).

six to ten inches of the sand-bed through which the water must pass before it leaves the filters, and that in their large machines, having a capacity of 250 gallons per minute of pure filtered water, this surface washing can be accomplished in four minutes, after which a reverse current up through the sand-bed breaks it up completely, and throws out all the finer particles of dirt. As the only labor required to accomplish this cleansing is the mere opening and closing of valves, the reverse current doing all the work, some idea of the extreme simplicity of the filter can be formed. By creating a feed of water free from those impurities which induce the formation of "scale" in boilers, a great economy of "fuel" is effected; the salts and other deleterious substances being deposited in the sand-bed of the filter, instead of passing into the boiler and shortening its period of usefulness by hastening corrosion; while the sediment that induces foaming, and which, gradually settling

the National Water Purifying Company is simple and inexpensive, and by it the amount of air forced into the water can be regulated to the exact requirements of the case. As a result, all odor in the mains, and vegetable growth, such as algæ, in the reservoirs, are prevented.

THE CULTIVATION AND UTILIZATION OF RAMIE IN THE UNITED STATES OF AMERICA.

IN his recent report on the Brussels Exhibition, Mr. Joseph Zervas draws attention to the importance of the cultivation of ramie. During the last thirty years, he says, numerous experiments have been made with a view to finding new plants yielding textile fibres. One of the most promising among these is the ramie, which is obtained from two plants, — *Bohmeria nivea*, yield-