

man, each one of the strikers would become for the nonce a political economist, and, tracing cause and effect, give experience due credit in influencing his future course, strikers would be fewer and the employe would be surer of the steady wages which the prosperity of the employing classes would enable them to pay. As it is, a moment's reflection and a little figuring will enable him to come to the conclusion that if he gains his point, the value of the time lost, not to speak of the resultant demoralization to himself and family, will more than offset the advantages to be secured.—*N. W. Lumberman.*

#### IMPROVED BOILER AND FURNACE.

We give herewith an engraving of an improved steam boiler, patented by Mr. William Ord, of Brooklyn, Ohio. The body or main portion of this boiler is of the usual construction. The particular one illustrated is tubular, 12 feet long and 48 inches in diameter. The improvement consists in a water front of cast or malleable iron, which is fitted to the lower surface of the boiler and forms a support for its forward end. This water front is cast with integral stays at suitable intervals, and the inventor has taken great pains to avoid flat unsupported surfaces by making the water front externally convex between the stays and by providing strengthening ribs.

Two three-inch tubes enter the water front on each side of the door and enter the boiler at the rear end, one tube of each pair entering the boiler near the bottom of the water space, the other entering near the top. To guard against any possible injury by the unequal expansion of the tubes they are provided with swinging joints.

The water front is connected with the boiler directly as well as by means of the side tubes. The result of this construction is the deposit of all sediment in the lower part of the water front, where it is removed from the action of the fire. This relieves the boiler from deposits of sediment and improves its steaming qualities, besides greatly increasing its capacity without proportionally increasing the consumption of fuel.

The door of the furnace is chambered, and receives water through tubular hinges, adding still further to the capacity of the boiler and at the same time increasing the durability of the door.

The furnace between the grate and rear end is provided with a series of perforated walls, which are designed to retain heat and aid in the combustion of the gases that escape unconsumed from the fire. To facilitate this operation the inventor provides a series of hot-air pipes, and forces hot air into the furnace and between the heat-retaining walls. This results in a very perfect combustion and in the suppression of a great proportion of the waste due to the escape of unconsumed gases.

In a side flue, shown in the engraving, there is a feed water heater composed of a series of tubes connected by manifold and communicating with the feed pump and boiler. These tubes have a great capacity, and the water in passing slowly through them deposits much of its sedimentary matter. The heater is arranged with valves so that it may be employed whenever necessary. In the improved boiler the cost of the combined water front and mud drum is less than that of the usual cast iron front and mud drum. The heating surface is largely increased by the application of this improvement, and as the tendency of the water to lift is greatly decreased, the steam is furnished dry. These and other advantages will be acknowledged by steam engineers and others familiar with the requirements of a practical and economical boiler.

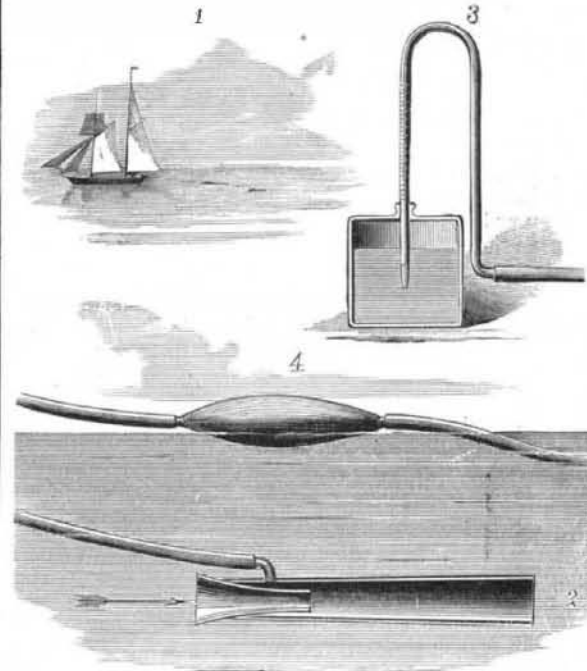
Further information may be obtained by addressing the Buckeye Bridge and Boiler Works, Cleveland, O., or the inventor as above.

#### Cheap Oxygen.

*Les Mondes* states that the Boussingault process of obtaining oxygen by the alternate peroxidizing and reoxidizing of barium has been greatly improved in the hands of MM. Brin. Four hundred separate charges were taken off, yet failed in any way to deteriorate the mass. These manufacturers anticipate being able to supply the gas at about twelve to fifteen centimes per cubic meter. As this is something like ten or fifteen cubic feet for a cent, the realization of such anticipations would prove of the highest importance in the arts.

#### NOVEL SHIP'S LOG.

The engraving shows a novel device for readily and accurately determining the speed of a vessel moving through the water, regardless of the time, position of the vessel, or condition of the water. This is effected by means of a device for creating a vacuum in a pipe extending to such a distance from the vessel as to be outside of the body of water affected

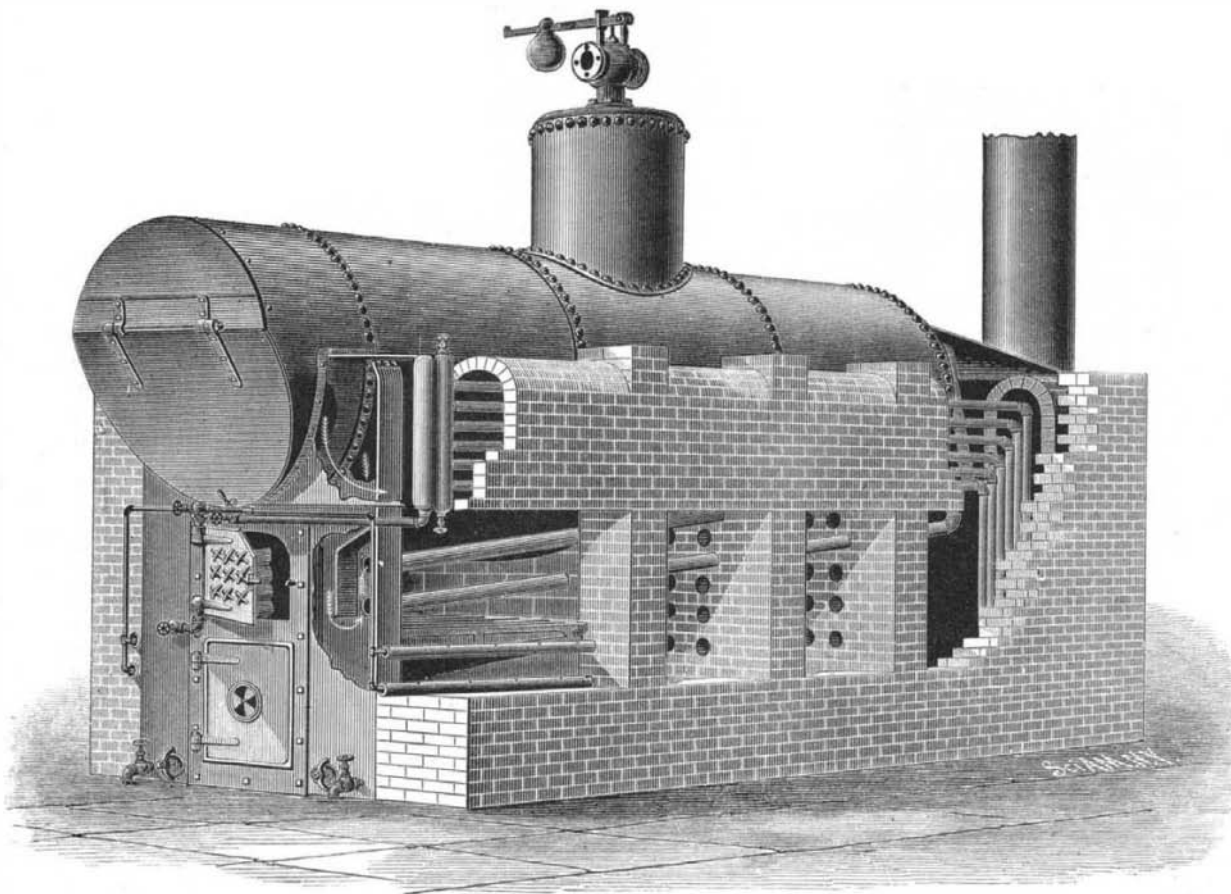


IMPROVED SHIP'S LOG.

by the vessel's movements, yet communicating with an indicating device upon the vessel, so graduated as to show the extent of the vacuum, and consequently the speed at which the vessel is moving through the water.

The instrument consists essentially of a flexible pipe, an indicator or gauge upon the ship, with which one end of the pipe is connected, and a vacuum device of any suitable construction, connected to the opposite end of the pipe, towed after the ship, and constructed to permit the water to so flow past the end of the pipe as to create a partial vacuum in the latter.

Fig. 4 shows a tube open at both ends, the forward end being flaring, the better to catch the water as the tube is drawn forward. This tube is provided at the front end with



#### ORD'S IMPROVED BOILER AND FURNACE.

a sleeve, forming a surrounding chamber, open at the rear end and communicating with a long flexible and non-extensible pipe, which at the opposite end communicates with a vacuum or other gauge, shown at Fig. 3, arranged in any desirable position upon the vessel. The flaring tube is so constructed and connected to the flexible pipe that the tube will be maintained in a substantially horizontal position, and floats are attached to it for this purpose.

As the tube is towed after the vessel and carried through the water the air or water is withdrawn from the flexible pipe to an extent proportioned to the speed of the vessel, thereby creating a partial vacuum in the pipe and in the gauge on the vessel, which indicates, by the position of the mercury or index finger of the gauge, the speed of the

vessel. This invention was recently patented by Mr. William S. Hogg, of Washington, D. C.

#### The St. Gothard Parasite in India.

Professor J. F. P. McConnell announces that he has discovered in Calcutta the parasite *Dochmius duodenalis*, which caused so much trouble among the workmen of the St. Gothard Tunnel. Professor McConnell states that the worm is by no means confined to the upper division of the small intestines; on the contrary, the majority of the specimens were removed from the mucous membrane of the jejunum. They were firmly fixed to the gut. As Professor McConnell found the parasites in a large number of post-mortems, in cases where the victims, who are natives, died of many different diseases, he does not feel justified in stating that they were the sole cause of death in any case. In many patients he admits that anemia was the prevailing feature, but attributes this rather to dysenteric and malarial complications.

#### Railway Progress in the Southwest.

The president of the Atlantic and Pacific Railway Company, Mr. H. C. Nutt, has lately returned from an inspection of the line in New Mexico and Arizona, and of the Atchison, Topeka, and Santa Fe Railroad. Mr. Nutt said (April 21) that the track laying had been completed to Cañon Diablo, 311 miles west of the Rio Grande. A viaduct is being built over the cañon 525 feet long and 254 feet high, to be completed by May 25, at a cost of \$250,000. The track will be pushed west to the Colorado River, 250 miles, at the rate of two miles a day. One hundred miles of that distance is graded, and steel rails for 200 miles are delivered. Plans are just completed for a bridge across the Colorado River, to cost \$250,000. He will also extend the Central Division 100 miles west from Vinita, Indian Territory.

#### NEW INVENTIONS.

An improved cyclometer has been patented by Mr. John J. Morton, of Albion, Mich. The object of this invention is to apply odometers to bicycles in an inexpensive and convenient manner, and so as to secure accuracy of operation without liability of derangement. Heretofore odometers have been applied to the axles of bicycles; but, the space being limited, it has been necessary to remove the lamp to make room. Further, the application has not been such as to secure accuracy nor render the instrument convenient for observation. This invention consists in an odometer suspended face upward by means of a weight or by the lamp, so that it can be freely observed by the rider.

Mr. Edmund T. Spottswood, of Perrysville, Ind., has patented a revolving sickle bar for mowing and reaping machines, the particular form, construction, and arrangement being such, relative to each other and to the fixed cutting edges, that the spiraled edges, as the sickle bar revolves, travel across the fixed cutting edges continuously or in such rapid succession as to cause all the grain to be cut as effectually as with the ordinary reciprocating section bar or sickle.

Mr. Jared R. Woodfill, of Aurora, Mo., has patented certain improvements upon that form of repeating instrument in which the instrument for each line has a magnet with independent helices about the same core, one of which helices in each instrument is charged by their respective main line circuits, and the other of which helices is charged by a local battery current, and in which each instrument is provided with two sets of contacts controlled by the armature lever of that instrument, one of which set of contacts in the first instrument controls the second main circuit in the other instrument, and the other of which set of contacts in the first instrument controls the local battery in the second instrument, and in which the two sets of contacts of the second instrument act reciprocally to the first in the same way to produce the same result.

CAPT. LAMB, of the bark *Elizabeth Ostle*, from Calcutta, March 23, saw, the day before, in latitude 39° 30', another immense field of dead fish. For a distance of forty miles the dead fish were seen floating about. They appeared to be quite fresh, and looked like shad. Another ship, from Rio Janeiro, passed through a great multitude of dead fish, the same day, about sixty miles from Barnegat.