



Marlands Improvement for Utilizing the Heat of Boiler Furnaces. Fig. 1.—A Vertical Cross Section of the Boiler Setting.

MARLAND'S IMPROVEMENTS FOR UTILIZING THE HEAT OF BOILER FURNACES.

The accompanying illustrations represent apparatus patented by M. O. Marland for the purpose of securing economy of fuel in boiler furnaces, and are of interest to all users of steam-power. From a report concerning this improvement, recently made by Mr. John C. Hoadley, of Boston, it appears that this furnace setting, as it may properly be termed, is capable of giving a very great increase in the economy of fuel. In Fig. 1 a cross section of the apparatus is shown, taken near the front end of the boiler setting. The boiler C is of the plain tubular form, fired underneath. Fig. 2 shows a cross section at the back end of the boiler, and Fig. 3 is a longitudinal section through the whole apparatus. The principle of the device is similar to that of the Siemens regenerative furnace. The hot air and gases passing to the chimney are carried through tubes, having very thin walls. The air to supply the fire is carried along upon the outside or between these tubes, and becomes highly heated by contact with them. The draft is controlled, or rather furnished, by a pair of Root's

blowers, and the outgoing hot air from the furnace is divided into three streams, and is drawn outward by another blower. In Fig. 1, H is an air pipe connecting with all the passages, A, and conducting air from them to the branch pipes I¹ and J¹, by which the air is distributed into the ashpit, over the bridge wall and to other portions of the furnace, as K and L in Fig. 3. D and N are the cases of the two Root's blowers, N being used to force the air into the furnace, and D to exhaust it and force it out of the pipe. In Fig. 2 a section of the blower is shown. Here the arrows indicate the course of the air. Entering the blower N, it passes into the tubes A A, and turning at right angles is conducted along the whole length of the boiler, separated from the hot-air currents by thin partitions, which divide the spaces A A from B B. It then passes down the tube H H and into the furnace, from which, after passing through the fire and the tubes, it is exhausted by the blower D and discharged into the air. When the exhaust blower is not running, the valve G is opened and the gases escape by the passage T. Two blowers are not necessary, D being in many cases ample for the purpose. According to the ideas of the inventor Fig. 3 the longitudinal section,