

DOMES ON STEAM BOILERS.

By W. H. WAKEMAN.

A few days ago I fired up a boiler that had not been used for about six months. After the air was forced out of it by the steam, through an open safety valve, the valve was closed and pressure allowed to accumulate. It was not tight, so I raised the lever and let steam blow freely through it. At first this steam was dry, but after about 30 seconds the discharge pipe was nearly half full of water that was coming out with the steam. As this boiler has no dome on it my attention was called by the incident to the difference between boilers that have domes and those that have none. In the above mentioned case the boiler was not flooded with water, as there was only two gauges, or no more than would be carried in practice.

The philosophy of the water coming out with the steam is as follows: When the safety valve was lifted enough to give the full capacity of pipe, there was a very great rush of steam through it, which lowered the pressure on the surface of the water immediately under the steam pipe. I do not mean to say that it was lowered very much, for it probably was not, but a difference of one pound is enough to cause trouble; for, as the pressure is maintained on the remainder of the water surface, it forces the water directly below the steam pipe out with the steam. Domes are put on boilers to obviate the evil, for they afford a very much larger opening for the escape of steam, consequently the velocity is less, and the water below the opening is not forced up with the steam. It is not assumed that the shell is cut away for the full size of the dome, as that would weaken the shell more than is necessary, but an opening that is twice the diameter of the steam pipe should be provided. Where there is a manhole

in the dome, the shell is cut away enough to make an opening as large as the manhole. Those people who object to domes point out the fact that an opening of this size greatly reduces the strength of the boiler, but there is no good reason for this remaining so.

A boiler without a dome is usually fitted with a manhole in the shell, and this is reinforced with a frame that is supposed to be as strong as the metal in the shell was before it was removed. Suppose it was decided to put a dome on his boiler, and to locate it over the top manhole. Could any boiler maker consider it necessary to remove the frame as useless? I think not, for he would say that it supported the shell and made the whole structure stronger than it otherwise would be. This being true, why is it not good policy to put on a supporting frame inside of the dome when a boiler is built? If this was done the claim that a dome weakens the shell of a boiler would no longer be tenable; and this is the principal objection to having one included in the specifications. The claim that it acts as a reservoir for steam, to be used when wanted, as presented by those who favor it, is not worthy of serious consideration on account of its small capacity; neither is the objection offered to it by the opposition, who say that it acts as a condenser, as the surface exposed is not large, and it should be protected by some good covering. The conclusion of the whole matter is, therefore, that a dome furnishes dry steam to the engine as above described, and it does not weaken the shell when properly constructed, any more than it does to put a manhole in the shell at some other point. —The Wood-Worker.

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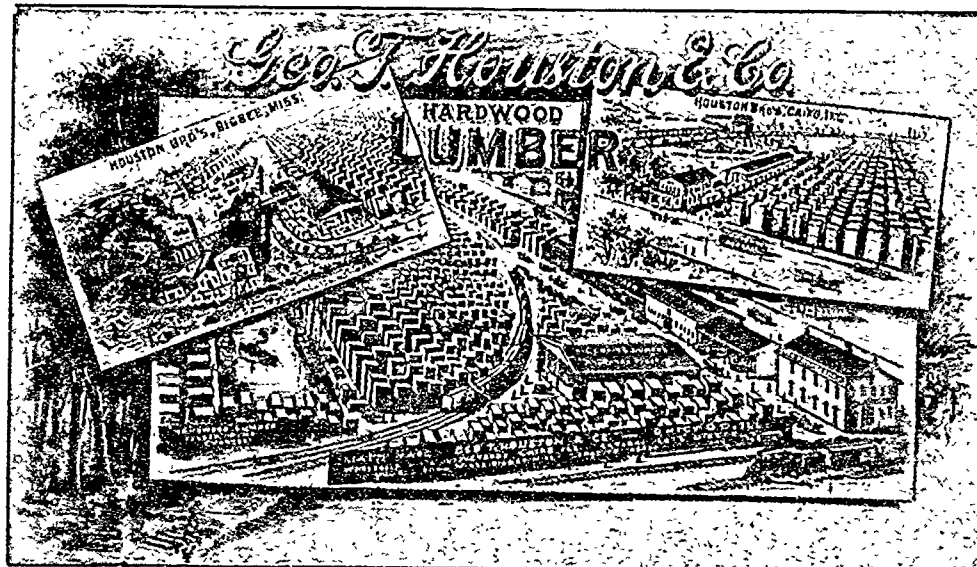
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