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THE MANUFACTURE OF NON-CONDUCTING COVERINGS FOR STEAM PIPES, BOILERS, ETC.

All questions which touch the relation of the actual amount of power in a pound of coal to that which is practically obtained therefrom, are just now receiving closer attention than ever before. The fact that, in the average working of the better classes of steam engines in general use, we only obtain about ten per cent of the value of the heat that is expended in the furnace, has long been known, but the various styles of compound engines, the Loftus Perkins system, and all the thousands of inventions and improvements in furnaces, engines, and boilers, for more completely obtaining the full power of the coal consumed, have fallen so far short of success as to leave the question of its perfect utilization almost untouched. The principal difficulties in the way of making and using steam at about the temperature of the furnace fire, which would obtain the theoretical value, excepting losses in combustion, are of a mechanical nature, as it has thus far been found practically impossible to work under the high pressures this would give. But the way in which the temperature and the pressure of steam, in our ordinary boilers and engines, are allowed to drop in the steam chest, cylinders, and pipes after it leaves the boilers, as well as the loss in the boiler itself from the diminution of heat by radiation, indicates a want of economy in one of the simplest matters of

detail, where comparatively inexpensive provisions would many times repay their cost.

In the illustrations below we show the processes followed in making the Chalmers-Spence non-conducting and "air space" coverings for boilers, steam chests, cylinders, pipes, etc., through the proper application of which the loss of heat by radiation may be almost entirely prevented. The name of the company is taken from the patentees, Messrs. Chalmers and Spence, who were first to make a practical success of this method, and it has now been in use sufficiently long to have thoroughly demonstrated its efficiency, the list of testimonials which the company shows embracing not only the engineering department of the United States Navy, but hundreds of the largest steamship companies and manufacturing establishments in the country. These coverings have also been applied with great success on the hot air pipes of blast furnaces, and wherever hot air is to be conveyed to a distance, their use in this way offering relatively the same advantages as are obtained when steam pipes are thus covered.

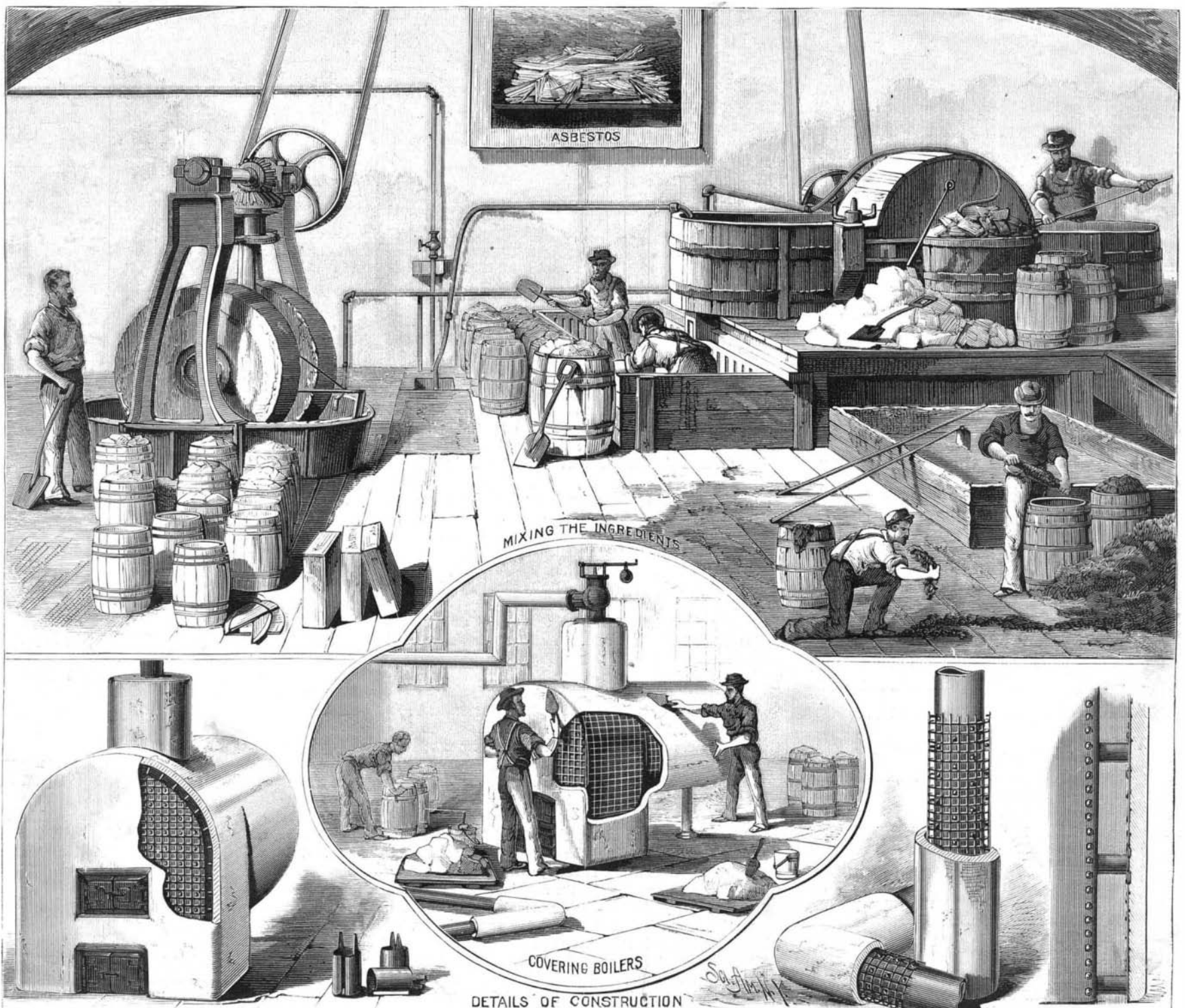
In most of these coverings asbestos is used in larger or smaller proportions. Its strong yet delicate fibers, with the fact that it is entirely unaffected by fire, peculiarly fit it for this purpose. It is a variety of hornblende and pyroxene, generally of a clear or grayish-white, and is mined to some extent in almost every part of the world, our supplies coming principally from the Mediterranean, China, and Canada.

The view at the left shows a mill for crushing the asbestos, care being taken that in this operation there shall be no friction or attrition from the rollers to grind the material or break its fibers.

As generally applied in the coverings of boilers, cylinders, tubes, etc., the asbestos is made into a kind of plaster with a mixture of hair and other materials, and this portion of the work is shown so that it will be easily understood by a reference to the engraving. The tearing up of the hair, the tank, barrels, and piles of material ready to place in the revolving drum, and the barrels in which the prepared mixture is received as it comes out, give a graphic idea of the process.

The view at the bottom of the page illustrates various ways of putting on the covering. In the center the workmen are seen applying it with trowels around a boiler, very much as a mason would plaster a room. At the left is a boiler thus covered, with a section torn off to show a portion not covered, and to the right stands a pipe on which the "air space" covering has been applied at the bottom, while above and around the pipe is shown the wire cloth frame on which the covering is plastered. This frame is kept at the proper distance from the pipe by studs of a greater or less length, according to the amount of air space it is intended to leave around the pipe, and the covering is plastered on this frame,

[Continued on page 244.]



MANUFACTURE OF NON-CONDUCTING COVERINGS FOR STEAM-PIPES AND BOILERS.—THE CHALMERS-SPENCE CO., NEW YORK CITY.