

## UNITED STATES PATENT OFFICE.

HENRY ARMSTRONG, OF DARLINGTON, COUNTY OF DURHAM, AND JOSEPH A. LOUDON, OF EXETER, COUNTY OF DEVON, ENGLAND.

## BOILER-COVERING.

SPECIFICATION forming part of Letters Patent No. 287,994, dated November 6, 1883.

Application filed August 23, 1881. (No specimens.) Patented in England July 22, 1881, No. 3,297, and in France August 2, 1881, No. 144,214.

*To all whom it may concern:*

Be it known that we, HENRY ARMSTRONG, of Darlington, in the county of Durham, and JOSEPH AUGUSTUS LOUDON, of Exeter, in the county of Devon, England, have invented a certain new and useful Improvement in Boiler-Coverings; and we do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The object of our invention is to treat and utilize peat, which consists of vegetable matter more or less decayed in damp or marshy situations, so that the fiber of which it largely consists may be used in the manufacture of paper, for spinning into threads or ropes, which threads may afterward be woven into cloth, and for other purposes, as hereinafter described.

To carry our invention into effect we prefer to use peat removed from the upper part of the beds in which it is found, such upper parts being ordinarily lighter in color, more fibrous, and more approximate in composition to ligneous tissue than that found in the lower part of the beds, which is ordinarily darker in color, less fibrous, and approximating in composition to lignite and some kinds of coal. We wash the fibrous peat in order to remove earthy and other impurities, and we then treat it with a hot solution of a caustic alkali, preferably soda, in order to dissolve and get rid of resinous and gummy matters and render the fiber soft and pliable, and we then wash the fibers until the alkali is removed. In order to make brown paper from the peat fiber so prepared, we add it in the proportion of from twenty to fifty per cent. to form eighty to fifty per cent. of the fiber of old hemp rope, bagging, or other hempen material, omitting the china-clay or other analogous mineral substance, which is ordinarily added to brown papers made in the usual. The materials in these proportions produce paper which, though of not too great weight, has sufficient substance, "handles" well, and is of valuable quality, while the tannic acid, which is one of the con-

stituents of the peat fiber, gives a good color to the brown paper made with it, and in cases where salt-water has to be used in the manufacture such tannic acid neutralizes the salt to a greater or less extent and prevents or lessens its injurious effect upon the boilers and other implements used. Animal or vegetable size—such as gelatine or starch—may be added to the materials in order to increase the strength of the fiber, and the cheapness of the peat fiber used enables such size to be added with advantage in larger proportions than is usually the case. The peat fiber and other material, as described, are placed in a paper-making engine of any of the ordinary well-known kinds, where they are disintegrated and mixed before being made into paper in the usual way, and purple, blue, or other coloring-matter may be added, if desired.

Brown paper made from peat fiber in the way described is better in quality and appearance, stronger, and cheaper than such paper made of the ordinary materials.

Where paper more or less white, instead of brown, is to be made, we substitute peat fiber prepared as already described, and bleached by chloride of lime or other well-known means, for the wood pulp, straw, or other fibrous substances ordinarily used in the manufacture of such paper, and peat fiber so used is cheaper and the paper made from it is better in quality and appearance and stronger than when such wood pulp, straw, or other fibrous substances are used.

The proportion of peat fiber may be varied to suit the quality and character of the paper which is to be made, which may in some cases consist entirely of the peat fiber, and by omitting size and using a very large proportion of peat fiber prepared as described, an absorbent paper is produced suitable for blotting or filtering paper and other purposes where unsized absorbent paper is ordinarily used, or for making joints between steam-pipes, and other analogous purposes; or the fibrous mixture, instead of being used to make papers, may be used—a large proportion of size being



added—as a substitute for ordinary papier-maché in the manufacture of solid moldings or other articles.

The fibers prepared as described may be felted together, so as to produce a cheap felt cloth, which may be used for the various purposes to which ordinary felt cloth is commonly applied.

Peat fibers prepared in the way already described may be made into thread by spinning them in spinning machinery of any of the ordinary well-known kinds, either with or without the addition and mixture of a proportion of hemp, flax, or other fibrous material, and the threads so obtained may be made into string, cord, or rope, or may be woven into cloth, which, for sail-cloth or other purposes where it is to be exposed to the weather, is valuable on account of its great durability; or the peat fiber disintegrated and mixed with cement—such as Portland cement—may be used in a plastic state as a non-conductor of heat, to cover boilers and steam-pipes, and in other places where heat is to be retained.

The fibers of peat, which have hitherto been a waste material, or have only been used for the manufacture of fuel, prepared and treated according to our invention, may be utilized with advantage and economy for numerous purposes, all of which it would be impossible to enumerate.

We are aware that it has been proposed to utilize fiber obtained from peat in the manufacture of paper by cold washing and trituration, and also by submitting the fiber to the action of hydrochloric acid and to alum without artificial heat; but such processes we do not claim; and we are not aware of any case in which cement has been mixed with disintegrated peat, and thus adapted for covering boilers, steam-pipes, and similar articles which are subjected to great heat.

We are also aware that it has been proposed to mix together crude or native peat and cem-

ent for the purpose of covering boilers; but such a composition has the disadvantage of retaining in it all the non-fibrous and earthy or mineral matter of the crude peat, and which tends to weaken it and to granulate or pulverize under the continued action of heat, and requires other and special ingredients in the compound to hold the covering together. In our invention, on the contrary, we first disintegrate and eliminate the fiber from the mineral portion of the crude peat, and then mix [this fibrous part only with the cement, and need no other adhesive or foreign material whatever.

We are aware that crude peat or silt has been mixed into a composition with oxide of iron, lime, sand, cow-hair, gypsum, mineral oil, and cement, and then used in a plastic state or molded into cakes or bricks. This differs essentially from our invention, and would form a covering for a boiler not only different in character, but requiring an entirely different mode of applying it to the boiler. No crude peat is employed in our composition, and no variety of elements to make it.

We claim—

The described composition, adapted to be applied as a covering for boilers, steam-pipes, &c., consisting of the fibers of peat separated or disintegrated from the bulk of its earthy matter and mixed with cement, all as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HENRY ARMSTRONG.

JOSEPH AUGUSTUS LOUDON.

Witnesses to the signature of Henry Armstrong:

WM. COWALL,

J. F. LONG.

Witnesses to the signature of Joseph Augustus Loudon:

JAMES BROWNE,

THOMAS W. ELLIS.