United States Patent Office.

AUSTIN BURT, OF DETROIT, MICHIGAN.

Letters Patent No. 92,699, *dated July* 20, 1869.

IMPROVED COMPOSITION-CORE OR FORM FOR MAKING CASTINGS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, AUSTIN BURT, of Detroit, in the county of Wayne, and State of Michigan, have invented and discovered a compound of matter from which to make cores or forms around or in which molten iron may be poured to form castings of any desired shape; and I do hereby declare that the following is a true and accurate description thereof.

The nature of this invention relates to the construction of cores and forms to be employed in making castings from molten iron; and consists in the use of such materials in the construction of such cores or forms as will effectually prevent the molten iron from chilling, by imparting to the same a sufficient amount of oxygen and carbon for the purpose, and, by the non-conducting properties of the materials employed, retard and delay the too rapid cooling of the iron.

I employ any of the known forms of lime, in suitable proportions, with proper quantities of sour beer, molasses, or any of the known materials employed to render the various ingredients of cores, as usually made, cohesive, and with or without coal or sand, if desired.

It is desirable that the lime so employed should be ground or otherwise reduced to the fineness of moulding-sand, although it may be used in a solid form, if more convenient.

For my own use, I am in the habit of making cores as follows, viz:

I take carbonate of lime and reduce it to the fineness of sand, and mixing with it about one-twelfth part in bulk of pulverized charcoal, I wet the whole up with clay-wash, in which a suitable proportion of wheat flour has been stirred.

I cannot give the exact proportions of charcoal, clay-wash, or wheat flour in every instance, as it varies with the carbonate of lime, which differs in different quarries, and also with the qualities of iron used, some of which will permit the use of very little charcoal.

The clay-wash and wheat flour are used to give adhesiveness to the component parts of the core, as also the sour beer and molasses named above.

Having thus mixed the ingredients of the core, I mould it into the form required, and bake it in an oven, being careful not to use so great a degree of heat as to expel the carbonic acid. The cores are then ready for use.

I also use the sulphate of lime and calcium in the same manner, but prefer the carbonate of lime, as it is more abundant, more easily procured, and cheaper.

Lime is the important ingredient in these cores, as it is a non-conductor of heat, and it renders the iron softer by delaying its cooling.

The action of molten iron upon the carbonate of lime in the cores, expels the carbonic acid, a portion of the carbon uniting with the iron, rendering it softer than before, while the calcium which is now produced about that part of the core which touches the iron, prevents the radiation of heat from it.

The iron is thereby kept from cooling rapidly, and when cool is in a softer condition than when cast with sand-cores.

Castings are made in this way from my cores, which may be cut or bored readily, which if made on ordinary sand-cores would be so hard that they could neither be cut nor bored.

The use of these cores, by myself and my neighbors for many months, has demonstrated their value, and has made effective many years of experiments, upon my part, which experiments were based upon the belief that lime would be the most important component part in cores.

I am aware that attempts have been made to accomplish this result, which attempts have hitherto proved unsuccessful, for the reason that the operators did not pursue their experiments far enough.

In "The Brass and Iron Founder," by James Larkin, he insists that "moulding-sand which contains lime, magnesia, and other oxides of metal, is not applicable, particularly for the casting of iron or brass;" and gives reasons therefor.

This opinion, I know, from practical experience, is wrong, as I have been employing the cores, made as above described, in my foundry, for some months, with entire success; therefore,

What I claim as my invention, and desire to secure by Letters Patent, is—

The employment of lime, in any of its known forms, as one of the ingredients from which to make cores or forms, for the purposes herein described.

AUSTIN BURT.

Witnesses:
J. G. DICKINSON,
H. E. BURT.