

# UNITED STATES PATENT OFFICE.

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## MAKING ARTIFICIAL STONE FROM MAGNESITE.

No. 803,479

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, MIKLÓS GERSTER, a sub-  
ject of the Emperor of Austria-Hungary, re-  
siding at Budapest, Austria-Hungary, have  
invented certain new and useful Improvements  
in Making Artificial Stone from Magnesite, of  
which the following is a specification.

Artificial stone or bricks of magnesite have  
formerly been made by subjecting the mag-  
nesite to long-continued burning at a very  
high temperature, after which it is coarsely  
granulated, pressed into suitable form, and  
then again burned. Various forms are made  
for various purposes, and I use the term  
"brick" in its generic sense to cover all the  
forms which may be made. In order that the  
bricks made in this way should not become  
deformed during the hardening consequent  
upon the second burning, the first burning  
of the non-granulated or raw magnesite has  
generally been continued until the magnesite  
has lost from thirty to fifty per cent. of its  
original volume. The magnesite thus con-  
siderably reduced in volume (and consequently  
very slightly or not at all reduced in the sec-  
ond burning) has been so far granulated that  
the particles or granules have a cross-section  
of about one millimeter. This granulated  
product has been then pressed into brick form  
and burned a second time. The process be-  
comes very costly and tedious on account of  
the first burning of the raw material to effect  
a shrinkage of thirty to fifty per cent., be-  
cause, on the one hand, the long-continued  
burning is a matter of much expense, and, on  
the other hand, the so fully burned magnesite  
is extremely hard and very difficult to granu-  
late. The accompanying invention aims to  
avoid these disadvantages, and it may be gen-  
erally stated that according to this invention  
the shrinking or reduction of the magnesite  
to the desired extent in the preparatory stages  
of the process is divided into two very dis-  
tinct phases. The first phase is of a chemical  
nature and continues until the carbonic-acid  
gas in the magnesite has been driven off, while  
the second phase begins from this point and  
is of a physical nature. In the first stage  
only is the hardening or shrinking necessarily  
accomplished by heat. In the second stage  
the shrinking is accomplished without the em-  
ployment of any heat, but entirely by me-  
chanical means. For example, the complete

process may be carried out as follows: The  
magnesite in its first burning is not brought  
down to thirty to fifty per cent., as formerly,  
but preferably is only so far burned as to drive  
out the carbonic acid. During this burning,  
the period of which obviously need not be  
calculated with absolute exactness, the mag-  
nesite loses at most twenty per cent. of its  
volume, but usually only ten per cent. The  
further diminution in volume by mechan-  
ical methods is preferably obtained by granu-  
lating the entire mass of burned magnesite  
to such a degree of fineness that its porosity  
is substantially diminished. The diminution  
of the porosity is preferably such that the vol-  
ume of pores or cells in the green-pressed brick  
(pressed with substantially the same or higher  
pressure as in the previous processes) bears  
the same relation to the total mass as in green  
bricks made according to the old process.  
Thus the fine granulation will have partly  
taken the place in effecting a shrinking of the  
material of the long-continued burning of the  
old process. Investigations have shown that  
the magnesite burned until the carbonic acid  
is driven off may advantageously be granu-  
lated in order to obtain the desired effect to  
such a fineness as to pass through a sieve of  
about one-third to two-thirds of a millimeter  
cross-section. Thus the operator has a de-  
termined and observable range of fineness of  
granulation which corresponds to the quality  
of the burned material.

An important advantage of the invention  
is that the magnesite burned free of carbonic  
acid, as described above, is so much softer  
than the magnesite burned to a reduction of  
thirty to fifty per cent. under the old process  
that the especially fine granulation above  
mentioned may be accomplished much more  
easily and with less cost than the coarse gran-  
ulation carried on under the previous proc-  
esses. The complete hardening of the brick  
may then be secured by a second burning in  
the ordinary way.

The surface of the bricks made in this way  
is very smooth and the bricks have sharp  
corners, so that in use they require very little  
binding material.

The shrinkage in volume above referred to  
must be distinguished from the shrinkage in  
mass or weight. The loss of weight of the  
raw magnesite will be obviously the same



whether it be burned until it is completely hardened or only until all the carbonic acid is driven off, since the maximum loss of weight is identical with the quantity of carbonic acid  
5 originally contained in the magnesite. On the other hand, the loss of volume depends on the physical structure, the amorphous structure of the magnesite which exists at first after the driving off of the carbonic acid being gradually changed by long heating at a  
10 high temperature to a crystalline structure, and this change is accompanied by a reduction in volume. It is this reduction in volume which, according to the present invention, is brought about not by the action of  
15 heat but by mechanical means.

Though I have described with great particularity of detail a specific process embodying my invention, yet it is not to be understood therefrom that the invention is limited  
20 to the exact process described. Various modifications may be made by those skilled in the art without departure from the invention.

What I claim is—

25 1. The process of making bricks from magnesite which consists in burning the raw material only to such a point as to accomplish a part of the reduction in volume necessary before the second burning, granulating the

burned magnesite so finely as to accomplish a  
30 substantial part of such reduction in volume, whereby the cost of burning is lessened and the granulation is facilitated, pressing the granulated material into bricks and burning such bricks. 35

2. In the manufacture of bricks from magnesite, the method of preparing the magnesite which consists in burning it to produce a reduction of less than thirty per cent. in volume, and granulating this burned product to such  
40 a fineness as to avoid substantial deformation in the final burning.

3. In the manufacture of bricks from magnesite, the process of preparing the magnesite which consists in burning the magnesite only  
45 to the point at which the carbonic acid is driven off therefrom, and then granulating the burned material to such a point as will avoid substantial deformation in the final burning. 50

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

MIKLÓS GERSTER.

Witnesses:

FRANK E. MALLETT,  
CHARLES E. BALTZO.