

UNITED STATES PATENT OFFICE.

WALTER K. MARVIN, OF NEW YORK, N. Y.

IMPROVED COMPOSITION FOR FILLING FIRE-PROOF SAFES.

Specification forming part of Letters Patent No. 40,800, dated December 1, 1863.

To all whom it may concern:

Be it known that I, WALTER K. MARVIN, of the city, county, and State of New York, have invented certain new and useful improvements in fire-proof safes, chests, bank-vaults, and other doors and fire-proof structures; and I do hereby declare that the following is a clear and exact description of the same.

My improvement relates to the production of heat-resisting compounds employed for filling the spaces between the inner and outer shells of fire-proof safes; also, for filling the space within the inner and outer walls of fire-proof doors. The desiderata of fire-proof safes, of otherwise ordinary or suitable construction, are that the filling used between their outer and inner shells and within the inner and outer walls of the door, while a good non-conductor of heat, shall not be liable to corrode and destroy the inner walls and other parts of the safe with which it comes in contact, nor communicate dampness to the interior of the safe, and thereby impair the binding of books, and damage paper and other valuables which safes are designed to contain and to protect. Compounds heretofore in use fail in either of these particulars. Thus the filling most extensively used and consisting of pulverized calcined gypsum introduced into the cavities of the safe, mixed with water, and allowed to set into a solid consistence was liable to corrode the iron with which it came in contact and to impart dampness to the wood-work constituting the inner chest, thereby molding books, and impairing parchment and other property usually put in safes. Another objection to this filling consisted in the loss of its water by long exposure to the warm atmosphere of rooms in which safes are frequently kept, so that it became incapable, when exposed to fire, of producing sufficient vapor to preserve the contents of the safe. Clay and alum have also been employed for the purpose of lining safes; but this compound could not be made permanently to fill the spaces of the safe, because, when subjected to even a moderate heat as compared with that which safes should be capable of sustaining, the filling would settle into the lower parts of the cavities, leaving the upper portion empty. To remedy this it was devised to intersperse the clay and alum compound with pieces of brick or other porous material, forming cells, which were to prevent the

filling from settling down; but this arrangement does not wholly accomplish the object for which it was intended, while it was comparatively expensive, as it required much time and skill to properly adjust the bricks.

To remedy these defects in fire-proof safes is the object of my invention; and my invention consists in forming a new compound for filling safes, chests, and other fire-proof structures by combining calcined and powdered gypsum with alum when the latter is embedded into the former in such relative proportions as that the water of crystallization of the alum which may be evolved by heat shall supply the quantity requisite to "set" the plaster.

To enable others skilled in the art to make and use my invention, I shall now proceed to describe the manner in which the same may be carried into effect.

I take calcined gypsum or plaster-of-paris and alum in the proportions of about six parts of the former to four parts of the latter, and intimately mix and incorporate the same. The alum I prefer to break into pieces varying in weight from one grain to half an ounce. I introduce this mixture or compound into the safe between the inner and outer shells, also fill the space within the door formed by the outer and inner plates thereof. The compound should be carefully packed, so as to produce a homogeneous mass throughout, and as densely as practicable. Before filling the safe, as described, care should be taken to pack hermetically the joints and to coat the surface of the iron exposed to contact with the compound with a composition such as will protect the iron from corrosion. I have found that soluble glass or liquid quartz applied with a brush and then heated forms a film or glaze over the whole surface which will effectually accomplish the purpose.

The advantages which my process or compound of filling possesses over those heretofore in use are manifold. The principal, however, are, first, absence from moisture or dampness while the safe is in use, the plaster being in a dry or calcined state within the walls of the safe; second, there is no tendency of the compound to settle when exposed to heat, because the water to be supplied is held by the alum in suspension throughout the whole mass of plaster, ready to be yielded whenever necessary to mix with the plaster and to set it, and, as it

were, to petrify it in position. There is therefore no settling of the compound. In other respects the new compound combines the qualities of the alum filling and the plaster-of-paris filling heretofore used.

It will be understood that the alum, when heated to a temperature of about 212° , emits its water of crystallization, which, readily combining with the surrounding plaster, produces a species of crystallization, whereby the plaster acquires solid consistence and becomes set. The plaster is then converted into a spongy mass containing cells which indicate the places where the alum was embedded in the mass of plaster. After the plaster is set, as described, the filling composition behaves like the old plaster filling—*i. e.*, when exposed to a still higher temperature, say 400° Fahrenheit, the combined water escapes and fills the cavities within the shells of the safes with vapor or steam, which resists their destruction by fire.

I am aware that sulphate of iron mixed with plaster-of-paris or other materials—such as slaked lime, drier, clay, &c.—have been used or suggested as a filling for safes. Such composition I distinctly disclaim.

Having now fully described my improvement and the manner in which the same is or may be carried into effect, I would observe that I do not wish to confine myself to the precise proportions of ingredients hereinbefore described; but

I do claim as my invention—

The herein-described compound for filling safes and other fire-proof structures, the same consisting in the combination, with calcined and powdered gypsum, of alum in pieces embedded in and interspersed through the mass of plaster in such relative proportions as that the water of crystallization of the alum which may be evolved by heat shall supply the quantity requisite of water to set the plaster, substantially as and for the purposes set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

WALTER K. MARVIN.

Witnesses:

A. POLLOK,
JOHN S. HOLLINGSHEAD.