

No. 674,774.

Patented May 21, 1901.

G. KELLY.
MINERAL WOOL BRICK.

(Application filed Aug. 31, 1900.)

(No Model.)

Fig. 1.

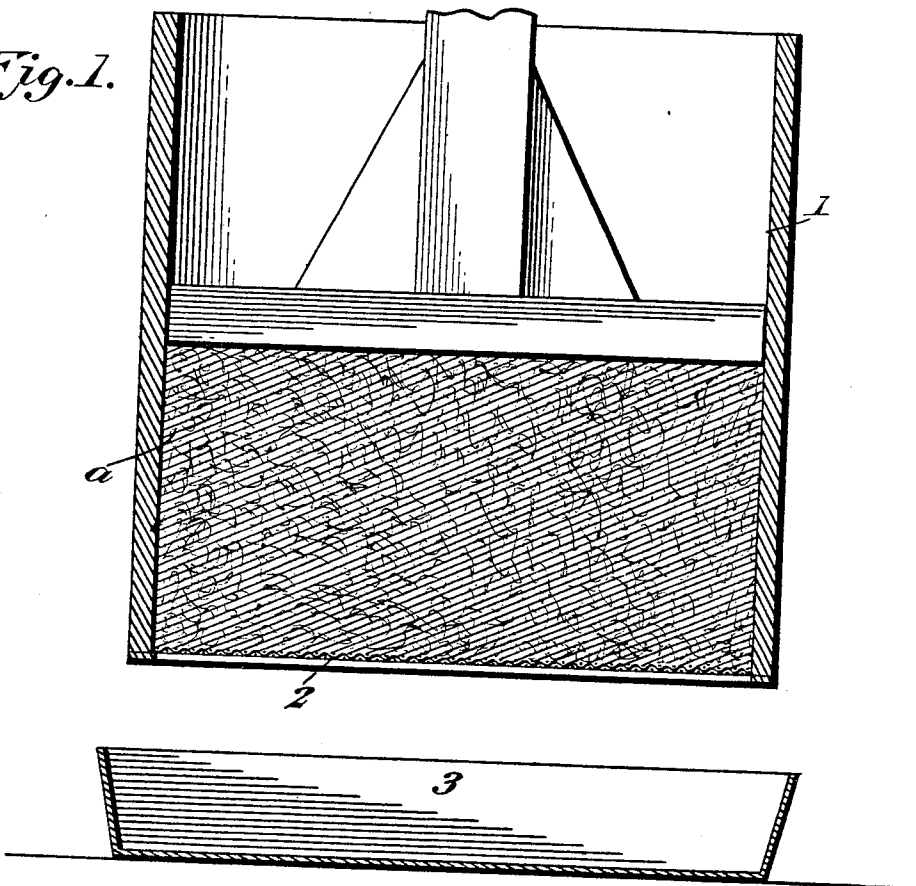
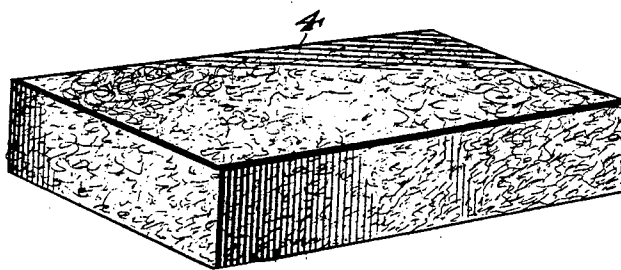


Fig. 2.



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UNITED STATES PATENT OFFICE.

GEORGE KELLY, OF MINERALPOINT, WISCONSIN.

MINERAL-WOOL BRICK. & Sodium Silica

SPECIFICATION forming part of Letters Patent No. 674,774, dated May 21, 1901.

Application filed August 31, 1900. Serial No. 28,700. (No model.)

To all whom it may concern:

Be it known that I, GEORGE KELLY, a citizen of the United States, residing at Mineralpoint, in the county of Iowa and State of Wisconsin, have invented a new and useful Mineral-Wool Brick, of which the following is a specification.

My present invention relates to a novel fibrous article and to its method of production. In the employment of insulations of various character constructed from the mineral fibers great difficulty has been experienced in the securing of self-sustaining bodies capable of manufacture at slight cost and of maintaining their original forms without the employment of binders or binding fibers having greater strength than the fibrous structure of the insulation. Chief among these materials which have been employed in this connection is asbestos and asbestos and fillers; but by reason of certain inherent properties its formation in a self-sustaining structure is made possible only by the practice of a more or less expensive mode of treatment or process. Asbestos perhaps may be woven into a self-sustaining structure—such, for instance, as curtains for theaters, fireman's gloves, and the like; but this is a very expensive structure. The self-sustaining structure required might perhaps be molded if a suitable sizing be forced through the asbestos body and especially where fillers of any kind are used with the asbestos; but this is impossible for the reason that while asbestos is a fibrous material it is practically solid, and it is impossible to force a liquid through the asbestos body by pressure. It has been found that if the fluid is allowed to evaporate from an asbestos pulp, which is, in fact, the only method of effecting its dehydration, the resultant mass will have a stiff clay-like structure and will be of considerably greater weight than the pure asbestos or fillers and asbestos. In fine, any known treatment of asbestos which is productive of a self-sustaining body—that is to say, a body which will retain its original shape—is attended by great expense and by such stiffening or solidifying of the body as will greatly increase its weight. I have entered into this lengthy discussion of commercial asbestos and its production for the reason that my present invention or discovery

has relation to the production of a non-conductive or insulating body of mineral wool, which is ordinarily, although erroneously, considered as being structurally similar to asbestos. The great lightness of mineral wool, which, as distinguished from asbestos, is a manufactured fiber, has long recommended its use as an insulating packing or covering. It has been considered impossible, however, to make mineral wool take the place of asbestos. Mineral wool cannot be woven, and it is not a self-sustaining structure without enclosing it in a casing of some form or incorporating in the fibrous structure a series of strengthening or binding fibers, both of which expedients are expensive and only partially efficient. The fact that the wool is not capable of sustaining its original form is clearly demonstrated by its use as insulating material for the magazines of warships, walls of buildings, refrigerator-cars, and ice-houses, for which purposes it is now considered a failure because of the settling of the wool, which obviously decreases its area and sooner or later effects an exposure of the wall.

By a series of experiments extending over a number of years, my purpose being to discover an inexpensive method of producing a self-sustaining mineral fibrous structure, I have discovered that by reason of the possession by mineral wool of properties heretofore unrecognized it is available under proper conditions for the construction of a body having the desirable characteristics mentioned—that is to say, I have discovered that mineral wool is capable of reduction to a bat or pulp and of having its glutinous sizing removed by pressure, as distinguished from asbestos, which is incapable of such treatment, the products of this treatment being an extremely light non-conductive body having a self-sustaining structure, as distinguished from the stiff clay-like structure of commercial asbestos. The essential distinction appears to be that the light fibrous nature of mineral wool is retained in the article because the moisture or sizing is expressed therefrom, as distinguished from the necessity for evaporation of such moisture from asbestos pulp.

The property of mineral wool which I have discovered and which has made possible the

production of the article to be hereinafter more fully described is the capability of the wool for having the moisture forced there-through and removed therefrom by compression, which treatment unites the fibers of the body and leaves it porous and spongy.

In the accompanying drawings, Figure 1 is a sectional view through a mold, showing a mineral-wool brick in process of formation; and Fig. 2 is a detail perspective view of the finished brick.

In carrying out my invention I first subject the loose mineral wool to the cleansing action of clear water, the wool during this step of the process being reduced to a pulp-like state. It is then removed from the water and passed into another receptacle, into which a suitable sizing is poured, and the same mass thoroughly stirred until a thick viscous consistency is secured. The sized wool pulp is finally run into a mold 1, having a wire or other gauze bottom 2 of small mesh, and the viscous mass is then subjected to pressure within the mold for the purpose of pressing the moisture or sizing through and from the wool and for imparting to the latter the form in which it is desired for use. The alkaline sizing expressed from the pulp may be and preferably is caught in a suitable drip-receptacle 3, located below the gauze bottom, and after being strengthened by proper addition may be used for the subsequent sizing of other bodies of wool fiber.

When the above process is employed for the production of insulating-bricks, the resultant article is a light spongy porous insulating-brick 4 of one-fourth the weight of an ordinary clay brick and a brick made from asbestos or asbestos and a filler, wherein the moisture or water being allowed to evaporate is then submitted to the same pressure and is still twice the weight of a mineral-wool brick. The particular sizing employed in carrying out my process is not essential to the production of the novel insulating body described, but is preferably a weak alkaline solution—such, for instance, as silicate of soda reduced to nearly the specific gravity of water.

From the foregoing it will appear that I have produced by a novel process a novel fibrous article—to wit, a brick or like article of mineral wool having a structural formation capable of sustaining the original form of the article; but I wish it to be distinctly understood that I do not limit myself to an article of any particular form or design, since it is obvious that the invention or discovery comprehends the production of an insulating-body of the character described irrespective of its particular contour or dimensions.

What I claim is—

1. The method of producing fibrous articles from a pulp of mineral wool and a sizing, which consists in forcing the sizing through and the excess of sizing from the mineral pulp by compression.

2. The method of producing self-sustaining molded articles which consists in mixing mineral wool with a sizing to produce a pulp, and finally imparting the desired form to the pulp and simultaneously forcing the sizing through and the excess of sizing from the pulp by compression.

3. The method of producing self-sustaining molded articles which consists in mixing mineral wool with a sizing to produce a pulp, and finally imparting the desired form to the pulp and simultaneously forcing the sizing through the pulp by compression and also forcing the excess of sizing from the pulp in the direction in which the pressure is applied.

4. The method of producing self-sustaining molded articles which consists in mixing mineral wool with a sizing to produce a pulp, next confining the pulp, and finally imparting the desired form to the pulp by the application of pressure at the side thereof to simultaneously force the sizing through and the excess of sizing from the pulp only in the direction in which the pressure is applied.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEORGE KELLY.

Witnesses:

PHIL ALLEN, Jr.,
FRANK E. HANSCOM.