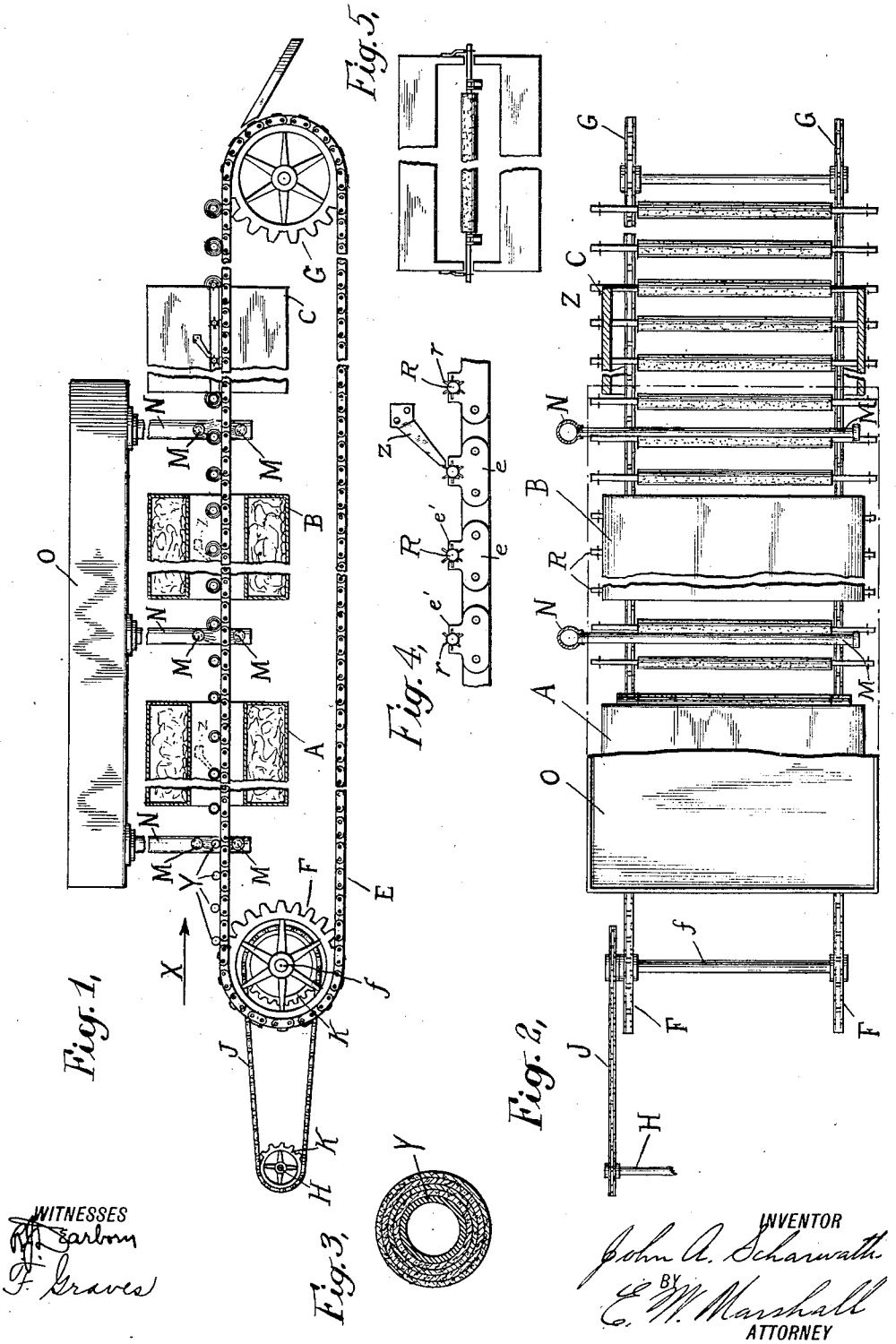
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PROCESS OF PRODUCING HEAT INSULATING MATERIAL.

APPLICATION FILED AUG. 20, 1914.

1,178,027.

Patented Apr. 4, 1916.



# UNITED STATES PATENT OFFICE.

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## PROCESS OF PRODUCING HEAT-INSULATING MATERIAL.

1,178,027. Specification of Letters Patent. Patented Apr. 4, 1916.

Application filed August 20, 1914. Serial No. 857,667.

*To all whom it may concern:*

Be it known that I, JOHN A. SCHARWATH, a citizen of the United States, and a resident of Elizabeth, county of Union, and State of New Jersey, have invented certain new and useful Improvements in Processes of Producing Heat-Insulating Material, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to processes of producing heat insulating materials and has special reference to the production of such materials as comprise alkaline silicates either alone or in combination with other materials as hereinafter described.

In Patent No. 1,092,402 granted to me April 7th, 1914, on an application filed October 3, 1908, I have set forth and described a process for producing heat insulating materials of the same general character as those produced by my present invention.

One object of my present invention is to produce heat insulating articles of convenient shapes for commercial use by a simple and improved process.

Other objects and advantages of my invention will be set forth hereinafter, and in order that my invention may be thoroughly understood I will proceed to describe the same in the following specification and then point out the novel features thereof in appended claims.

Referring to the drawings: Figure 1 of the accompanying drawings is a sectional elevation and Fig. 2 a plan view of suitable apparatus for practising my invention. Fig. 3 is a transverse section of an article formed by the use of the process of my invention and the apparatus shown in Figs. 1 and 2. A detail view of the conveyer chain and the actuator, for turning the cores in the furnaces, is shown in Fig. 4. Fig. 5 is an end view of one of the furnaces of Figs. 1 and 2.

The specific details of the apparatus illustrated are not essential to my present invention and are merely shown for the purpose of making the process of my invention perfectly clear.

A, B and C are a series of heaters or furnaces, each of which is preferably of considerable length to insure the thorough drying of the coating on the cores.

E is a conveyer or endless belt which is mounted on double sprockets F and G. The sprockets F are mounted on a shaft *f* which is driven by any suitable means such as a driving shaft H, to which it is connected by a chain J and suitable gears K. The direction of movement of the belt is indicated by the arrow X, and its structure is such that cores Y of cylindrical or other suitable shape, may be placed upon it.

Adjacent to the inlet opening of each furnace is a set of discharge pipes M which are supplied with a suitable liquid through pipes N from a tank O, which may be located at a distance from the furnaces as for example on a higher floor of the building. Each of the discharge pipes M is preferably provided with a large number of small openings or perforations in order that the liquid may be sprayed onto the cores as they pass between the discharge pipes on the conveyer. The cores Y are preferably hollow cylinders or pipe sections and have plugs or rods R extending outwardly from their ends. The conveyer chain has a plurality of links *c* (see Fig. 4) which are provided with notched or forked projections $c^1$ to receive and hold firmly the end rods R of the cores. The end rods R have a plurality of pins *r* which are spaced apart circumferentially. These pins are successively engaged by stationary arms or projections Z with which the furnaces are severally provided, the arrangement being such that each core is turned through an angle of approximately 90° as it is passing through each furnace. By this means the thorough drying and baking of each layer is insured.

While I have only shown three furnaces and three coatings on the core illustrated in Fig. 3, I have found it desirable to employ a larger number of furnaces because each layer is relatively thin and twenty layers, for example, may be provided to advantage.

The operation of the apparatus is as follows: Assuming that the conveyer is in motion, the cores Y are placed on the conveyer as shown in the drawings; as each core passes between the discharge pipes M which are adjacent to the furnace A, it is coated with a heat insulating material in liquid form, and immediately afterward, is carried into the furnace, where the coating is dried and baked. Each core is turned by the arm Z as it reaches an intermediate point in the furnace to insure that it is uniformly dried and baked. As the coated cores pass under the discharge pipe M near the furnace B, a

new coating of liquid is applied, which is in turn dried and baked in the oven B. The process is repeated at the oven C and for each succeeding oven which may be employed.

Any desired number of ovens may be employed, a hollow cylindrical body of heat insulating material being gradually built up on the core, and each successive layer of the body being individually dried and baked.

The heat insulating material in liquid form may consist of any of the various grades of silicate of soda or potash, either as single or double silicates. These materials may be used alone or a minor portion of one or more of the following materials may be mixed with the silicates, according to the use for which the heat insulating material is adapted; carbonate of magnesia, oxid of magnesia, infusorial earth, chlorid of calcium or any of the various compounds of metallic and non-metallic elements. The temperture of the furances may be varied from 100 to 1,000 degrees Fahrenheit, depending on the composition of the liquid and the speed at which the apparatus is run.

The cores may each be coated with some suitable material such a graphite to facilitate the removal of the finished product or a lining of asbestos paper or other suitable fabric may be placed upon the core before the coatings are applied. When the hollow cylindrical or tubular articles are moved from the cores on which they have been produced, they may be machined or otherwise treated on the exterior to provide a finished surface and may be cut longitudinally in order to prepare them for use as lagging for pipes and for other similar purposes.

By forming the material in layers which are relatively thin and each of which is dried and baked before another layer is applied, the finished produce is free from large cavities and blow holes which have been very hard to avoid when the processes hitherto known, were employed.

It may be found of advantage to deposit upon each layer of silicate, some other suitable material before the core is passed into the furnace, and various details of my improved process may be varied within the spirit and scope of my invention. I therefore intend that only such limitations be imposed as are indicated in the appended claims.

What I claim is:

1. A process of producing heat insulating material that consists in alternately coating a core of desired shape with a liquid comprising alkaline silicates and subjecting the coated core to heat of a pre-determined temperature.

2. A process of producing heat insulating material that consists in passing a core of desired shape through a plurality of furnaces and depositing upon the core just before it enters each furnace, a coating of liquid comprising alkaline silicates.

3. A process of producing heat insulating material that consists in alternately subjecting a continuously moving core to a deposit of liquid comprising alkaline silicates and to heat of a pre-determined temperature, sufficient to dry and harden the silicate compound deposited upon it.

4. A process of producing heat insulating material that consists in passing a plurality of cores, having the shape required for the finished product, successively through a plurality of furnaces, and depositing a coating of liquid primarily comprised of alkaline silicates on the cores before they enter each of the furnaces whereby each core is alternately coated with liquid and heated.

In witness whereof, I have hereunto set my hand this 19th day of August 1914, in the presence of two witnesses.

JOHN ANDREW SCHARWATH.

Witnesses:
R. J. DEARBORN,
F. GRAVES.