April 11, 1939. J. J. RAWLINGS 2,154,355

WALL AND LIKE PLUG

Filed Jan. 25, 1937

Fig. 1.

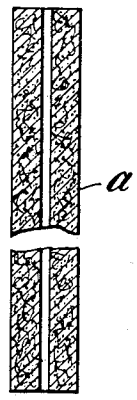

Fig. 3.

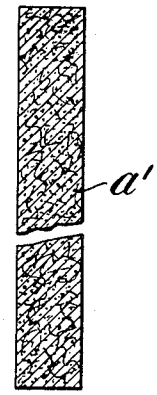

Fig. 2.

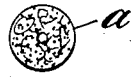

Fig. 4.

INVENTOR

JOHN J. RAWLINGS

By Norris & Bateman

ATTORNEYS

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WALL AND LIKE PLUG

John Joseph Rawlings, London, England, assignor to The Rawlplug Company Limited, South Kensington, London, England

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In Great Britain January 25, 1936

4 Claims. (Cl. 72—105)

This invention relates to wall or like plugs intended to be inserted, forced or rammed into holes in bricks, stone, plaster and like materials with a view to providing a suitable lining or filling in the hole for the reception of a nail, screw or like fastening driven into the plug previously inserted into the hole and thereby ensuring a firm holding of the said fastening therein.

It is usual for this purpose to employ tubular wall plugs constructed or fibre or metal which upon entry of the screw are expanded and forced against the interior walls of the hole. In the use of such wall plugs it is important that the hole be only slightly larger than the diameter of the plug, otherwise insufficient keying against the wall of the hole is obtained.

In certain materials, for example, certain types of plaster or poor concrete it is exceedingly difficult to make reasonably accurate holes owing to the tendency of the material to crumble or flake away, and the object of this invention is to provide a plug more especially suited for such cases.

It is obvious that fixtures may be made by filling in the hole with plaster, with or without admixture of fibrous material, into which the screw is driven before the plaster has set, but this naturally entails holding the fixture in position until the plaster has hardened.

By incorporating a considerable amount of fibrous material with the plaster it is possible to make an immediate fixing of comparatively light fixtures, but a considerable degree of skill is required to ensure effective insertion of the plug in the hole provided to receive it.

The object of this invention is to provide an improved composition of material in a convenient form which will enable firm fixtures to be made without the necessity of making accurate holes on the one hand or of mixing up special plasters on the other.

The improved material may consist of Portland cement, plaster of Paris, or other similar cement mixed with fibrous materials of mineral or vegetable origin, e. g. glass wool, metal wool, asbestos fibre, or silicate cotton. The fibrous material is previously impregnated with a soluble silicate, such as soda silicate, or other preserving or undilating agent in those cases where the nature of the fibre necessitates such treatment.

To the above mixture of cement and fibrous material may be added a portion of porous granular material, such as, ground pumice stone to act as a filling ingredient and as a carrier of moisture available to ensure setting of the cement. In some cases it is advantageous to include a small proportion of a dilating agent, such as, ammonium carbonate to ensure a certain amount of expansion of the composition when setting.

In order that the material may be available to the user in a convenient form it may be slightly moistened to bring it to a state in which it can be moulded or extruded into the form of solid or hollow rods. If water is used for moistening only sufficient is used to provide cohesion before setting of the cementitious constituents of the material and the rods are dried quickly after extrusion.

Instead of water a binding solution may be used consisting of a solution in alcoholic or other volatile solvent of any suitable gum or other material which is soluble also in water. On evaporation of the alcohol during and after extrusion the gum or other chemical will bind together the fibrous and cementitious constituents of the plug, but provided too much pressure is not used in extrusion the latter will remain sufficiently porous to enable it to absorb water when dipped therein.

In the accompanying drawing:

Fig. 1 shows a longitudinal section of a tubular wall plug of fibrous material and cement, in accordance with this invention, and

Fig. 2 shows an end view thereof.

Fig. 3 is a view similar to Fig. 1 showing a solid cylindrical wall plug and

Fig. 4 is an end view thereof.

The tubular rod *a*, Fig. 1, or the solid cylindrical rod *a'*, Fig. 2, may be made of any convenient length.

When the plug is to be put to use a length of rod is broken off and dipped or soaked in water to bring it to a plastic state. It is then inserted into the prepared hole and rammed home until it entirely fills the latter.

The fixture may now be immediately screwed up, the entry of the screw causing sufficient expansion of the fibrous constituents to provide sufficient keying to hold the fixture in place until the cementitious constituents have hardened and thereby effected a final firm mixture.

The form in which the plug is delivered to the user may be either in solid cylindrical or tubular form, but in either case after it is moulded or extruded it is allowed to set to a sufficiently hard and cohesive state to withstand ordinary transportation and handling prior to use.

Alternatively, the fibrous material while dry may be formed into short rods or sticks of a convenient diameter and enveloped in a paper sheath, or other suitable porous envelope, so that

they retain their form and when inserted in the hole can easily be thrust or prodded to the bottom of same.

I claim:

1. A wall plug of asbestos fibre and an unset mineral cement with the addition of a cement dilating agent.

2. A wall plug of asbestos fibre and an unset mineral cement with the addition of a cement dilating agent and loading material.

3. A wall plug of fibrous material and a mineral cement brought to a rod-like form and enclosed in a sheath of thin porous paper.

4. A wall plug composed of fibrous material and a mineral cement with the addition of a cement dilating agent moistened with a liquid to a degree to ensure cohesion without setting.

JOHN JOSEPH RAWLINGS.