To all whom it may concern:

Be it known that I, Harry M. Reynolds, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented new and useful Improvements in Linings for Tanks, of which the following is a specification.

My invention relates to improvements in linings for tanks designed to hold liquids, and it is especially designed for a lining to the wooden boxes which are used as flush tanks for closets. Its object is to provide such a lining cheaper and more efficient than those in common use. This object I accomplish by the construction shown in the accompanying drawings, which is a cross-section of a tank and lining constructed in accordance with my invention.

In the drawing the numeral 1 represents the ordinary wooden tank or box.

The numerals 3 and 5 represent the sheets of fibrous material or similar substance, and the numerals 2 and 6 represent coatings of waterproof material applied upon and between the sheets 3 and 5.

The numerals 7 and 7 represent suitable supports or stops held in their expanded position and pressing against the lining of the tank through the operation of the connecting spring 8.

As a basis or body of my lining I use a fabric, preferably of very open texture, like burlaps, or any fibrous material, as, for example, felt, even if not woven into fabric, or I may use a combination of felt and some fabric. I then coat this base or body with a waterproof adhesive material, like pitch or asphalt. For the best results I prefer not only to coat the base with this material upon one or both sides, but also to saturate the base therewith, and I do this by dipping it into a tank of the asphalt, or similar substance in melted form, and while hot, thus securing both saturation and coating upon one or both sides; or the base may be saturated first and afterward coated with a waterproof material by the use of a brush or mop, or in any other suitable manner.

The sheet of material thus produced, while perfectly waterproof, could not be used for tank lining since it would not, ordinarily, be self-supporting, and could not be glued or firmly attached to the interior of the box without being affected by the shrinking and swelling of the latter; or if some material should be found for the base, which, thus treated, would be sufficiently self-supporting, the waterproof coating would not retain its position, but, when heated, would flow down to the bottom of the sheet; and in any event the sheet could not be handled on account of its sticky and adhesive character. To make it extra self-supporting, and so that it will retain the desired position, and so that the waterproof material will not flow in an undesirable way and so that the sheet can be handled practicably, I unite with the pitch or asphalt, while hot, a proportion of a stiffening or tempering material in a finely pulverized condition. I use for this purpose powdered carbonate of lime, or marl, or other suitable powdered stone. This must be pulverized finely enough so the waterproof character of the composition will not be affected. I mix this pulverized material with the asphalt, or similar material, while the latter is hot, and a complete mixture can easily be made. The material will thus be tempered or stiffened in a varying degree, according to the temperature and conditions under which the complete article is expected to be used. This stiffening might be accomplished to a sufficient degree by spreading the stiffening material upon the outer surface of the hot plastic material on the lining; but I find it the most efficient way first to unite this powdered stone with the hot liquid asphalt in proper proportions and then to saturate and coat the fibrous material with the resulting composition. When this cools and sets, I have a sheet of material especially adapted for my purpose, which is absolutely waterproof and which can be bent without breaking, but which is stiff enough to be sufficiently self-supporting for the purpose for which it is designed and also flexible enough to be especially adapted for this use. The sheet of this material can be formed into the shape of the box which it is to line by any suitable forming or building up process, and such joints as result at the corners or elsewhere can be covered with a coating of the same, or other suitable composition, thereby making them waterproof or water-tight.

This lining can be used in one ply form and coated or saturated, or both, or it can be used in two or three ply forms. I have shown in the drawing a two ply form in which the complete lining has five layers, two layers of felt or fibrous material, the interposed layer of...
waterproof material, and the exterior layers of waterproof material, the whole forming one unitary body.

If a greater proportion of the stiffening material is applied, the resulting lining will be sufficiently rigid to retain its position permanently, and without any attachment to the box. If a less amount of stiffening material is employed, the lining may tend, under a considerable heat, to collapse. This result will not follow after the tank is in use and filled with water, as the temperature of water used for that purpose is low enough to keep the composition firmly set; but, in order to guard against collapse which might happen from temporary heat in shipping or storage, I may supply the interior of the boxes with temporary supports, shown in the drawing by 77. These are protected from adhesion to the interior surface of the lining by interposed waxed paper, or in any suitable way, and are held in contact with the interior of the lining by the spring 8. These keep the lining in shape during the shipping and storage, and will be taken out and thrown away when the lining is put into use. Similar supports can be used for the opposite side, or this temporary support could be provided in any suitable way.

Having thus described my invention, what I claim to have invented, and desire to secure by Letters Patent, is —

1. As a new article of manufacture, a lining for flush tanks composed of two sheets of fibrous material, a layer of water-proof material having a stiffening means interposed between the two sheets, a layer of water-proof material against the outer face of one of the sheets, and a layer of water-proof material against the outer face of the other sheet of material, said last-mentioned layers embodying a stiffening medium.

2. As a new article of manufacture, a lining for flush tanks composed of a base of fabric coated with a water-proof material embodying a stiffening medium.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HARRY M. REYNOLDS.

Witnesses:

A. C. DEXISON,
M. S. TOOKER.