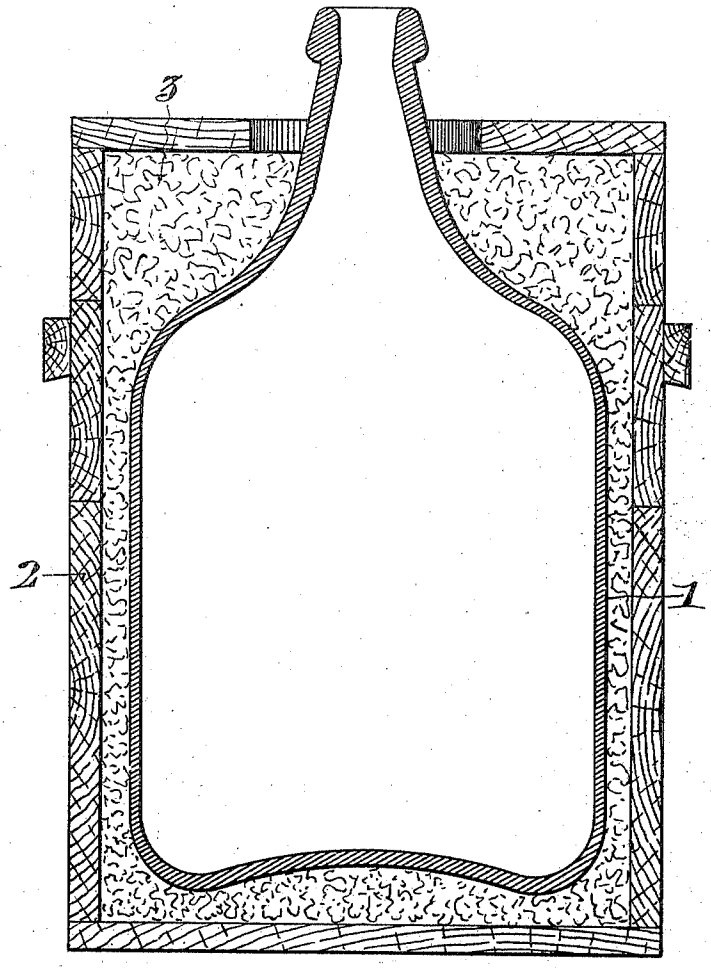
F. S. HAVENS.

CARBOY.

APPLICATION FILED JULY 23, 1908.

947,749. Patented Jan. 25, 1910.



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FRANKE STUART HAVENS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO HARRISON BROS. & CO., INC., OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CARBOY.

947,749. Specification of Letters Patent. **Patented Jan. 25, 1910.**

Application filed July 23, 1908. Serial No. 444,913.

To all whom it may concern:

Be it known that I, FRANKE STUART HAVENS, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Carboys, whereof the following is a specification, reference being had to the accompanying drawing, which represents a vertical central section through a carboy embodying my improvements.

The primary purpose of my improvements is to provide a carboy for the transportation of nitric acid, the escape of which by leakage or breaking of the receptacle is peculiarly dangerous, not merely because of its direct corrosive effect upon substances with which it may come in contact, but because of its tendency to cause ignition of combustible substances as a secondary consequence of the chemical attack.

The first desideratum in a package of this character is of course, to protect the glass carboy against shock and constant breakage, but a feature of scarcely less importance is the provision of means for neutralizing as much of the acid as possible when breakage or leakage actually does occur.

Heretofore various devices have been employed for the protection of carboys, such for instance, as the interposition of springs between the glass receptacle and its surrounding casing, and the employment of a layer of elastic packing around the casing. The former system of construction is open to objection, that when leakage or breakage does occur, the acid can escape freely and hence its injurious effects are not localized. Elastic packings, as heretofore employed have been also open to objections which may briefly be stated as follows: A packing of hay has been used, but, although this material is attacked by the acid, and hence to a certain extent prevents the escape thereof, the danger of fire is very great, since the combination with the acid develops, in the hay, conditions which are very likely to ultimately cause ignition. A packing of mineral wool has also been suggested for the purpose, but this material does not combine with the acid, and is in itself non-porous, so that very little of the acid is taken up by it, there being only a mechanical detention of a slight amount in the interstices of the packing, hence the main portion of the acid can escape and cause destructive action and ignition elsewhere.

I have discovered that organic material, preferably in a filamentary condition, when properly treated with certain so-called fireproofing substances, can be utilized as a packing for a carboy with highly advantageous results of a peculiar nature, viz.—the organic material thus treated does not resist the combination with the acid, but, on the contrary, submits to the attack thereof, and hence neutralizes, or combines chemically with a much greater quantity of acid than would be detained mechanically in the interstices of the packing. This action moreover, is attended by the remarkable result that although the acid theoretically ought to decompose the fireproofing ingredient, and hence rob the packing of its capacity to resist ignition, such effect is not in fact produced. On the contrary, the organic material, though directly attacked by the acid, and hence converted thereby, does not become inflammable, but remains practically innocuous, so far as any tendency to combustion is concerned.

The accompanying drawing represents, in vertical central section, a carboy embodying my improvements in a preferred form.

Referring now to the drawing, 1, represents a glass or vitrified receptacle of the ordinary carboy type, contained within a wooden box or casing 2. Intermediate between the exterior surface of the receptacle and the interior of the casing, is a packing 3, preferably of the fine wood shavings commonly known as "excelsior", but which may be of hay or other absorbent organic substance, preferably in a filamentary condition. This substance is arranged in what may be considered as practically a non-coherent mass, in the sense that its individual particles or filaments are loosely held together and are not definitely united. The individual filaments or particles of the mass are charged with a fire-proofing solution and then dried. I prefer to use a solution of aluminum sulfate for this purpose, but other equivalent fireproofing materials may be employed, such as for instance, tungstate of soda, or combinations of these salts. The packing is so disposed around the carboy as to protect the glass as far as possible against accidental shock, and to provide a sufficient mass

or layer beneath the bottom of the receptacle to combine with a substantial quantity of the acid, which would naturally drain downward. Under the above circumstances, it will be found that the power of the organic material to combine with, and thus actually neutralize a very large quantity of the acid, is practically undiminished by the fireproofing treatment, and that moreover, the resultant combination holds the acid in a substantially harmless state, since the tendency to cause ignition of the organic material, as a secondary consequence of the attack thereon, is nullified.

Having thus described my invention, I wish it to be understood that I do not claim broadly the fireproofing of organic material, nor the use thereof as a protection against an externally developed flame. The novelty and value of my invention is not based upon what may be considered to be the ordinary fireproofing effects of the substances employed, but reside in the fact that by the use of material of the character set forth, the direct attack of the acid is invited, and that although the expected consequences of such attack would be to decompose the fireproofing ingredient, and hence destroy or impair its capacity to protect the organic material, the fact is otherwise, for the fireproof qualities persist. Hence a packing of the character described presents in the highest degree the desiderata required for the purpose, viz.—that the maximum quantity of acid shall be neutralized by chemical combination, as distinguished from mere mechanical detention, while the peculiar and specific danger of such attack is nullified.

Having thus described my invention, I claim:—

In a carboy for the transportation of nitric acid and similar destructive materials, the combination of an external casing, an internal receptacle of vitrified material, and an intermediate packing, consisting of a non-coherent mass of absorbent organic material, whose individual filaments or particles are impregnated with a fireproofing substance of substantially the character set forth.

In testimony whereof, I have hereunto signed my name, at Philadelphia, Pennsylvania, this 15th day of July, 1908.

FRANKE STUART HAVENS.

Witnesses:

JAMES H. BELL,

E. L. FULLERTON.