2 Sheets—Sheet 1.

G. W. BRADLEY.

Material to be Used in the Construction of Boxes and other Receptacles.

No. 231,001. **Patented Aug. 10, 1880.**

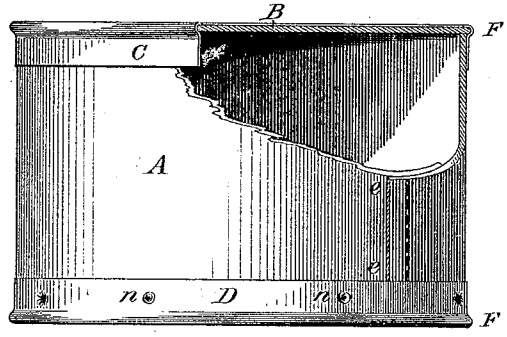


FIG. 1.

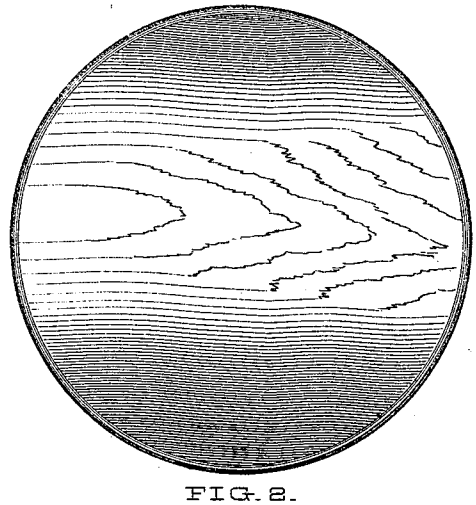


FIG. 8.

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2 Sheets—Sheet 2.

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Material to be Used in the Construction of Boxes and other Receptacles.

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FIG. 3.

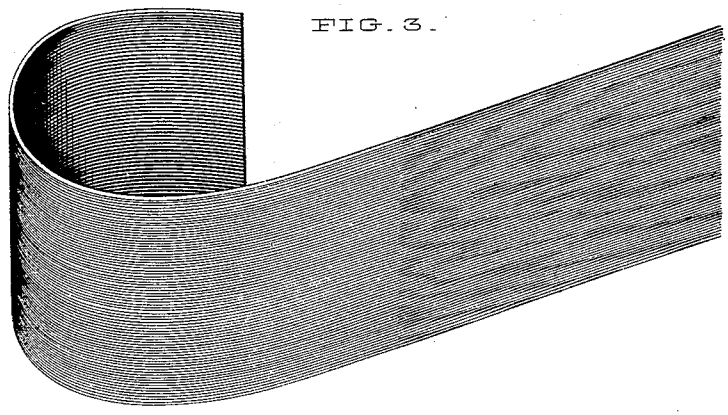
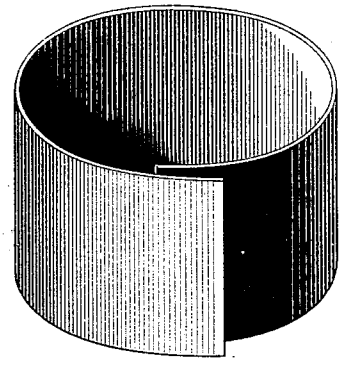


FIG. 4.



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UNITED STATES PATENT OFFICE.

GILBERT W. BRADLEY, OF SUNDERLAND, VERMONT.

MATERIAL TO BE USED IN THE CONSTRUCTION OF BOXES AND OTHER RECEPTACLES.

SPECIFICATION forming part of Letters Patent No. 231,001, dated August 10, 1880.

Application filed August 9, 1879

To all whom it may concern:

Be it known that I, GILBERT W. BRADLEY, of Sunderland, in the county of Bennington and State of Vermont, have invented an Improved Material adapted to be Used in the Construction of Boxes and Analogous Receptacles, of which the following is a specification.

This invention consists in an improved material adapted for use in the construction of packing-cases, boxes, rims, bands, and other cylindrical structures, which material possesses the attributes of curvature, density, external polish or finish, increased impermeability, and incapacity, after having been bent or curved, to straighten longitudinally.

The accompanying drawings fully illustrate my invention, wherein Figure 1 is an elevation of a cylindrical box or packing-case the tubular wall or rim of which is constructed from my improved veneer material. Fig. 2 is a plan view of the same box. Fig. 3 shows a section of veneer with one end curved, solidified, and externally smoothed or burnished, and the other or straight end as left in its unwrought condition, or as it came from the veneer-cutting machine. Fig. 4 exhibits a section of finished material wrought to dimensions, curved, solidified, and polished, ready to be incorporated into any structure for which it is adapted to be used.

My improved material is produced in the following manner: The wood or timber is selected with reference to its capacity for bending across the grain, and is sawed or cut into thin scale-boards, sheets, or veneers of the thickness best adapted for the use to which the finished material is to be applied. Such veneers are next cut into the lengths and widths (or duplicates of the width) of the part or parts of the structure into which such pieces are subsequently to be incorporated as constituent parts—that is to say, if the piece of veneer is designed to form the tubular or body part of a structure, like a pail or cheese-box, a butter-package, or a collar-box, such piece, while in its natural or flat condition, is preferably cut to its precise length and breadth, so that subsequent trimming will be unnecessary, although instances might occur where a surplus of width and length for such purpose might be desirable or necessary. The piece so fashioned is next bent and condensed or compressed by successively passing it through a series of sets of compressing and bending rolls of three rolls to a set. These rolls are similar to the rolls of a tin-pipe former, except that in each successive set the back roll is adjusted higher than in the last preceding set, so as to impart additional curvature to the material as it is passed through, and at same time produce additional curvature of the piece undergoing manipulation. The rolls of the last set are so adjusted as to impart to the veneer an extreme pressure, whereby the same becomes condensed or greatly solidified and stiffened, and at the same time bring the piece to the desired degree of curvature. This last step also imparts to the surface of the wood an extremely smooth and burnished or lustrous surface of satin-like appearance, in all respects superior to a surface finished with sand-paper or by any of the ordinary processes.

The process last above described is substantially the process of my Reissue Letters Patent No. 8,890, and the one which I preferably use. Its uses and application are found in the construction of a great variety of cylindrical structures, such as cheap temporary pails, butter-packages, collar-boxes, coffee and spice boxes, cheese-boxes, tobacco-packages, &c. It is cut and bent to the dimensions and curve ordered, and in that condition may be shipped to any point, to be subsequently worked up by the manufacturer as desired.

The excessive bulk of finished tubular boxes or packing-cases and the inordinately disproportionate charges for transportation of such wares for any great distance from the place of production has operated as a bar to the successful or profitable introduction of such goods into markets remote from timber-growing districts, where alone such wares can be successfully and cheaply manufactured. The process of bending so crimps and crushes the interior longitudinal fibers of the wood that its natural tendency to straighten is entirely counteracted; at the same time the material so bent is still left in condition to be closely packed for transportation.

This improved material is essentially differ-

ent in some of its characteristics from similar material bent in the ordinary way between ordinary sets of rollers.

My improved material is so much thinner, firmer, lighter, and so much more steadfastly rigid in whatever structure it may be incorporated that it has been adopted as a cheap and reliable substitute for tin in some cases, and for straw-board and pasteboard in others, and the qualities which have given it pre-eminence over metal and pasteboard are its curvature and the enhanced degree of solidity, inflexibility, thinness, smoothness, and non-liability to split, which are all attributable to repeated rollings under gradually-increasing pressures and in gradually-diminishing arcs, as hereinbefore set forth.

Inasmuch as the most valuable characteristics of my material are inherent in the substance of the manufactured product, and are to a certain extent both invisible and intangible, except by comparison with unwrought material, I have illustrated in Fig. 3 a strip of thin veneer, having one portion of its length curved, solidified, and externally smoothed, and the remaining portion of its length left in the same condition as when it left the veneer-cutter. It will be found that the curved portion is extremely hard, dense, stiff, smooth, and burnished, and that the unwrought portion is almost devoid of these attributes.

My material as cut, rolled, pressed, and finished ready for use is shown in Fig. 4. In this shape a large number of pieces of graded degrees of curvature may be rolled together and tied or otherwise secured for transportation.

In Figs. 1 and 2 a piece of material in all respects similar to that shown in Fig. 4 is shown as wrought into the body or rim of an ordinary case or box.

My veneer material is wrought dry without resort to steam, moisture, or heat to facilitate the bending process, and hence is less sensitive to humidity and climatic influences than woods which have been boiled or steamed in process of working. Hence

I claim as my invention—

As a new article of manufacture, a cylindrically-bent, solidified, and smoothed or burnished scale-board or veneer, substantially as specified.

In testimony whereof I have hereto set my hand this 26th day of July, A. D. 1879.

GILBERT W. BRADLEY.

In presence of—

FRANKLIN SCOTT,

J. A. WARDELL.