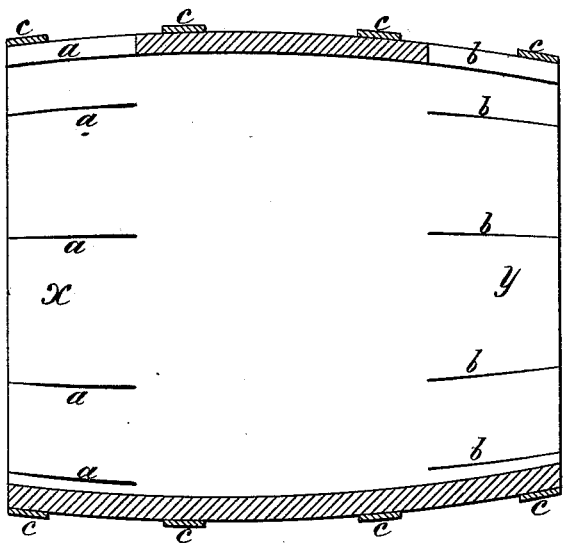
E. J. GRANGER.

PROCESS OF CONSTRUCTING BARRELS.

No. 187,973. Patented March 6, 1877.



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UNITED STATES PATENT OFFICE.

ELIHU J. GRANGER, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN PROCESSES OF CONSTRUCTING BARRELS.

Specification forming part of Letters Patent No. **187,973**, dated March 6, 1877; application filed May 20, 1875.

To all whom it may concern:

Be it known that I, ELIHU J. GRANGER, of Brooklyn, Kings county, New York, have invented an Improved Process of Constructing Barrels, of which the following is a specification:

My invention relates to the construction of barrels from gored sheets of wood; and it consists in forming the bulge of a barrel partially by the removal of the surplus material from the sheet, and partially by the annular compression of the cylindriform part of the barrel, progressively from the middle toward the ends.

The tapering parts of barrel-cylinders have been formed heretofore by annular compression, but in such case a great degree of force is required, and in attempting to form the bulge wholly by compression there is danger of crushing the fibers of the wood so as to separate them and destroy their structure.

Barrels have also been constructed of sheets of wood from which the entire amount of the surplus material has been removed by goring. In such a mode of construction, a considerable proportion of the fibers are shortened, and the shorter fibers are liable to shrink from or split off from the longer fibers when the bulge is formed; and, finally, there is an opportunity for such shrinkage of the wood as will open the seams formed by the opposite edges of the gores.

By my process only a portion of the surplus material is removed, and I thus preserve a larger share of the fibers at their full length. In order to obtain the full extent of the bulge which is required, I condense the fibers by annularly compressing the cylindriform sheet of wood, and thus produce a structure exhibiting superior qualities of strength and durability.

In my process, the quantity of material removed by goring and the degree of compression applied are varied in barrels and casks made of different kinds of wood and having different degrees of bulge. In applying my process to the construction of an ordinary flour-barrel, I prepare a flat rectangular sheet of wood, half an inch or so in thickness and twenty-nine inches in width with the fiber, and sixty-six inches long across the fiber, by cutting grooves or chimes parallel with and near the longer sides of the sheet, to subsequently receive the heads of the barrel, and by then cutting on each of the longer sides thirteen equidistant notches or gores, each half an inch wide at the mouth, and six inches or so in depth. Instead of a single sheet of wood, I may use two or more having the required area when placed together; but it is preferable to provide a single sheet of the required size.

Having been thus prepared, the sheet is curved and held in a cylindrical form by means of a suitable clamp, and is introduced into a compressing-machine substantially similar to that described and shown in Arcalous Wyckoff's patent, dated December 19, 1865.

In this machine the cylindriform sheet of wood is annularly compressed, so as not only to bring the opposite edges of the gores together, but to upset the fiber and condense the wood until the cylinder, from the middle to the ends, is progressively reduced to the desired diameter.

By this means the gores are closed up, so that no subsequent shrinkage of the wood will open them, and thus permanently-tight seams are produced. By this process a large proportion of the fibers are preserved at their full length, and they are compacted together, so that their presence adds materially to the strength and durability of the structure.

In the compressing-machine the cylinder is driven through hoops, which are deposited in their places upon it; or, if preferred, the hoops may be left out of the compressing-machine, and may be afterward driven on by hand.

The heads may be applied in the compressing-machine, or the cylinder may be allowed to stand for a day or so before the heads are inserted, which can be subsequently done in the usual manner by removing the end hoops.

The aggregate width of the cuneiform notches in the sheet of wood is, in my process, always less than the desired difference between the greatest and the least circumferences of the barrel-cylinder, in order that a portion of such difference may be produced by the annular condensation of the fiber. This difference in a barrel such as described will be about nine inches—six and a half inches being due

to the thirteen gores, and two and a half inches to compression.

When my process is applied to the construction of a barrel from hard wood—such as oak, for example—the gores are made wider and longer, but they are never made as wide, in the aggregate, as the difference between the circumferences aforesaid.

In applying my process, the operator will soon learn to vary the width of the gores according to the character of the wood which is being used, so that there will be a suitable degree of compression of the fiber.

I make no claim to constructing a barrel from a gored sheet of wood, nor to forming a barrel by compression; but

I claim as my invention—

The improved process of constructing wooden barrels herein described, which consists in forming a prescribed bulge shape, partially by the removal of a portion of the surplus material composing the cylindriform part of the barrel, and partially by the annular compression or condensation of such material, substantially as and for the purposes set forth.

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