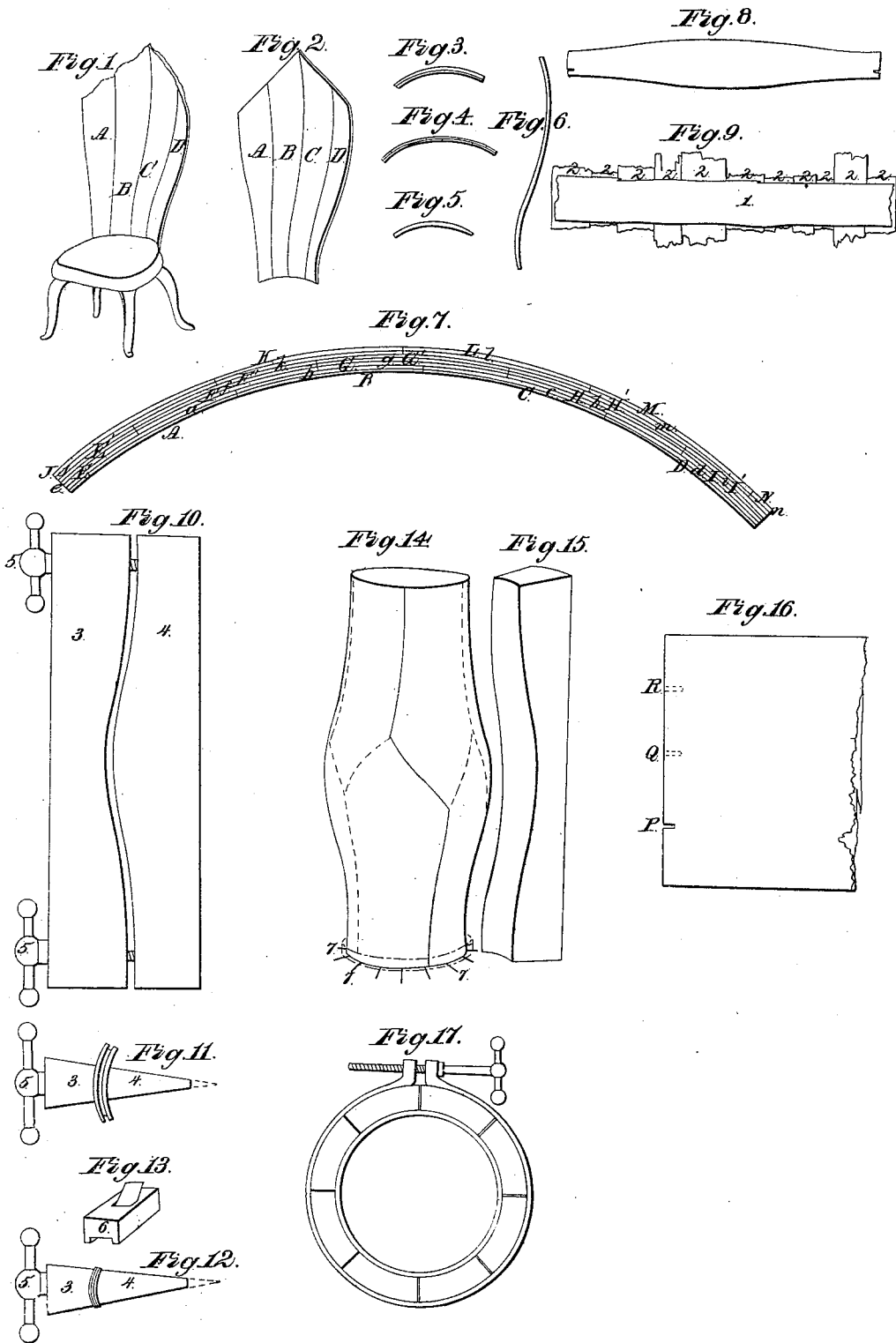


J. H. BELTER.
 MANUFACTURING FURNITURE.

No. 19,405.

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UNITED STATES PATENT OFFICE.

JOHN H. BELTER, OF NEW YORK, N. Y.

IMPROVEMENT IN THE METHOD OF MANUFACTURING FURNITURE.

Specification forming part of Letters Patent No. 19,405, dated February 23, 1858.

To all whom it may concern:

Be it known that I, JOHN HENRY BELTER, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Pressed-Work Furniture; and I do declare that the following is a full and complete description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a chair-back finished and carved. Fig. 2 is a chair-back roughly manufactured; Figs. 3, 4, and 5, horizontal sections of the same; Fig. 6, a vertical section of the same; Fig. 7, a horizontal section on a larger scale; Fig. 8, one of the compound staves of which the chair-back is composed. Fig. 16 shows the end of one of the staves on a larger scale. Fig. 9 indicates the appearance of the stave when unfinished. Figs. 10, 11, and 12 are clamps between which the rough staves, Fig. 9, are held to be shaped. Fig. 13 is a tool by which the edges of the stave are reduced. Fig. 14 shows the inside cawl, and Fig. 15 shows one of the outside cawls, by which the product is perfected. Fig. 17 shows a horizontal section of the internal and all the external cawls with the hoop and screw for compressing them.

My invention consists in giving increased beauty, strength, and other valuable qualities to what is termed "pressed-work" furniture, by constructing it of two or more layers of pressed-work staves, constructed and arranged in the manner and form fully represented and described in this specification.

Pressed work is invariably composed entirely of veneers and glue. The grain of each veneer is laid at right angles to that of the next, and the whole being firmly and smoothly glued together, it is a very strong and durable material. As veneers are not capable of being extended or compressed except to very slight extents, it has not been heretofore practicable to manufacture pressed work in any dishing forms. Pressed work has consequently been curved only in one plane, so that each part forms a portion of a hollow cylinder or cone; but by my invention each portion of the pressed work, when completed, forms a portion of a hollow sphere or spheroid, so that a section thereof in every possible plane exhibits a curved figure.

It is well known that the transverse strength of any material (other things being equal) is greatly increased by causing it to present a curved or irregular section along the line exposed to rupture. My dishing pressed work is from that cause stronger than that before known, as will be more fully explained below, and may consequently be made considerably lighter and somewhat cheaper.

To enable others skilled in the art to make and use my invention, I will proceed to describe it by the aid of the drawings, which represent a chair-back of this material with means for producing it.

My invention is not limited to the construction of chair-backs, but may be applied to all kinds of pressed-work furniture in which dishing is desirable.

Similar letters of reference refer to like parts in all the drawings.

Commencing on the front or inside, A B C D, Figs. 1, 2, and 7, are properly-shaped inside veneers, while *a b c d*, respectively, represent short pieces of transverse veneers previously glued upon the first.

A and *a* together compose one stave of the inner layer, and B *b*, C *c*, and D *d* compose the other staves of that layer. These staves are a little narrower than those of the next or middle layer.

E F G H I are the next veneers, the edge veneers E and I being narrower than the others in consequence of a portion thereof being incorporated in other similar chair-backs.

The small letters *e f g h i* indicate the short horizontal veneers previously glued to the last named, and E' F' G' H' I' indicate another set of veneers similar to E F G H I, but a little wider.

E *e* and E', previously glued firmly and continuously together, compose the first in the second or middle layer; and F *f* F', G *g* G', H *h* H', and I *i* I' compose, respectively, the other staves in this layer.

The next veneers, exterior to the middle layer just described, are short horizontal veneers *j k l m n*. They are previously glued to the outside veneers J K L M N, and with them form the third or outside layer of staves. More staves may be constructed and added, composing a fourth or fifth layer, if desired; but it is important that the last or exterior

veneer shall be of good material and with the grain running vertically, as such has a much better appearance than would be presented by horizontally-grained veneers. In short, the veneers A B C D, which, when the work is in place, are exhibited to the observer on the front side, and the veneers J K L M N, which are shown on the back side, should be rose-wood, or the like highly-prized wood, while all the rest may be oak, hickory, black-walnut, or other cheap wood. There are perfectly-close joints in this work distributed so as not to be opposite to each other. By reference to Fig. 7 it will be especially observed that the joint between the stave A *a* and the stave B *b* is not opposite to the joint between the stave F *f* F' and the stave G *g* G'; nor, again, is the latter opposite to that between J *j* and K *k*, and this distribution adds to the strength of the work.

The means I have adopted for giving the proper form to the staves and correctly applying them together is as follows: I take sufficiently long strips of veneer 1, Fig. 9, and covering the whole of one side with glue, apply to it the short pieces 2 2, &c., and compress the whole between either plane or slightly-dishing cawls until cold. Then laying a sufficient number of these, which may be termed "rough staves," together between the clamps 3 and 4, Figs. 10, 11, and 12, I turn the screws 5 5, and confine them while I apply the peculiar plane 6 and reduce the edges to the condition shown in Fig. 12. The clamps 3 4 are wedge-shaped in section, as represented, and the staves which lie nearest the left or outer side of the clamps are therefore widest when finished; but the edges of all are trimmed perfectly to the proper shape. This operation shapes the staves. On removing the staves from the clamp I assort them, and, placing all the narrowest or inside staves in a suitable fixture, (not represented,) I saw a score in each end, as shown by P P in Figs. 8 and 16, so that the score is in the same position in all the staves of this inner layer. I do the same with the middle and outside staves, except that the score must be placed in a different position Q Q or R R in one or both of the latter. Having properly heated the heavy inside cawl shown by Fig. 14, and also a suitable number of corresponding outside cawls, one of which is shown by Fig. 15, and provided suitable means of clamping the whole very firmly together, I apply glue to the exterior face of an inner stave and insert one end within a ring represented in red, resting the score P astride the edge of one of the knives 7, which latter are fixed edge upward around the base of the cawl, Fig. 14. The upper end is then placed within a similar ring at the top and the upper score fixed astride a similar knife. (Not represented.) This process being repeated with all the inner staves, it follows that all of this series are held in exactly their proper positions to match perfectly together, or are held ready to be

forced into such position so soon as the pressure is applied from outside. The staves of the middle series are next immediately applied, and as the scores in their ends are also placed astride of the knives 7 their joints necessarily come in different positions from those of the inner series. I repeat this process for any number of layers of staves, working rapidly to prevent the glue from becoming cold before the placing of the staves is completed. When all are in this position, the outer cawls, Figs. 15 and 17, are applied and compressed. On the removal of the latter some twenty-four hours afterward the new artificial product, which I term "dishing" pressed work, envelopes the interior cawl, and is removed by cutting with a knife or saw along the lines indicated. One such lot of the material produces eight chair-backs, four above and four below, the tops being cut, as represented, to facilitate an ornamental finish.

I have minutely represented and described only a chair-back with the means for producing the same; but the cawls and clamps require simply to be varied in form to produce suitable staves and molds for constructing other articles in a similar manner.

This work is more graceful in appearance and better adapted in form to its intended use than ordinary pressed work, and is much stronger and stiffer. The dishing form in effect adds to the thickness of the material.

When a transverse strain is applied to my pressed work in any direction whatsoever, the force tends to compress a portion or portions of the material and to extend another or others, thus greatly increasing its ability to withstand such strains according to laws well recognized. The pressed work made in the ordinary manner of sheets simply glued together without being formed into staves is capable of being curved or bent in one direction only.

My work is capable of resisting with great power transverse strains applied in any direction and tending to break it along any line. In the method of construction I have described the whole assumes exactly the form desired without splitting or wrinkling and with all the joints mathematically close and perfect.

I do not claim the simple pressing of veneers and glue between dies or cawls, one of which is convex and the other or others concave; nor do I claim the so gluing of veneers together that the grain of each stands at right angles to that of the next; but,

Having now fully shown the nature and construction of my improved pressed work, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The within-described method of accurately finishing at one operation a suitable stave for each layer, of the spherical work herein described, viz: the applying together of as many of the roughly-manufactured staves as there are to be layers in the work, and bending the whole between the clamps of

the form and bevel required and removing the superfluous material by a plane or its equivalent, substantially as and for the purposes set forth.

2. The applying together of the edges of the staves of the several layers at one operation by confining the staves in their proper positions at one or more points and compelling the remainder of the edges to guide each other as the cawls are compressed, substantially in the manner and for the purposes set forth.

3. The within-described method of accu-

ately breaking the joints of the several layers of staves by notching the ends of the staves of each layer differently from the staves of the other layers and resting the notches of all the staves across knife-edges projecting perpendicularly from the surface of the inside cawl, all in the manner and for the purposes within set forth.

J. H. BELTER.

Witnesses:

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