(No Model.) 2 Sheets—Sheet 1.

C. WITTKOWSKY.

METHOD OF MANUFACTURING WOODEN RELIEF PLATES.

No. 379,301. Patented Mar. 13, 1888.

Fig. 1

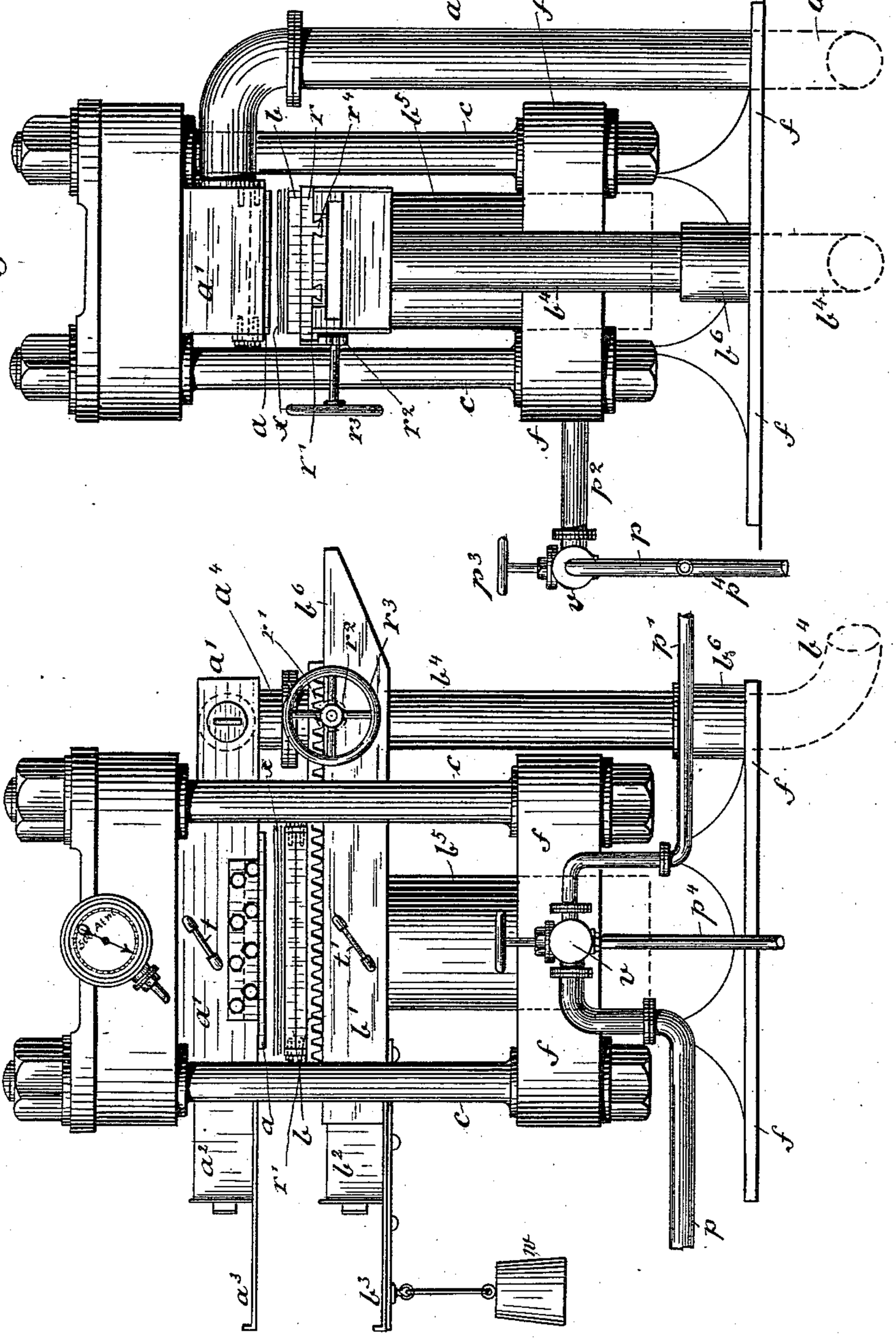

Fig. 2

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E. F. Scheler.

Inventor:
Carl Wittkowsky,
By: Robert Dressler.
his attorney in fact.

(No Model.) 2 Sheets—Sheet 2.

C. WITTKOWSKY.

METHOD OF MANUFACTURING WOODEN RELIEF PLATES.

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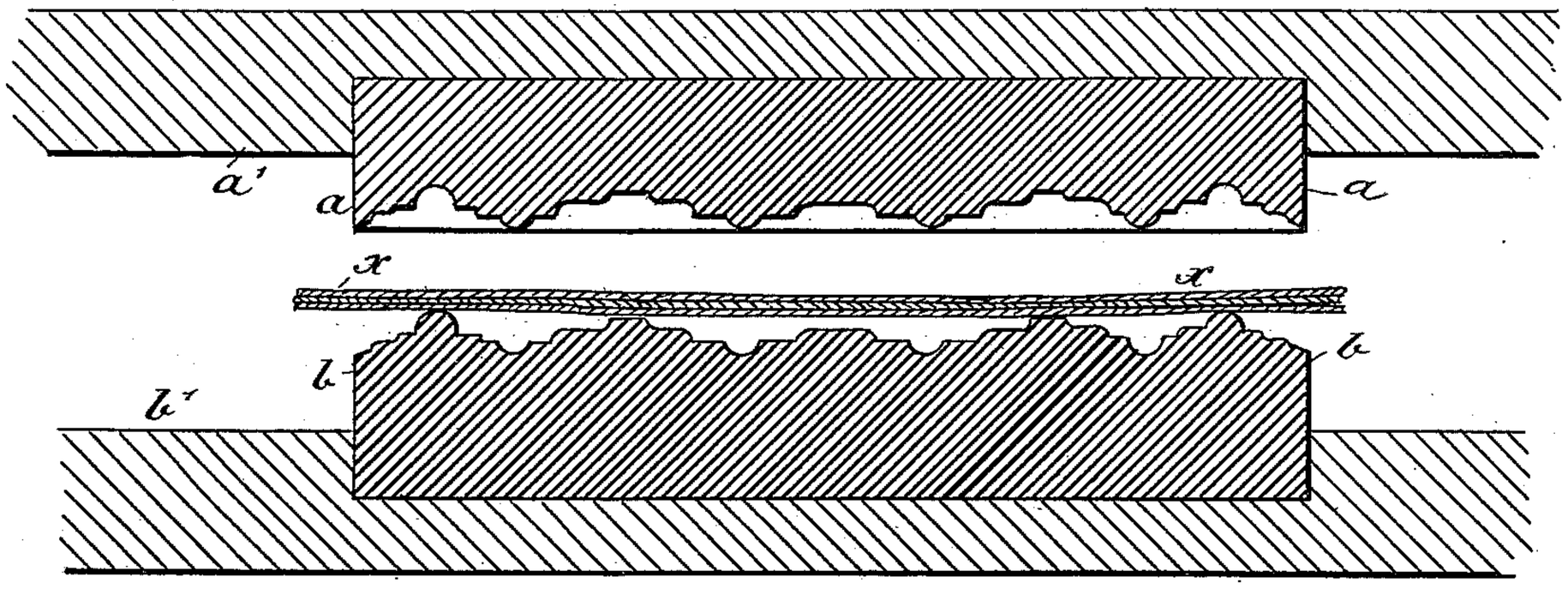
Fig. 3



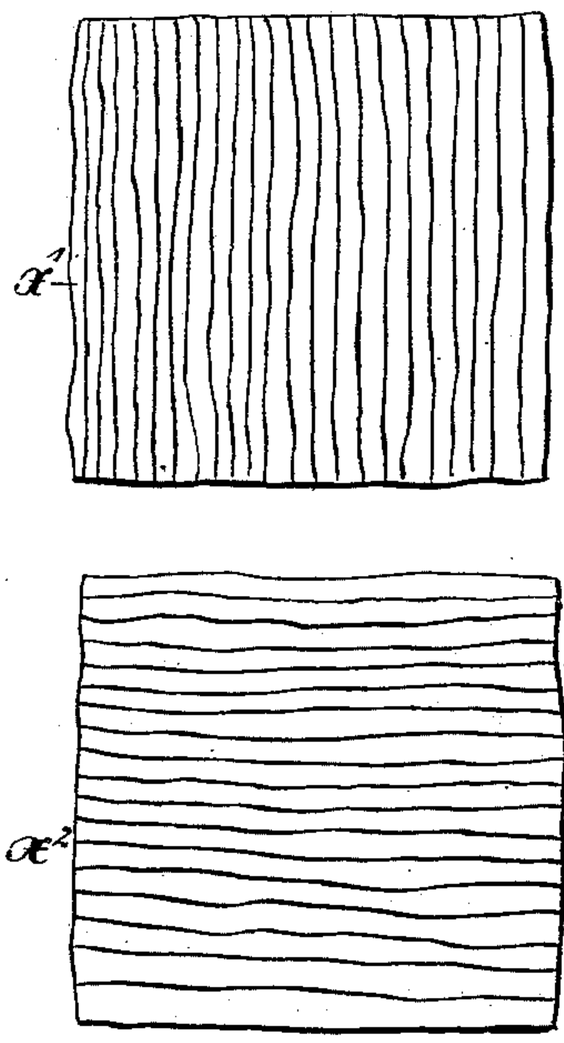


Fig. 4

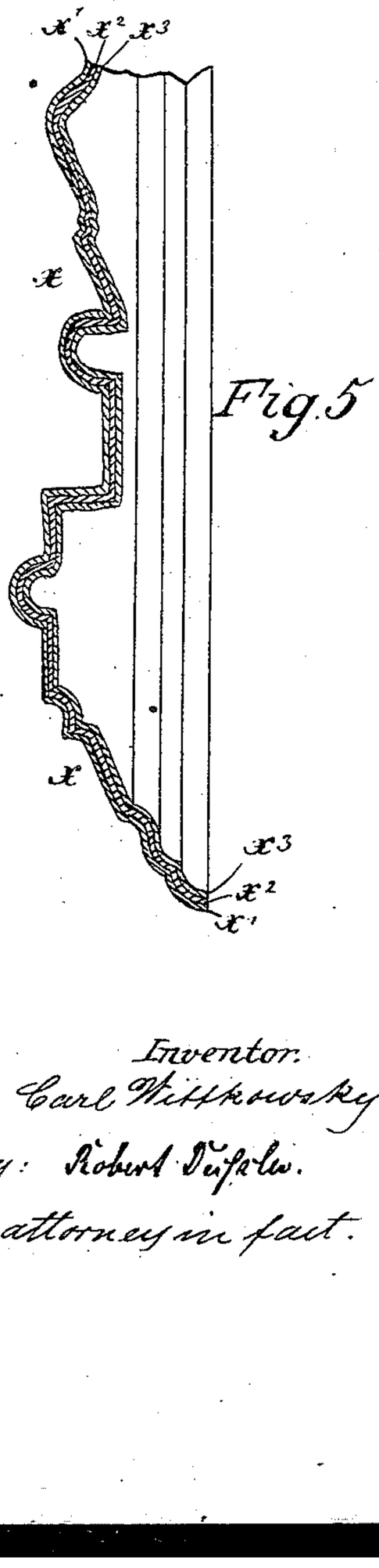


Fig. 5

Witnesses,
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UNITED STATES PATENT OFFICE.

CARL WITTKOWSKY, OF CHARLOTTENBURG, NEAR BERLIN, GERMANY.

METHOD OF MANUFACTURING WOODEN RELIEF-PLATES.

SPECIFICATION forming part of Letters Patent No. 379,301, dated March 13, 1888.

Application filed November 23, 1886. Serial No. 219,723. (No specimens.)

To all whom it may concern:

Be it known that I, CARL WITTKOWSKY, a subject of the Emperor of Germany, residing at Charlottenburg, near Berlin, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in the Method of Manufacturing Wooden Relief-Plates, of which the following is a specification.

My invention relates to a method of manufacturing wooden relief-plates, which are also used in the place of genuine leather relief-plates, and which have all the good qualities of the latter.

My method of manufacturing these wooden relief-plates is as follows: I take a number of wood-veneering plates—as many as may be required to give the relief-plates the necessary thickness—and join all these plates in a block by pressing them against each other. Before pressing them together I give them such a coating of cementing medium, either on one side or on both sides, which only gets softened after being dried on the plates at a certain degree of heat or warmth, and which dries again as soon as the temperature rises a few degrees more. The uppermost and the undermost plates receive a coating of this special medium only on one side—that is to say, on that side with which they come in contact with the other plates. To the outside of the uppermost or cover plate, on the side visible to the eyes, I apply a mixture consisting of some suitable color and of a water-proof cementing medium. Likewise in this case I prefer to use a cementing medium of the same qualities as that applied to the other plates of the block. By this mixture a correct connection between the color and the wood is gained, so that the color never can loosen itself from the wood. By these means the veneering-plate receives the appearance of a genuine leather relief-plate.

I am aware that wood-veneering plates have been made heretofore by laying two plates crosswise, one upon another, and by gluing or cementing them on the adjoining sides by a common cementing medium and by applying a water-proof finishing on the outside, and by then putting these two plates between a press until the cementing medium becomes dry or nearly so and the plates are joined. After this was done the plates were run through pebbling or embossing rolls of a pebbling or embossing machine, so as to give them the appearance of leather, and subsequently they were colored and shellacked and varnished in the ordinary way of finishing leather boards. All these different operations to produce these leather-like wood-veneering plates—namely, the joining, embossing, coloring, and finishing—have been heretofore made, but subsequently one after the other. I am not aware, however, that such wood-veneering plates were joined, and colored, and finished up, all at the same time, and thereby rendered thoroughly water-proof.

To give a better understanding of my invention I have annexed to this description two sheets of drawings, in which—

Figure 1 is a side elevation of the press which I use in the manufacture of my wood-veneering plates. Fig. 2 is a front elevation of the same. Fig. 3 shows the matrix and patrix of the press and the plates in section on a somewhat larger scale. Fig. 4 shows the way in which the plates are laid one upon another, and Fig. 5 shows part of a veneering-plate in section as it comes out of the press.

Similar letters indicate similar parts throughout the figures.

The press which I use for the contemporary joining and pebbling and embossing, and which is shown in Figs. 1 and 2, has a stationary matrix, *a*, and a movable patrix, *b*. The matrix as well as the patrix is heated by means of charcoal or briquette fire, which is put in the vessels a^2 b^2, that glide on the sheet-iron plates a^3 b^3, and are pushed into the furnaces a' b'. To these furnaces are screwed the matrix *a* and patrix *b*, so that they stand in a straight vertical line with their edges. The smoke goes off through pipe a^4 from the upper furnace and through pipe b^4 from the lower one, the heat in these furnaces being indicated by the thermometers *t* and *t'*, and consequently that of the matrix and patrix may well be regulated by simply drawing out or pushing in thev essels a^2 b^2. As already stated, the matrix is mounted stationary with its furnace on four columns, *c c c c*, that rest on the foundation *f*.

The patrix *b* is not screwed directly to the furnace *b'*, but to a slide, *r*, that glides with its dovetailed guides r^4 r^4 in the top of the furnace *b'*. One side of this slide *r* is provided with a rack-bar, *r'*, that engages with a pinion, r^2. By turning the hand-wheel r^3, the slide *r*, with the patrix *b*, can be moved away from under the matrix, and can be brought on the extension b^6 of the furnace *b'*. This mechanism is only constructed for a better handling of the plates *x* by bringing them into the press.

The lower furnace, *b'*, is movable in a vertical line and can be raised or lowered as much as is needed. For this purpose the furnace is mounted on a strong tube, b^5, that glides in the foundation *f*. The raising and lowering of this tube b^5 is done by means of hydraulic pressure. The water comes through pipe *p* into pipe p^2, and is driven by a pump (not shown) that is just strong enough to raise the tube b^5, with furnace *b'* and patrix *b*, until the latter touches the matrix. Then the pump is stopped and pipe p^2 is shut off from pipe *p* and connected with *p'* by means of three-way cock *w*. Pipe *p'* is in connection with another very powerful pump, which puts the water in b^5 under very high pressure, and thus presses the patrix *b* strongly against the matrix *a*, thereby giving the plate *x*, resting on the patrix *b*, the relief which is cut into the matrix and is projecting out of the patrix. As the furnace *b'* is moving up and down, the pipe b^4 will do the same, and for this reason the pipe b^4 is made gliding in and guided by the box b^6. The furnace *b'* is much heavier on the right-hand side of Fig. 1, and to balance it there is hung up a counter-weight to the other side of the furnace *b'*.

Having now described the construction of the only press I need in the manufacture of my wood-veneering plates, I shall proceed to fully explain the process of joining and pebbling and embossing the plates.

Before putting the plates into the just-described press I prepare them by applying a cementing medium of the above-mentioned qualities—namely, albumen or caseine, or a mixture of both—which have the peculiarity that they get soft at 85° centigrade and harden and become perfectly water-proof when the temperature rises a few degrees higher. I also mix one of these two cementing mediums, or both together, with a suitable color and apply this mixture to the top side of the uppermost plate of a block; but I preferably use a mixture of albumen and caseine for the inside plates and a mixture of these two with color for the top side of the uppermost plate. Having done this, I lay the plates *x* with the grain crosswise one upon the other, as is shown in Fig. 4, and then I place them on the molds or form *b* (see Fig. 3) and set the pumps in operation, as already described. When the plates *x* are placed between the molds *a* and *b* and are pressed together, both the plates and the cementing medium gradually acquire the temperature prevailing in the molds and the cementing medium gets first soft and will finally harden as the molds are heated to about 95° centigrade and become perfectly water-proof. The mixture of color and cementing medium, with which the uppermost or cover plate is coated, undergoes the same changes, and the color becomes so closely and durably connected with the wood that the outer surface of this uppermost or cover plate assumes the appearance of a genuine leather relief-plate.

The pressing of the block lasts from one-half minute to two minutes, according to the thickness of the plates that are to be pressed. The molds (matrices and patrices) may be of any shape whatever, so that any desirable relief may be given to the plate.

The pressing-surface of the molds may be smooth or carved, for the purpose of producing a leather-like appearance. The uppermost plate may be of woven stuff or wood. In addition to this the uppermost plate need not have the coating of color and cement if it is not wished to give it the appearance of leather, and the plates may be only joined and pebbled or embossed at the same time.

The method just described can likewise be used in making albums and box-lids and in making any other kind of relief-plates, furniture, and fancy articles.

By a judicious selection of the thickness and number of the veneering-plates the elasticity of these wooden relief-plates can be made equal to that of genuine leather relief-plates. These wooden relief-plates can be made and finished in a much shorter time than heretofore, and can be manufactured at a much smaller expense than those of leather or those already known of wood. These wooden relief-plates show the relief much more sharply than the leather relief-plates, &c., do, which is owing to the form of the molds, of which the one shows the relief cut into it and the other one has the same projecting, so that the plate receives the relief on both sides exactly as it is cut into or out of the molds, while heretofore only one of the molds had the relief cut into it, so that it never could represent itself so distinctly on the wooden plate, as is the case with the plates made after my process.

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

1. A process of manufacturing wooden relief-plates, consisting in coating several veneering-plates with a cementing medium which only softens at a certain degree of warmth and that hardens again when the temperature rises a few degrees higher, then piling the plates thus prepared one above the other with the grain of each plate crosswise to the adjoining ones, then putting the pile between two heated molds of a press, of which the one has the design cut into it and the other the same projecting, and, lastly, subjecting the piles of plates to a strong pressure in this press, whereby the plates are thoroughly joined and receive the

relief distinctly as it is in the molds, all substantially in the manner as shown and described.

2. A process of manufacturing wooden relief-plates, consisting in coating several veneering-plates on both sides with a mixture of albumen and caseine as a cementing medium, then piling these plates one above the other with the grain of each plate crosswise to the adjoining ones, then putting this pile between two heated molds of a press, of which molds the one has the design cut into it and the other one the same projecting, and, lastly, subjecting the pile of plates to a strong pressure in this press, whereby the plates are thoroughly joined and receive the relief distinctly as it is in the molds, all substantially in the manner as shown and described.

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

CARL WITTKOWSKY.

Witnesses:
B. ROI,
W. PERCY TILGHMAN.