

(No Model.)

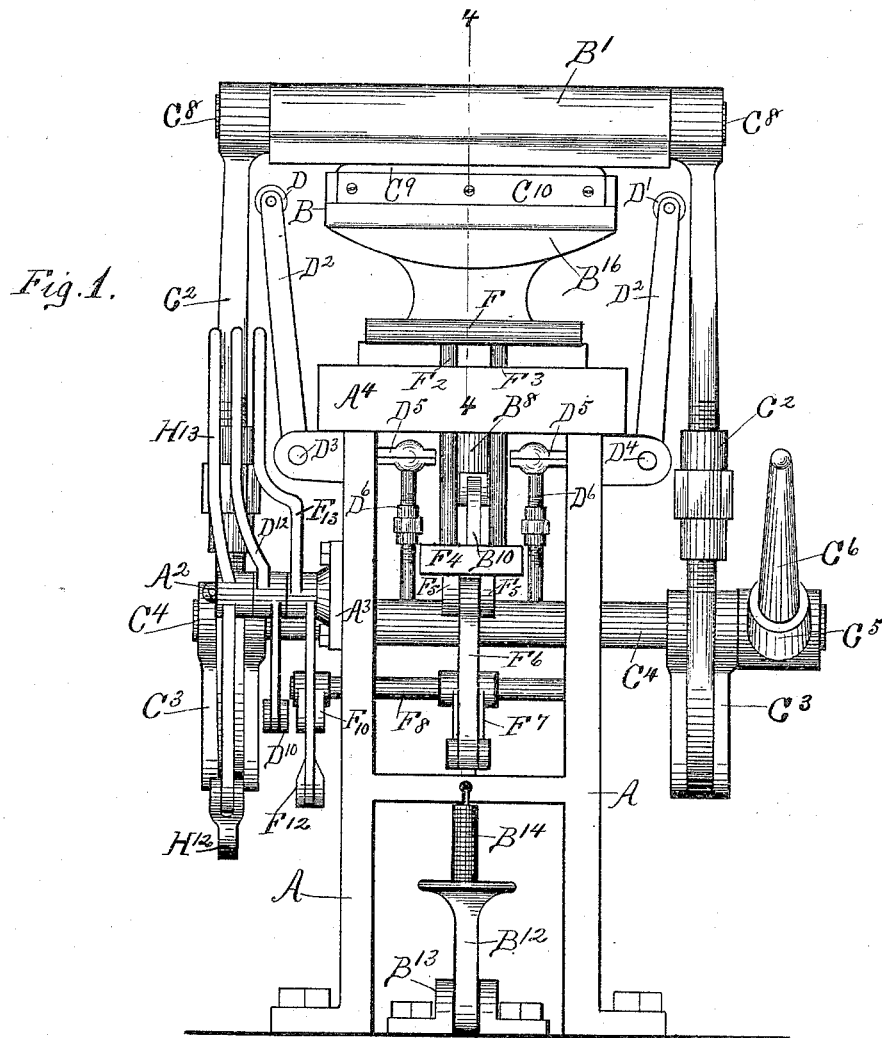
4 Sheets—Sheet 1.

J. M. BEIERMEISTER.

# APPARATUS FOR STARCHING FABRICS.

No. 493,905.

Patented Mar. 21, 1893.



witnesses:

Frank C. Curtis

John B. Taylor.

*Inventor:*

John M. Belcher Minister  
by Geo. Amoskey  
Atty.

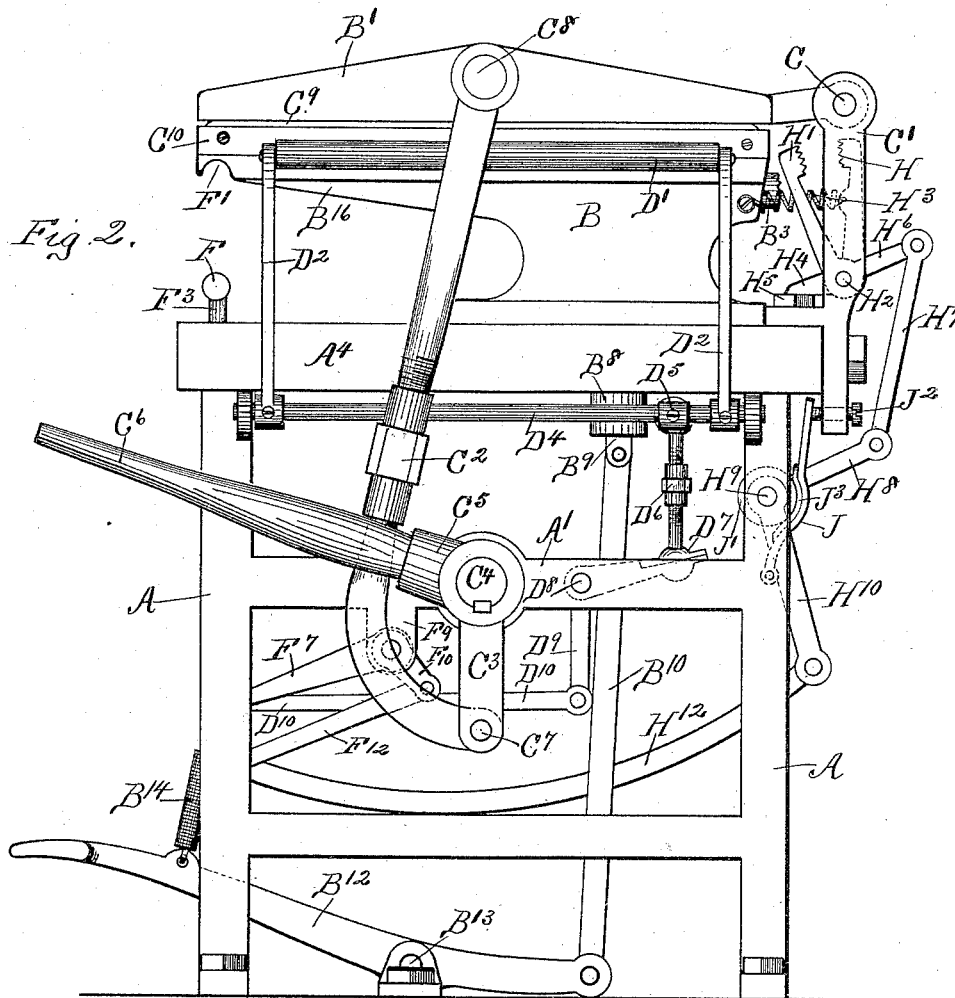
By Geo. Allwooke  
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J. M. BEIERMEISTER.  
APPARATUS FOR STARCHING FABRICS.

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Witnesses:  
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John B. Taylor.

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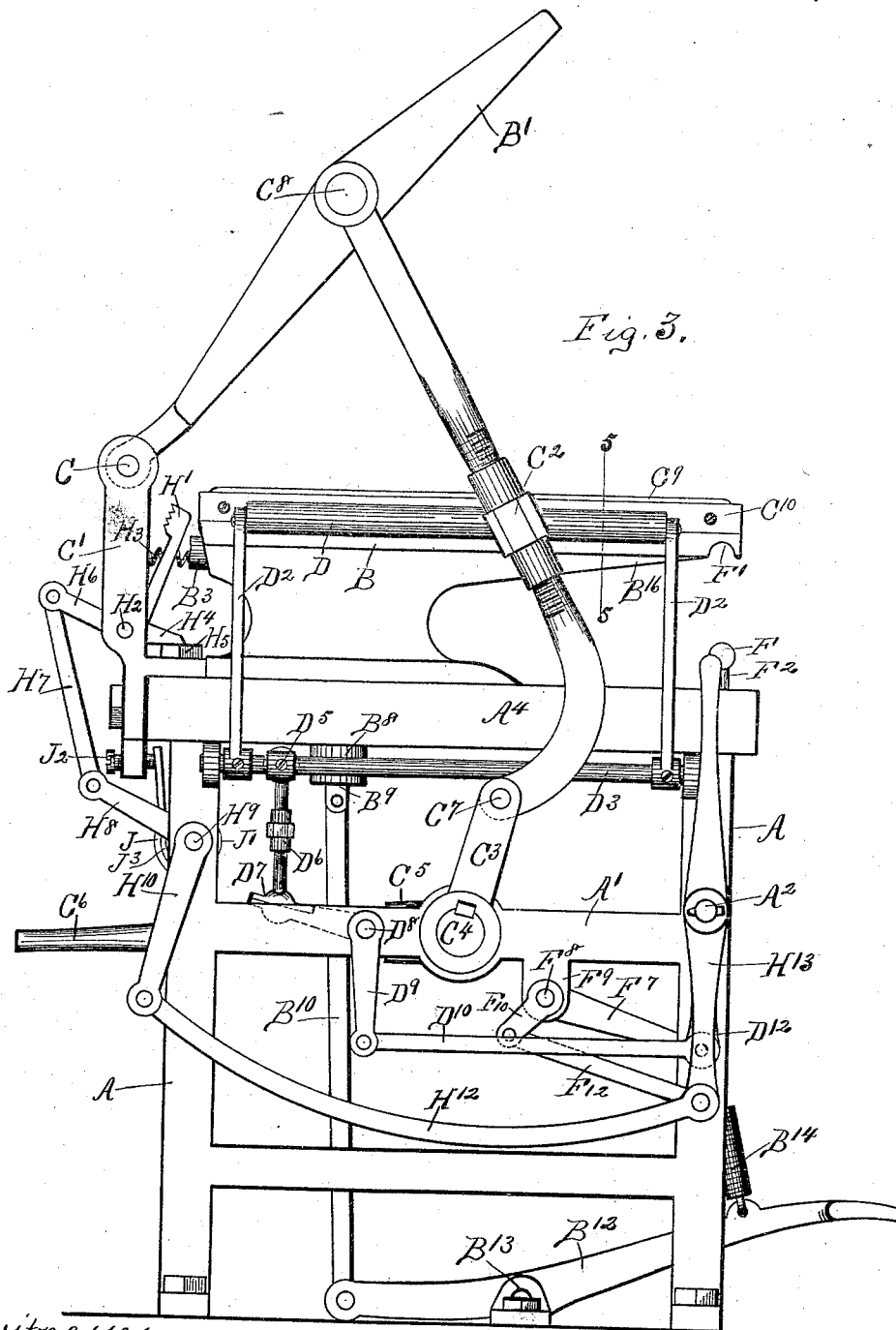
(No Model.)

4 Sheets—Sheet 3.

J. M. BEIERMEISTER. 48  
APPARATUS FOR STARCHING FABRICS.

No. 493,905.

Patented Mar. 21, 1893.



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APPARATUS FOR STARCHING FABRICS.

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Fig. 4.

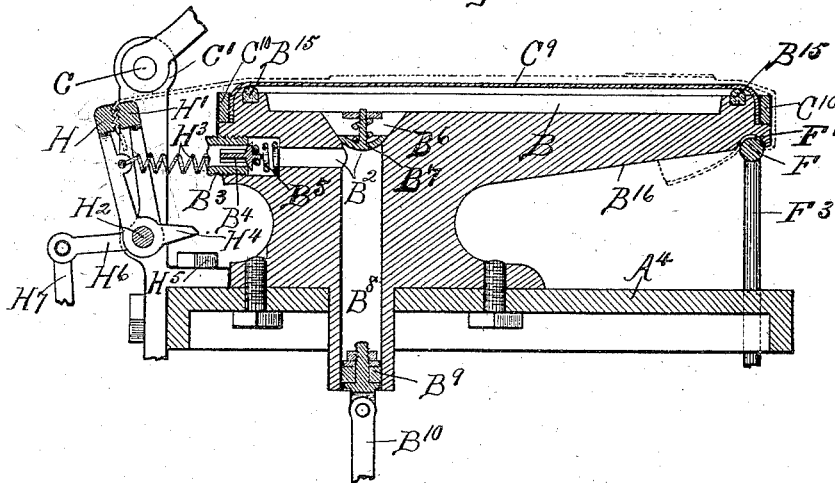
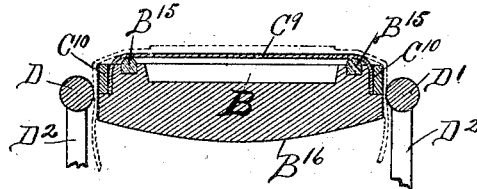


Fig. 5.



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# UNITED STATES PATENT OFFICE.

JOHN M. BEIERMEISTER, OF TROY, NEW YORK, ASSIGNOR OF ONE-HALF TO  
FREDERICK BEIERMEISTER, JR., OF SAME PLACE.

## APPARATUS FOR STARCHING FABRICS.

SPECIFICATION forming part of Letters Patent No. 493,905, dated March 21, 1893.

Application filed May 26, 1892. Serial No. 434,389. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN M. BEIERMEISTER, a citizen of the United States, residing at Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Apparatus for Starching Fabrics, of which the following is a specification.

My invention relates to such improvements and consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a view in front elevation of my improved starching apparatus with the inclosure for the fabric and starch closed or covered. Fig. 2 is a view in elevation of the right-hand side of the apparatus as seen in Fig. 1. Fig. 3 is a view in elevation of the left-hand side of same with the cover of the inclosure raised to permit the insertion or removal of the fabric. Fig. 4 is a vertical central longitudinal section taken on the broken line, 4—4, in Fig. 1, of a portion of the apparatus, the cover, operating levers and supporting frame not being shown. Fig. 5 is a vertical cross-section of the inclosure, taken on the broken line, 5—5, in Fig. 3.

A— is the main supporting frame, and B— the starch basin which together with its cover B'—, forms the inclosure for containing the fabric and liquid starch. The basin is provided in its bottom wall with an inlet duct, B<sup>2</sup>—, leading from a supply-reservoir, not shown. The outer end of the duct is provided with a screw-threaded nipple, B<sup>3</sup>—, by means of which connection can be made with the supply-reservoir. The duct is also provided with a check-valve, B<sup>4</sup>—, controlled by spring, B<sup>5</sup>—. The inner end of the duct connects with a well, B<sup>6</sup>—, in the bottom of the basin containing a spring-controlled check-valve, B<sup>7</sup>—. The well is extended downwardly through the bottom of the basin to form a cylindrical aperture, B<sup>8</sup>—, for the pump-piston, B<sup>9</sup>—, by which the liquid starch can be drawn from the supply reservoir and

forced into the basin. The piston is connected by link, B<sup>10</sup>—, with the treadle, B<sup>12</sup>—, pivoted upon the floor at B<sup>13</sup>—, and provided with a retracting spring, B<sup>14</sup>—. The peripheral edges of the basin are provided with a rubber or other yielding packing or seat, B<sup>15</sup>—, for the cover, when closed as shown in Figs. 1 and 2. The cover is hinged at C—, upon brackets, C'—, bolted to the main frame one on each side, and is connected by the adjustable link, C<sup>2</sup>—, with the arm, C<sup>3</sup>—, of rock-shaft, C<sup>4</sup>—. The rock-shaft is provided with a socket-arm, C<sup>5</sup>—, adapted to receive a detachable hand-lever, C<sup>6</sup>—, for opening and closing the cover. The pivotal connections C<sup>7</sup>—, of the link and lever are so located relatively to the rock-shaft and pivotal connections, C<sup>8</sup>—, of the links and cover that the connections, C<sup>7</sup>—, just pass the vertical plane, produced, which connects the axial lines of the rock-shaft and pivotal connections, C<sup>8</sup>—, when the cover is closed, as shown in Fig. 2, thereby locking the cover in a closed position against any force tending to open the cover unless applied through the rock-shaft as above explained. A tight inclosure is thus formed which can be charged with the liquid starch to the required pressure by means of the force pump operated by the treadle. A chamber or receptacle for the fabric is formed in the upper part of the inclosure by covering the mouth of the starch basin with a porous flexible diaphragm, C<sup>9</sup>—, which may be a piece of fabric stretched over the yielding seat, B<sup>15</sup>—, and secured in place by the binding cleats, C<sup>10</sup>—, which clamp the edges of the diaphragm between the cleats and the edges of the basin, as shown in Figs. 4 and 5. The diaphragm serves to support the fabric over the starch in the starch basin and to prevent the adhering of too much starch to the surface of the fabric to be starched.

To apply starch to the fabric it is only necessary to raise the cover, as shown in Fig. 3, spread the fabric upon the supporting diaphragm, close the cover and operate the treadle until the inclosure is charged to the required pressure. The air in the pores of the fabric to be starched and contained between the fabric and cover is compressed sufficiently by the internal pressure to permit

the starch to be driven through the porous diaphragm and into or through the pores of the fabric to be starched. I am thus able to apply the starch with almost absolute uniformity to every part of the fabric without strain or injury to the fabric, such as is likely to result from the usual methods of rubbing or beating the starch into the fabric. I prefer to give the inner side of the cover which comes in contact with the fabric, a smooth or polished surface, as such a surface prevents the passage through the fabric of more than the requisite amount of starch, and leaves the fabric smooth and free from creases.

The apparatus which I have shown is especially adapted for starching the inserted bosoms of shirts.

The basin with its supporting base is anvil-shaped, and the shirt is drawn over the horn, B<sup>16</sup>—, with the bosom above the supporting diaphragm and the back below the horn, as indicated in part by dotted lines, in Fig. 4. When the cover is closed those parts of the shirt which project over the edges of the basin are forced into the yielding seats sufficiently to maintain a tight joint between the cover and such projecting portions of the shirt. I prefer to provide means for smoothing and stretching those portions of the shirt which are contained within the inclosure before the cover is closed, and have shown three separate kinds of clamps for that purpose.

The side clamps, D, D', are rollers pivoted to rotate in the upper ends of the rock-levers, D<sup>2</sup>—, fixed upon rock-shafts, D<sup>3</sup>, D<sup>4</sup>—, one on each side of the machine. These rock-shafts are each provided with an inwardly projecting rock-lever D<sup>5</sup>—, which levers are connected by links, D<sup>6</sup>—, with rock-levers, D<sup>7</sup>—, fixed upon the rock-shaft, D<sup>8</sup>—, journaled in the oppositely located side-bars, A'—, of the frame. The rock-shaft, D<sup>8</sup>—, is provided with a rock-lever, D<sup>9</sup>—, connected by link, D<sup>10</sup>— with the hand-lever, D<sup>12</sup>—, pivoted upon the stud, A<sup>2</sup>—, projecting from the base-plate, A<sup>3</sup>—, bolted to one of the frame uprights. The roller-clamps are open in the position shown in Fig. 1, when the shirt is slipped over the basin-horn, and after the shirt is so placed in approximately the desired position the clamps are closed by means of the hand-lever, D<sup>12</sup>—, to grip the shirt between the clamps and the sides of the basin. The sides of the shirt are then pulled down from below the clamps until the bosom is stretched sufficiently laterally, in which position it is held by the roller clamps. The sleeve of the hand-lever which incloses the stud, A<sup>2</sup>—, fits the same closely so that the friction between the sleeve and stud maintains sufficient pressure in such clamps. The front end clamp, F, is a horizontal bar or rod extending transversely of the front end of the basin-horn, and is adapted to press the underlying front end of the shirt up into the groove, F'—, on the lower side of the horn to clamp the same. The front

end clamp is supported by two upright slide-rods, F<sup>2</sup>, and F<sup>3</sup>—, movable vertically in slide-ways in the front end of the top, A<sup>4</sup>—, of the frame. The slide-rods are connected and supported at their lower ends by the block, F<sup>4</sup>—, having a pair of ears, F<sup>5</sup>—, to which is pivoted one end of the link, F<sup>6</sup>—, the other end of such link being pivoted to the rock-lever, F<sup>7</sup>—, fixed upon the rock-shaft, F<sup>8</sup>—, which shaft is supported in bearings in the hangers, F<sup>9</sup>—, depending from the side-bars, A'—. The rock-shaft, F<sup>8</sup>—, is provided with a rock-lever, F<sup>10</sup>—, connected by link, F<sup>12</sup>—, with the hand-lever, F<sup>13</sup>—, pivoted upon the stud, A<sup>2</sup>—. By means of this hand-lever the front end clamp can be moved up and down to engage and disengage with the front part of the underlying portion of the shirt to hold the same in position. The jaw-clamp is located just back of the basin and comprises two toothed jaws, H, H'—, pivoted upon a cross-rod, H<sup>2</sup>—, supported by the brackets, C'. The jaw, H—, is connected by spring, H<sup>3</sup>—, with the basin wall. The resilient force of the spring tends to draw the jaw toward the basin. The jaw is also provided with a stop H<sup>4</sup>—, adapted to engage with the bolt-head, H<sup>5</sup>—, and limit the movement of the jaw, induced by the spring. The jaw, H'—, is located to engage with the other jaw and is provided with a bell-crank arm, H<sup>6</sup>—, which is connected by link, H<sup>7</sup>—, with rock-lever H<sup>8</sup>—, secured to the rock-shaft, H<sup>9</sup>—, which has its bearings in the rear uprights of the frame and is provided with a lever-arm, H<sup>10</sup>—, connected by link, H<sup>12</sup>—, with the hand-lever, H<sup>13</sup>—, pivoted upon the stud, A<sup>2</sup>—. The flap of the shirt slipped over the horn of the basin is placed between the jaws of the clamps, and the handle of lever, H<sup>13</sup>—, pushed backward until the flap is tightly clamped between the jaws. Both jaws then move backward, sufficient force being applied to overcome the resistance of the spring and stretch the front and bosom of the shirt, the neck-portion being held by the clamp, F. The jaw-clamps are thus moved from the position shown in Figs. 2 and 3, to that shown in Fig. 4.

The parts are held in the position shown in Fig. 4 by means of the spring-brake, J—, fixed or pivoted upon the inner side of one of the frame uprights in a position to engage with a friction-wheel, J'—, fixed upon the rock-shaft, H<sup>9</sup>. The tension of the brake may be adjusted by means of adjusting screw, J<sup>2</sup>, in bracket, C'—, adapted to engage with the spring-end of the brake, as shown in Figs. 2 and 3. When desired a shoe, J<sup>3</sup>—, may be interposed between the spring and friction-wheel.

By means of the various clamps and connections shown the operating levers can be located in a convenient position and in close proximity to each other, whereby I am able to easily and quickly prepare a shirt for receiving starch, by my improved apparatus without being creased or wrinkled.

The fabric comes from my improved apparatus in a condition ready for the ironing machine, as soon as sufficiently dry.

I do not wish to be limited to any specific form of clamp for holding or stretching the fabric to be starched. Small articles such as collars and cuffs, that can be wholly contained within the inclosure, do not require exterior mechanism for holding or stretching them, as they can be sufficiently smoothed by hand when placed in the starch-basin. The porous diaphragm affords a sufficient support to hold the fabric against the cover when the latter is closed.

I have shown a preferred means for charging the inclosure with liquid starch, but any known mechanism for charging inclosures with liquids may be employed to subject the inclosed liquid starch to pressure.

I am able with my improved apparatus to pump cold jellified starch from a supply-reservoir into the starch basin and force the same into the fabric to be starched, and I wish to be understood as including by the expression liquid starch any form of starch adapted to be applied to fabric, whether the starch be in a heated, easily-flowing fluid form, or cold and in the form of a jelly.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus for starching fabrics, the combination with a closed vessel having an inner smooth surface; of a removable cover; a support within the inclosure for holding the fabric against the smooth surface; and mechanism for charging the inclosure with liquid starch, substantially as described.

2. In an apparatus for starching fabric, the combination with a starch basin; and a removable cover having a smooth inner surface; of a yielding fabric-support between the peripheral edge of the basin and the cover; and mechanism for charging the basin with liquid starch, substantially as described.

3. In an apparatus for starching fabric, the combination with a starch basin; of a removable cover having a smooth inner surface; a support within the basin for holding the fabric against the cover; and mechanism for charging the basin with liquid starch, substantially as described.

4. In an apparatus for starching fabric, the combination with a starch basin having a removable cover; of a cover-seat between the peripheral edge of the basin and the cover; a porous, flexible diaphragm across the mouth of the basin with its edges between the cover-seat and cover; and mechanism for charging the basin with liquid starch, substantially as described.

5. In an apparatus for starching fabric, the combination with a starch basin having a removable cover, of a yielding seat between the peripheral edge of the basin and the cover; clamps for holding the fabric stretched across the mouth of the basin; and mechanism for charging the covered basin with liquid starch, substantially as described.

In testimony whereof I have hereunto set my hand this 14th day of May, 1892.

JOHN M. BEIERMEISTER.

Witnesses:

GEO. A. MOSHER,  
FRANK C. CURTIS.