(No Model.)

E. T. NOWLEN.

APPARATUS FOR RENOVATING PILE FABRICS.

No. 562,908. Patented June 30, 1896.

Fig. 1.

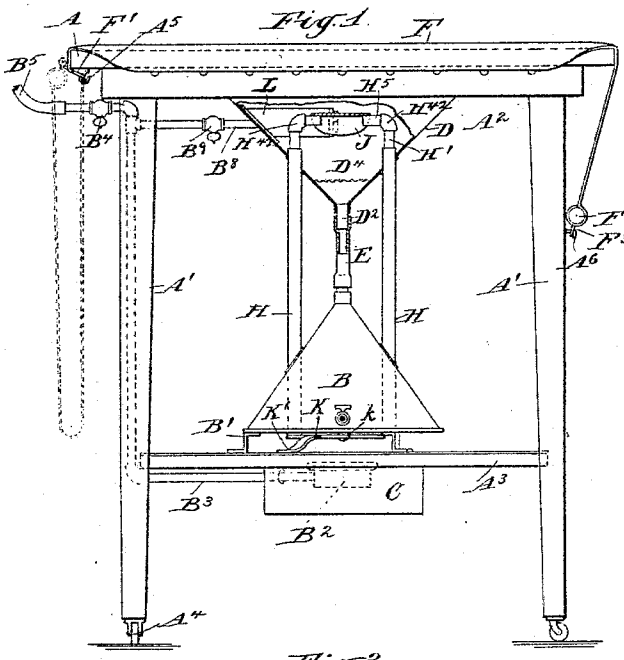


Fig. 2.

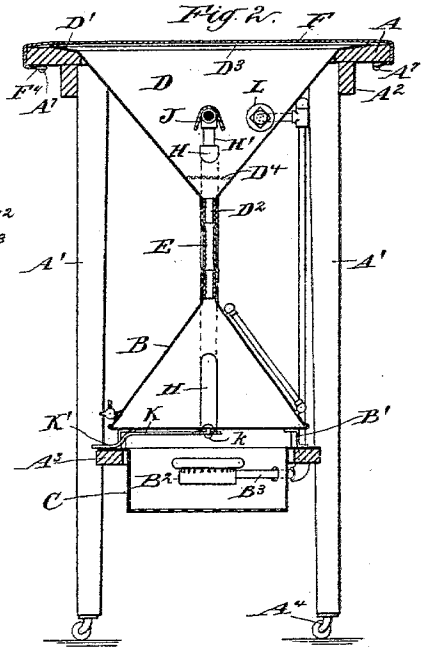


Fig. 3.

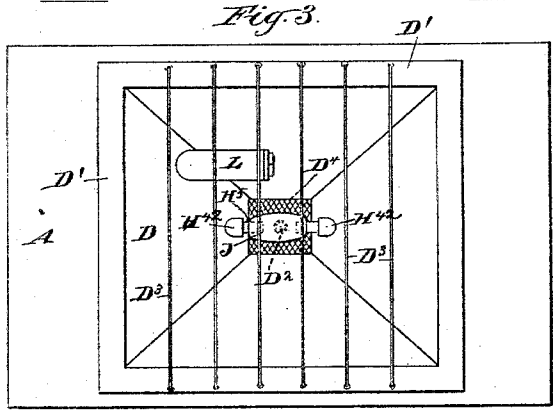


Fig. 4.

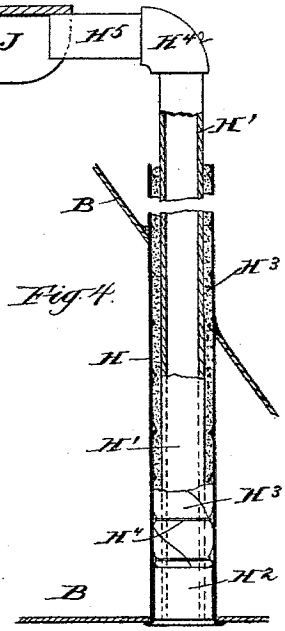


Fig. 5.

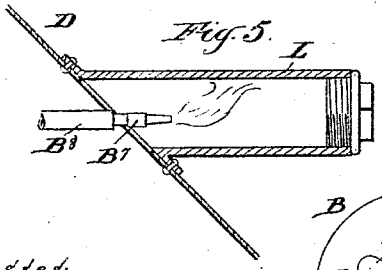
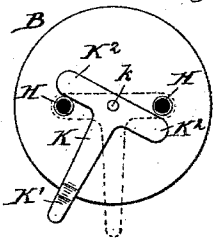


Fig. 6.



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APPARATUS FOR RENOVATING PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 562,908, dated June 30, 1896.

Application filed November 5, 1895. Serial No. 568,048. (No model.)

To all whom it may concern:

Be it known that I, EDWARD THOMAS NOWLEN, a citizen of the United States, residing at Blythebourne, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Apparatus for Renovating Pile Fabrics, of which the following is a specification.

There have been many attempts, more or less successful, to supply an apparatus by which velvets, plushes, velours, and like fabrics may be treated by passing steam through them to raise the pile when it has become crushed or matted from folding or wetting. In all the forms before known to me there has existed a liability to wet the goods during treatment by reason of the steam being too damp and condensing on the fabric or by drops of water mechanically suspended in the steam, carried along thereby, and deposited upon the goods, in either case causing the pile to fall and necessitating a thorough drying before continuing the treatment. It is usual also to hang the fabric in a hot dry place or to pass it over heated surfaces to insure that any moisture absorbed during the treatment shall be evaporated.

The object of my invention is to avoid the danger of wetting and dispense with the subsequent drying. I accomplish these important ends by causing the steam as it flows from the boiler into the steam-chamber and before it passes through the fabric to be thoroughly dried by contact with highly-heated surfaces or by additional heat supplied directly to the steam to insure the complete evaporation of any drops of water held in suspension or otherwise contained.

I have shown the invention applied to an apparatus in the form of a small table, the top of which is cut away in the center, leaving a narrow margin on the ends and sides. In the aperture thus formed is fitted a funnel-shaped steam-chamber extending downward and communicating with a boiler below heated by a gas-jet or other burner. A sheet of coarse fabric is stretched over the table-top and open mouth of the steam-chamber to support the material to be treated. Flues are provided leading from the vicinity of the burner into the steam-chamber and adapted to supply mingled air and products of combustion at high temperature to the steam passing from the boiler to the chamber, to slightly superheat it and evaporate any moisture therein before it passes through the sheet and acts on the fabric to be treated lying thereon. Means are also provided for regulating the supply of heat, and an auxiliary heating means is shown in which a surface within the steam-chamber is raised to a high temperature by a gas-jet or other source of heat located without.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a side elevation, partly in vertical section. Fig. 2 is a corresponding transverse vertical section. Fig. 3 is a plan view with certain parts removed. Figs. 4 and 5 are vertical sections showing portions on a larger scale. Fig. 6 is a plan of the boiler-bottom seen from below.

Similar letters of reference indicate the same parts in all the figures.

A is the table-top, rectangular in outline, supported on legs A′, braced by the frame A^2, and carrying a platform A^3 below, all of suitable strong wood and mounted for convenience on casters A^4. On the platform A^3 is set a conical boiler B of galvanized sheet-iron, supported on legs B′, riveted to the bottom of the boiler and fastened to the upper surface of the platform at equally-spaced points about a circular opening therein directly below the boiler. Within this opening is set a Bunsen or other burner B^2, adapted to supply the heat required to generate steam in the boiler, which burner is surrounded by a casing C of galvanized iron, and the upper surface of the platform is protected by a covering of tin as safeguards against fire. The bottom of the casing is perforated, as shown, to allow free circulation of air to the burner.

The gas-supply pipe B^3 extends outwardly from the burner to one of the legs A′ and is secured thereto and led upward, ending in an outward extension controlled by the cock B^4, to which is attached one end of a flexible rubber tube B^5, bringing gas from any conveniently-situated fixture.

At the apex of the conical boiler is secured a nipple or short length of pipe set vertically and joined by a flexible connection E to a corresponding nipple D^2, set in the downwardly-projecting apex of the funnel-shaped steam-chamber D in the form of an inverted pyramid of galvanized sheet-iron, matching to the rectangular opening cut in the table-top A and occupying nearly the whole of its area. A flange D′ extends outwardly from the upper edge of the chamber on all sides and lies on the table-top adjacent to the opening and supports the steam-chamber.

F is a sheet of strong coarsely-woven muslin strongly bound or hemmed at the edges and longer and wider than the table-top and provided at one end with a series of rings F′, matching to hooks A^5 on the under face of the latter near the edge, and at the other end with a cross-piece F^2 of wood, to which it is secured. The cross-piece carries eyes F^3, which when the sheet is stretched longitudinally are engaged over hooks A^6, set at the proper height on the legs A′. The sheet is strained transversely by engaging the rings F^4, secured along the sides over the projecting heads of tacks A^7, driven into the under face of the table-top at proper intervals. Several cross-wires D^3, soldered at the ends to the flanges D′, extend across the open mouth of the chamber and serve to prevent the sagging down of the central portions of the sheet and preserve a practically level surface upon which to spread the goods to be treated and support them during the steaming operation, so that they may be brushed, as usual, to aid in raising the pile.

H H are pipes of galvanized sheet-iron set in the bottom of the boiler B and extending vertically upward through the latter and a short distance into the steam-chamber D. Each incloses an iron flue H′, having at its lower end an ordinary coupling H^2, matching to the interior of the pipe and forming an offset or space between the latter and the flue H′, which space is filled with asbestos fabric H^3, wound spirally upon the flue and secured in place by bands H^4 of fine wire.

The asbestos covering extends the full length of the pipe H and serves to prevent melting the solder at the junction with the walls of the boiler and chamber by conduction through the metal. The flues H′ extend a little above the pipes H and end in elbows H^{12}, carrying each an open nipple H^5, set facing toward the center of the chamber and discharging directly into the current of steam ascending from the nipple D^2. Hot products of combustion mingled with air drawn in at the burner B^2 are carried upward in the flues and delivered to the steam-chamber D, raising its temperature and effectually drying the steam and evaporating any particles of water carried along in suspension and not arrested by the wire-netting D^4, set horizontally across the chamber just above the nipple D^2 to prevent the stoppage of the latter by small articles accidentally dropped into the open mouth of the chamber.

To avoid damaging the goods by excessive heat passing upward from the flues, I provide a shield J of asbestos fabric folded upon itself and hung by the fold so formed upon the nipples H^5 and extending downward a little distance on each side, serving to deflect the currents of hot air and insuring that they shall be broken up and diffused and not be projected directly against the under face of the sheet F.

The supply of heat may be regulated by the T-shaped lever K, mounted with liberty to turn horizontally on a pivot *k*, secured at the center of the under face of the boiler B. It has two arms K^2 K^2 of sufficient length and width to reach and cover the flue-openings when the lever K is swung to the proper position. The end of the lever is bent downward and outward, as at K′, to engage frictionally with the upper surface of the platform A^3 and thus hold the arms in any desired position with more or less of the flue-openings exposed.

L is a short length of iron pipe of large diameter, flanged as shown and riveted to the end wall of the chamber D, extending horizontally into the latter. It is closed at the inner end and receives at the open end a jet-burner B^7 on an arm B^8 from the gas-pipe B^3, controlled by the cock B^9 and projecting its flame within the pipe L. When this burner is lighted, the heat therefrom soon raises the temperature of the pipe and is radiated by the latter within the chamber, serving as an auxiliary means for drying the steam therein.

In starting the steaming operation water is supplied by pouring from any suitable vessel into the funnel-shaped chamber D, from which it flows downward through the connection E into the boiler B. The lever K is turned to close the flue-openings, and gas being supplied the burner B^2 is lighted. As soon as steam begins to be generated in any considerable quantities the lever K is thrown back and the hot air and products of combustion are allowed to ascend into the chamber and mingle with the steam entering from the nipple D^2.

By my invention the apparatus is ready for use almost immediately without waiting for the sheet to become dry.

All danger of wetting the goods is practically avoided, as is the necessity for subsequent drying. The goods are quite dry and hot on leaving the table.

Modifications may be made without departing from the principle of the invention or sacrificing its advantages.

Other means than the T-lever K K^2 may be employed to control the flow of hot air to the chamber. A greater number of flues H′ may be used or one alone may serve. I can add to the number of pipes L used as auxil-

iary heaters or may dispense with such altogether, or may, if preferred for any reason, use them instead of the flues.

I claim—

1. In an apparatus for renovating pile fabrics, a steam-chamber having an opening for allowing steam to pass into the fabric to be treated, a boiler supplying steam to the chamber and a burner below the boiler, in combination with flues extending from the vicinity of the burner into said chamber, for supplying additional heat to the latter from the burner to dry the steam before its passage to the fabric, all substantially as herein specified.

2. In an apparatus for renovating pile fabrics, a steam-chamber having an open top for allowing steam to pass into the fabric laid thereover, a boiler below the chamber and connected thereto and a burner under the boiler to heat the latter, in combination with the flues H′ arranged to receive heated air and hot products of combustion from the burner and extending into said chamber, elbows H^4 and nipples H^5 at the upper ends of said flues, for projecting the heated currents transversely of the ascending current of steam to dry the latter on its passage to the fabric to be treated, all substantially as herein specified.

3. In an apparatus for renovating pile fabrics, a steam-chamber having an open top for allowing steam to pass through the fabric laid thereover, a boiler located below the chamber and connected thereto and a burner under the boiler to heat the latter, in combination with flues set in the boiler-bottom and extending therethrough into the said chamber to supply heated air and hot products of combustion to the chamber to dry the steam therein, and the lever K, K^2 pivoted to the boiler-bottom, for controlling the supply of heat to the flues by covering or exposing their open lower ends, all substantially as herein specified.

4. The steam-chamber D, boiler B below the chamber and connected thereto, and the burner B^2 under the boiler, in combination with the flues H′ set in the bottom of the boiler and extending upward through the latter into the steam-chamber, pipes H inclosing the flues, and the non-conducting filling H^3 between said flues and pipes, all substantially as and for the purposes herein specified.

5. The steam-chamber D, boiler B and burner B^2, in combination with the flues H′ extending from the burner to and within the said chamber, elbows H^4 and nipples H^5 forming the ends of the flues, and the shield J of non-conducting material between the flue-openings and the fabric to be treated, all substantially as and for the purposes herein specified.

6. The steam-chamber D, boiler B located below the chamber and connected thereto, in combination with means for supplying additional heat to the chamber to dry the steam therein and the netting D^4 arranged in the path of the incoming steam to arrest drops of water carried mechanically in suspension and also to prevent accidental stoppage of the steam-passage, all substantially as herein specified.

7. In an apparatus for renovating pile fabrics, a steam-chamber having an opening for allowing steam to pass into the fabric to be treated, a boiler supplying steam to the chamber and a burner below the boiler, in combination with flues extending from the vicinity of the burner into said chamber to supply additional heat to the steam therein, and the pipe L extending into the chamber and having the burner B^7 therein, to serve as an auxiliary heating means, all substantially as herein specified.

8. In an apparatus for renovating pile fabrics, a steam-chamber having an opening for allowing steam to pass into the fabric, a boiler supplying steam to the chamber, and a burner below the boiler, in combination with the pipe L extending into the chamber and having the burner B^7 therein for supplying additional heat to the steam on its passage to the fabric, all substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

EDWARD THOS. NOWLEN.

Witnesses:

JAMES J. NOWLEN,

GEO. J. O'KEEFE.