

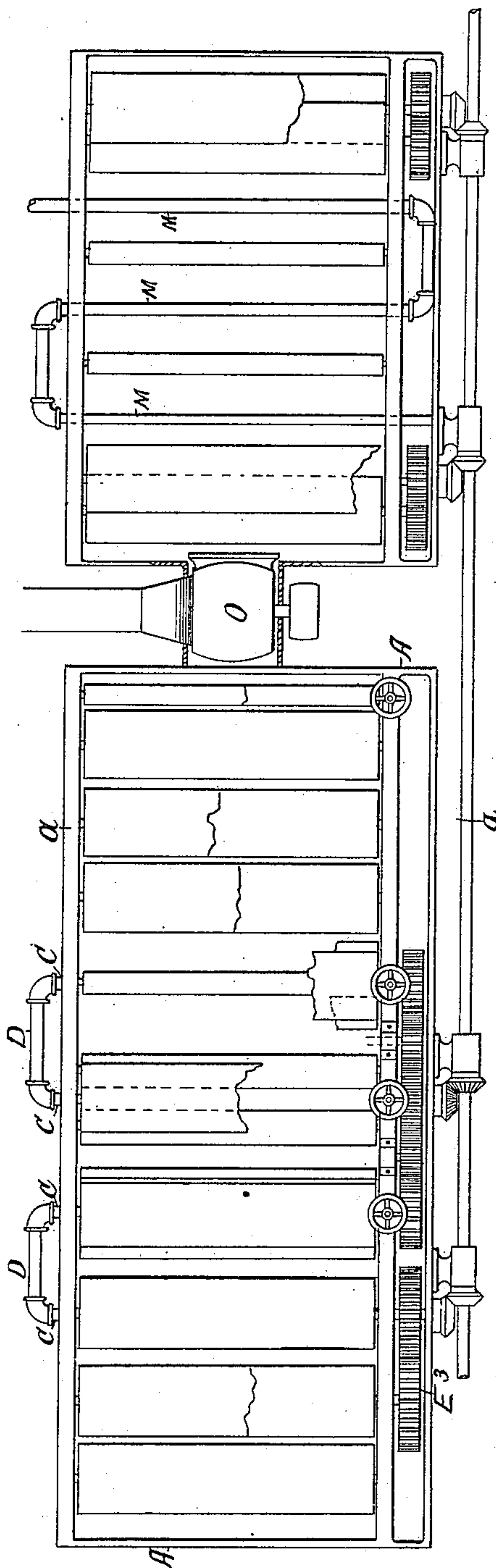
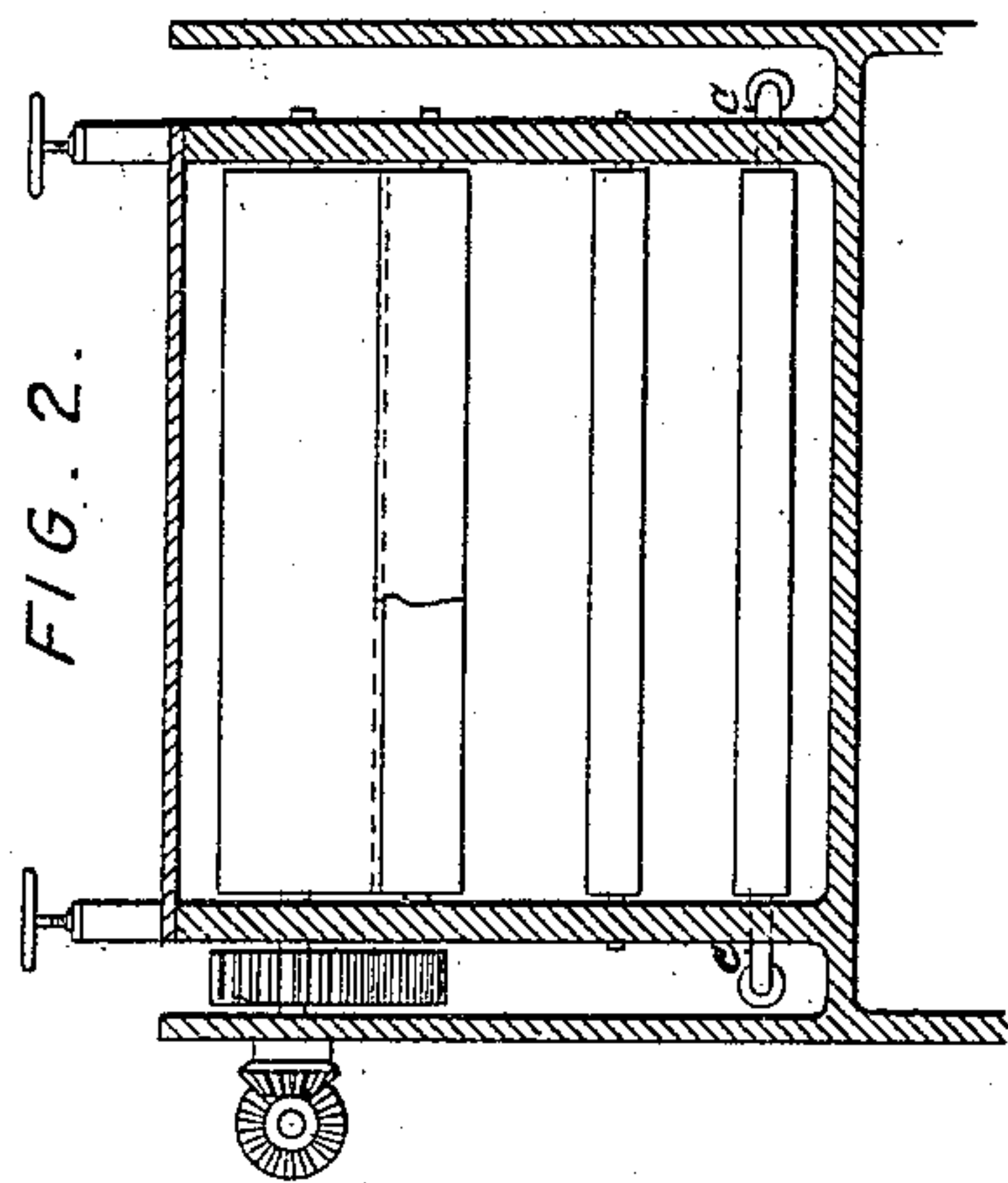
(No Model.)

2 Sheets—Sheet 1.

G. W. BEACH & M. P. WOOD.

Apparatus for Treating Textile Fabrics in Vats.
No. 241,118. Patented May 10, 1881.

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WITNESSES.

Wm H. Brewster
J. W. Hamilton Johnson

INVENTOR.

George W. Beach
Matthew P. Wood
By Boyd Elliott atty

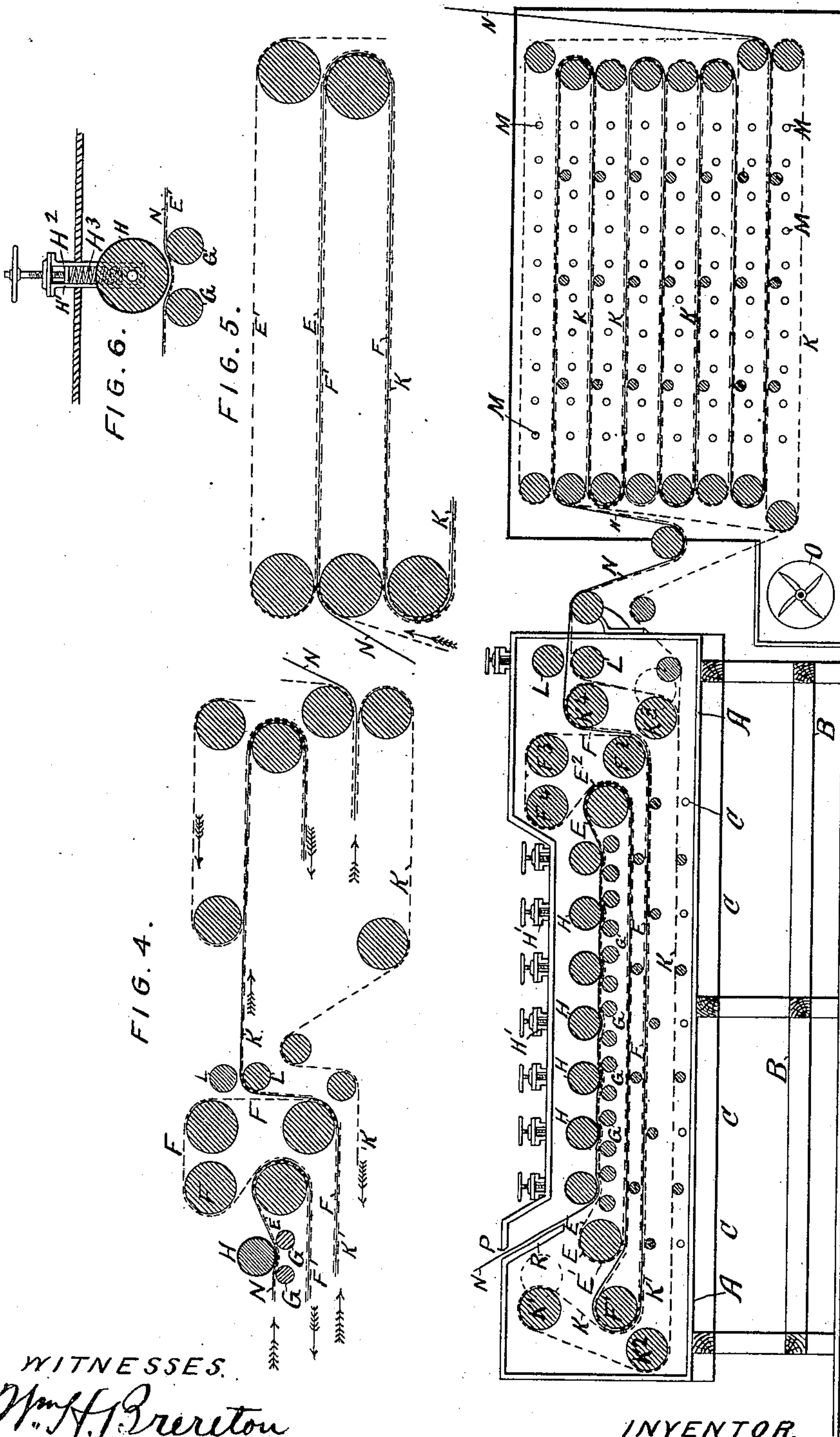
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UNITED STATES PATENT OFFICE.

GEORGE W. BEACH AND MATTHEW P. WOOD, OF NEW YORK, N. Y., ASSIGN-
ORS OF ONE-THIRD TO FISHER MORRIS CLARKE, OF SAME PLACE.

APPARATUS FOR TREATING TEXTILE FABRICS IN VATS.

SPECIFICATION forming part of Letters Patent No. 241,118, dated May 10, 1881.

Application filed February 24, 1881. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. BEACH and MATTHEW P. WOOD, both of the city, county, and State of New York, have jointly invented
5 a new and useful improvement in an apparatus for treating textile fabrics with various materials in solution, as dyes, water-repellents, filling and finishing substances, &c., of which the following is a specification.

10 Among the chief difficulties in treating large quantities of woven or felted or other textile fabrics with dyes or waterproofing or repellent substances are, first, the complete and even distribution of the solutions or substances held in
15 suspension throughout the fabrics to be treated; and, second, keeping the said solutions in the fabrics during the process of drying from running to and fro, according to the position the fabric may be carried in the process of drying, and often producing thick and thin spots
20 and often unsightly differences of color over the surface of the treated fabric. This is peculiarly the case when heavy solutions—as dissolved paraffine, as for waterproofing and filling woven fabrics—are employed.

25 To overcome these difficulties and at the same time furnish means for treating immense quantities of material, or for making the operation continuous and automatic, are the objects of
30 this invention; and it consists, chiefly, in the combination of two or more wire-cloth or perforated sheet-metal belts arranged to move in a tank for holding the solution, and supported between pressing and carrying rolls in such a
35 manner that a web of woven or other textile fabric may be introduced over and between said belts at one end of the tank, and carried down into the solution and conveyed along while submerged, and subjected to alternate pressures
40 from rolls and releases, and then conducted out of the solution to a drying apparatus, as will hereinafter appear.

45 In the drawings, Figure 1, Sheet 1, is a plan of the entire apparatus. Fig. 2, same sheet, is a transverse section of the tank at *a a*. Fig. 3, Sheet 2, is a longitudinal and vertical section of the entire apparatus. Figs. 4, 5, and 6, same sheet, are detail views that will be referred to in the description.

50 At A is represented a tank, of any suitable

size, and shape, and material to hold the solution or substances with which the fabric is to be treated. In the drawings it is shown as a long rectangular box supported on frame-work, as at B; but it may be of metal and mounted
55 over a furnace, to keep the solutions at the required temperature. The required degree of heat may, however, be maintained by heating-pipes placed in the bottom of the tank, as shown at C, the return-bends or outside connections
60 of which are shown at D, Fig. 1. In said tank are mounted the perforated carrying-belts, as at E F, which are of wire-cloth or perforated sheet metal, and which are so mounted as to
65 co-operate together in pairs for the purpose of carrying and supporting the fabric to be treated between them, so that it will not be subjected to any tension or stretching action of any kind whatever, or even from its own weight
70 in the solution or in being drawn therefrom. The first of the belts, as at E, is supported in a horizontal position upon a roll at each end, as at E' and E², one of which is driven by suitable gearing on the outside, as E³, Fig. 1, and
75 there are supporting-rolls underneath the upper portion of the belt, as at G, to sustain it under its own weight and under the pressure of the compression-rolls, as at H, which are supported in suitable guides, H', with springs and
80 regulating-screws, as at H² and H³, (shown enlarged at Fig. 6 of Sheet 2,) all arranged as in the well-known form of calendering-machines. The lower horizontal portion of the said belt E
85 is supported upon the upper horizontal portion of the second belt, F, and which is longer than the first and is carried partially around the delivering end of the first belt, so that the fabric is there caught between the two belts and returned back through the solution, and may
90 again be caught by a third belt, as shown at K, which will carry it back between the under portion of the belt F and the upper portion of the belt K, and thence out of the tank, or may
95 be again returned by as many belts as are required to complete the operation. These belts F and K are carried over rolls, as at F', F², and F³, at one end, to properly guide it around the end of the first belt, E, and the other end is carried around a roll at F⁴, which may be its
100 driving-roll, to draw it along with the under

side of the first belt; or all the rolls may be geared together, so that all portions of the belts will be moved without much tension on them. So, also, the belt K is carried on similar rolls, 5 K', K², and K³, and if it is used as the delivering-belt, it may be carried up at one end of the tank above the liquid and passed through a pair of compression-rolls, as at L, to squeeze the surplus liquid from the fabric, and then it 10 passes on through a system of heating-pipes, as represented at M, where it supports and carries the fabric back and forth until the drying operation is sufficiently performed, if not completed, to fix the substances of the solution or 15 materials desired to be imparted to the fabric, and then the belt returns to the tank, as represented in the diagram at Fig. 4, Sheet 2, and where the arrows indicate the course of the belts, as also the fabric.

20 At Fig. 5 is shown an enlarged form of the combined carrying and supporting action of the belts; but in each of the views the fabric is represented by the solid lines, as at N, and the belts by the broken lines.

25 The drying apparatus may be of any convenient form and size to accomplish the purpose, and may be a system of steam or hot-air pipes, or it may be merely a chamber through which currents of dry air are produced, as by a fan, 30 which is represented at O, in one portion of a chamber, and the vapors may be driven off through a flue or funnel or ventilators at the top.

If the tank A is covered, as represented, the 35 fabric may be introduced through an opening, as at P, down an inclined chute at R to the upper surface of the first belt at E, where it will be only slightly submerged in the liquid, but will be subjected to alternate compressions 40 and releases as it passes beneath the rolls H, and then from them to the next set, and so on to the last, where it is conducted between the belts E and F and carried down to a greater depth in the liquid, and where, of course, the 45 liquid pressure is greater, and where it is carried back and forth between each succeeding belt until it is thoroughly saturated.

Some kinds of fabric may require only one or two passes through the liquid and but little, 50 if any, pressure, while other kinds—as thick heavy woollens or felted fabrics—may require

many passes and a considerable amount of compressions and releases to expel the air from the fibers and thoroughly impregnate or work the liquid into it. This will be specially the case in 55 treating fabrics with waterproofing or repellent substances, as paraffine, &c., to which this apparatus is specially applicable, as the metal belts will not become clogged or filled up with such gummy or glutinous materials as are often 60 used for such a purpose. Such an arrangement of belts will also be found very useful for cleansing and thoroughly washing fabrics that are very delicate in texture, as silks, &c., and which afterward require to be filled with some 65 substances to give the required body and finish.

It is evident that the form of the tank may be greatly varied, and also that two or more tanks may be arranged end to end, so that the material may pass from one step in the operation 70 to another, as from the cleansing to the filling or partially filling, and thence on to the finishing and calendering, as may be desired, and in some instances a single belt may be used and returned to and fro.

It must also be understood that we make no broad claim to the use of webs or endless belts for carrying the fabric, for this has before been used in dyeing apparatus; but 75

We desire to claim— 80

1. In combination with a tank for holding liquids for treating textile fabrics, two or more perforated metallic belts for supporting and carrying the fabric, as hereinbefore set forth.

2. In an apparatus for treating textile fabrics, as hereinbefore set forth, the combination 85 of a tank for holding liquids, two perforated metallic belts for supporting and carrying the fabric, and a drying apparatus, into and through which one of said belts may run 90 to support the material until it is sufficiently dried to prevent the liquid from changing its position in the fabric, as hereinbefore set forth.

In witness whereof we have hereunto set our seals and subscribed our names in the 95 presence of two subscribing witnesses.

GEO. W. BEACH. [L. S.]
MATTHEW P. WOOD. [L. S.]

Witnesses:

EUGENE N. ELIOT,
E. B. STANTON.