(No Model.) 2 Sheets—Sheet 1.

H. C. SPALDING.

APPARATUS FOR WATERPROOFING FABRICS.

No. 345,002. Patented July 6, 1886.

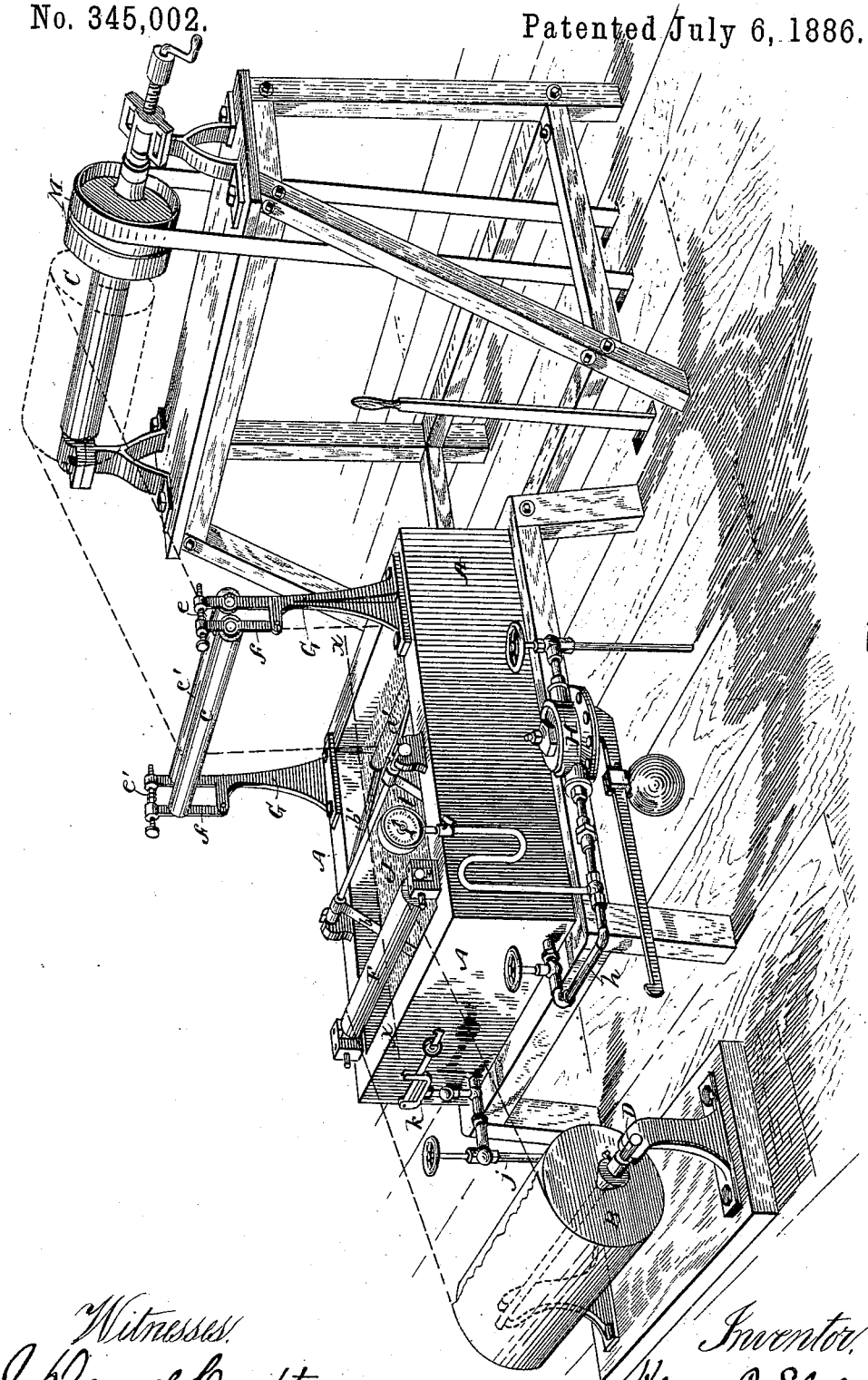

Fig. 1.

Witnesses.
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Raymond L. Barnes

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(No Model.) 2 Sheets—Sheet 2.

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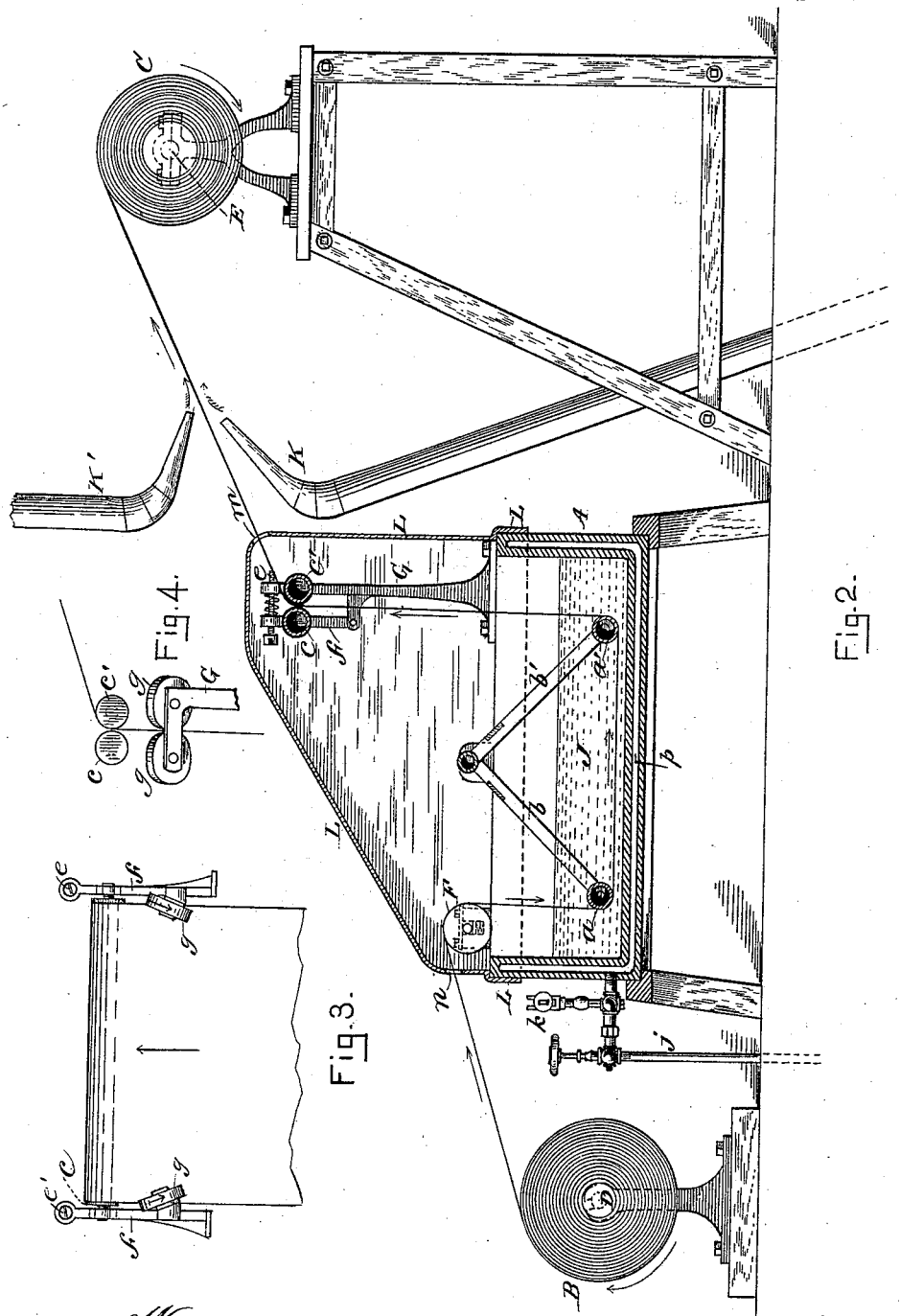

Fig. 2.

Fig. 4.

Fig. 3.

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UNITED STATES PATENT OFFICE.

HENRY C. SPALDING, OF BOSTON, MASSACHUSETTS.

APPARATUS FOR WATERPROOFING FABRICS.

SPECIFICATION forming part of Letters Patent No. 345,002, dated July 6, 1886.

Application filed October 23, 1885. Serial No. 180,778. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. SPALDING, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Waterproofing Fabrics, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

The subject of my present invention is an apparatus for saturating a web of a fabric of any kind with insulating or water-proof compounds, and is capable of a great diversity of uses. For example, it may be employed for saturating cloth of any kind or a web of paper with wax, tallow, or paraffine, or various other compounds. It is, however, more particularly designed for the preparation of paper or like material for use in the manufacture of electric cables, by impregnating and coating the same with spermaceti or paraffine. It is designed with a view to cheapness and simplicity in construction, while at the same time it is capable of preparing the paper more rapidly and with a more even distribution of the insulating material than has heretofore been possible.

In carrying out my invention I employ a tank or receptacle for the material to be applied to the fabric, and with this I use a system of steam-pipes for maintaining the material in a fluid state. The tank is provided with a cover or hood for confining and retaining the heat, and there are various rollers for directing the course of the fabric through the material, for removing the surplus material, and for stretching the fabric transversely. These and other features will be described by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the apparatus complete. Fig. 2 is a vertical longitudinal section on line *x x*. Figs. 3 and 4 are details of devices for stretching the paper transversely.

D is a shaft or roller in suitable bearings, for containing a roll, B, of the fabric or material to be treated. After passing through the apparatus the treated web is wound on a shaft or roller, E, in a roll, C. The shaft E is turned either by hand or by a belt and pulley, M.

Between the two shafts D E is a melting-tank, A, within which the insulating or water-proofing substance is placed. This tank is formed with a steam chamber or jacket, *p*, into which steam is admitted through the pipe *h*, and from which it issues by pipe *j*.

In order to regulate the temperature, I employ any proper form of steam-pressure regulator, H, a well-known form of apparatus, and therefore not described in detail herein. I also use a steam-gage, *l*, for indicating the pressure, and a safety-valve, *k*, as a precaution against too high a pressure.

Over the whole tank is a cover or hood, L, containing slots *m n*, to permit the web to pass in and out. Under this cover are arranged a deflecting-roller, F, two submerging-rollers, *a a'*, carried by the pivoted arms or frames *b b'*, and the two rollers *c c'*, for removing from the web any excess of insulating material. These rollers are carried by standards G G, one having bearings in the stationary parts of said standards, while the other is journaled in the arms *f f*, pivoted to the standards.

The rollers *c c'* are made adjustable by means of the screws *e*, surrounded by spiral springs; and when set close together their action is like that of an ordinary wringer.

To the standards G G are also secured studs, that carry disks *g g*. These latter are set obliquely to the line of movement of the web, and press upon both sides of the same near the edges.

Between the tank and the winding-reel E are one or more blowers, K K', for forcing a blast of cool air upon the web as it issues from the tank-cover through the slot *m*.

The pivoted frame *b b'* and rollers *a a'* carried thereby have a special function in this machine. When the machine is started, the strain is greater on the web of fibrous material than after it is running at its regular speed. When a paper web is used, it would be broken, but for the rollers *a a'*, which swing to one side under the strain and lessen the tension.

The operation of the apparatus is as follows: A roll of fabric—such as Manila paper—is placed on roll D and drawn through the apparatus to reel E, upon which it is to be wound. It first passes over the deflecting-roller F and then under the submerging-rollers *a a'*, by

which means it is carried through the insulating material J. It then passes up to the wringers; but before passing between them it is spread by the action of the diagonal rollers or disks *g*, thus counteracting a tendency in the paper to shrink unevenly after issuing from the bath. Immediately after being stretched transversely by the rollers *g* the paper is rolled smooth by the wringers C C'. The paper is made to run evenly through these rolls by adjusting properly the screws *e e*. The paper is then cooled and wound on the reel E. The cover L retains the heat, so that the fabric on entering the cover becomes heated before it enters the bath, by which it is caused to take up the insulating material better. It is also kept hot after issuing from the bath and until it has been acted upon by the rollers *g g* and *c c'*. Thus the cover serves a highly-important function.

The rollers F, *a a'*, and *c c'* may be made of brass tubing, though the latter may be made of other materials. The tension is easily determined or fixed by the weight of the rollers *a a'* and frames *b b'*, or by frictional appliances, or the pressure of rollers *c c'*, or by all or any of these conjointly.

What I claim as my invention is—

1. The combination of the tank, means for regulating and applying heat thereto, the deflecting-roller F, and the pivoted or swinging rollers *a a'*, all as set forth.

2. The hooded or inclosed tank for containing an insulating material, in combination with means for applying heat thereto, submerged swinging rollers for directing a textile or fibrous web through the insulating material, wringers for removing the surplus material from the web, and reels for holding the web, all as set forth.

3. The melting-tank, in combination with rollers for deflecting a web of paper or like material through the same and rollers set obliquely to the line of movement of the web, for stretching the same transversely after it issues from the tank, as described.

4. The melting-tank, in combination with rollers for deflecting a web of paper or like material through the same, two sets or pairs of rollers set obliquely to the line of movement of the web, for stretching the same transversely after it issues from the tank, and wringers for pressing the web after it passes from the stretching-rollers, all as set forth.

5. The combination of a melting-tank, rollers for directing a web of paper through the same, obliquely-set rollers for stretching the web transversely, pressing-rollers or wringers, and means for directing a current of air upon the web after it leaves the wringers, as described.

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Witnesses:
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