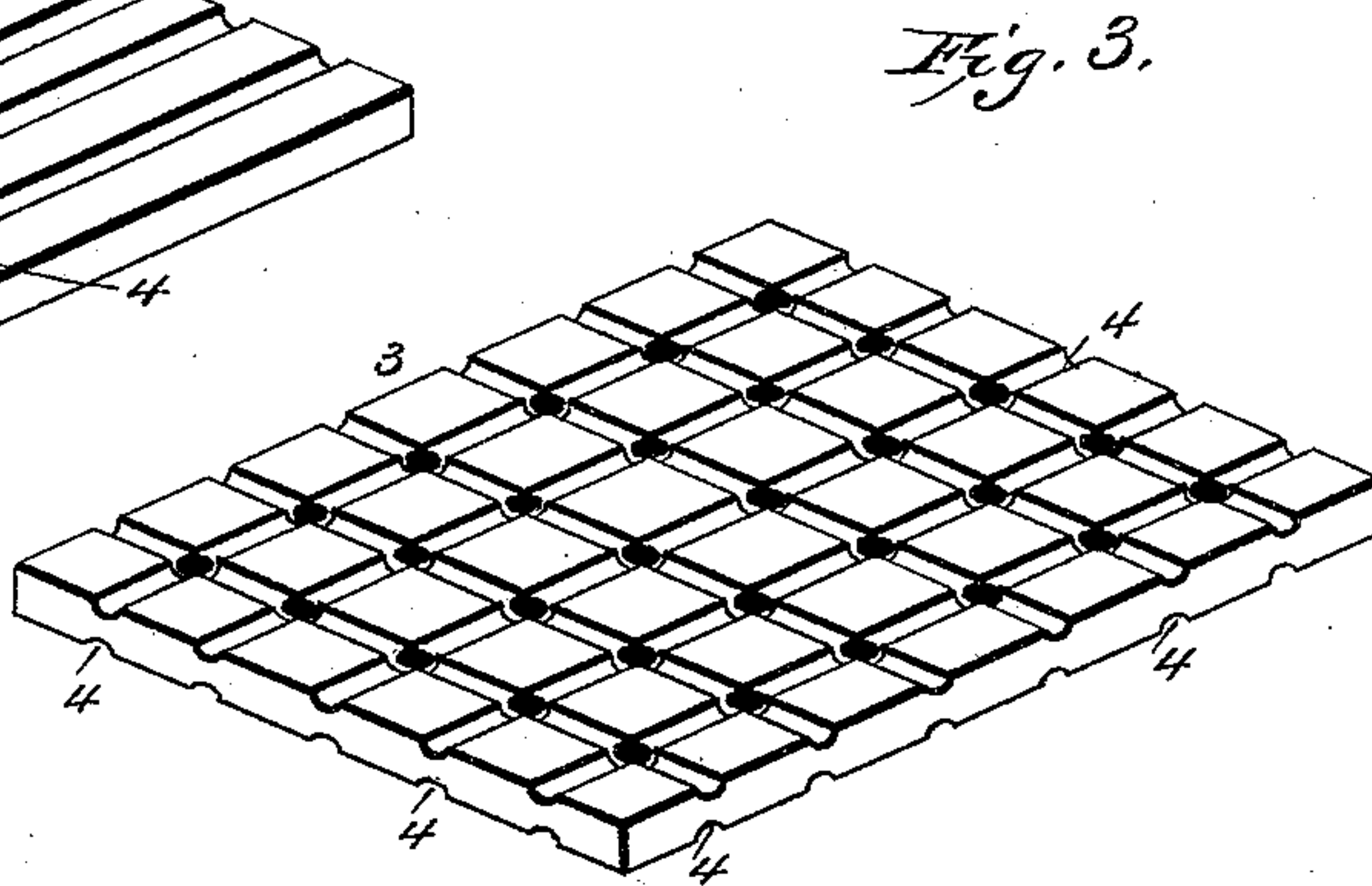
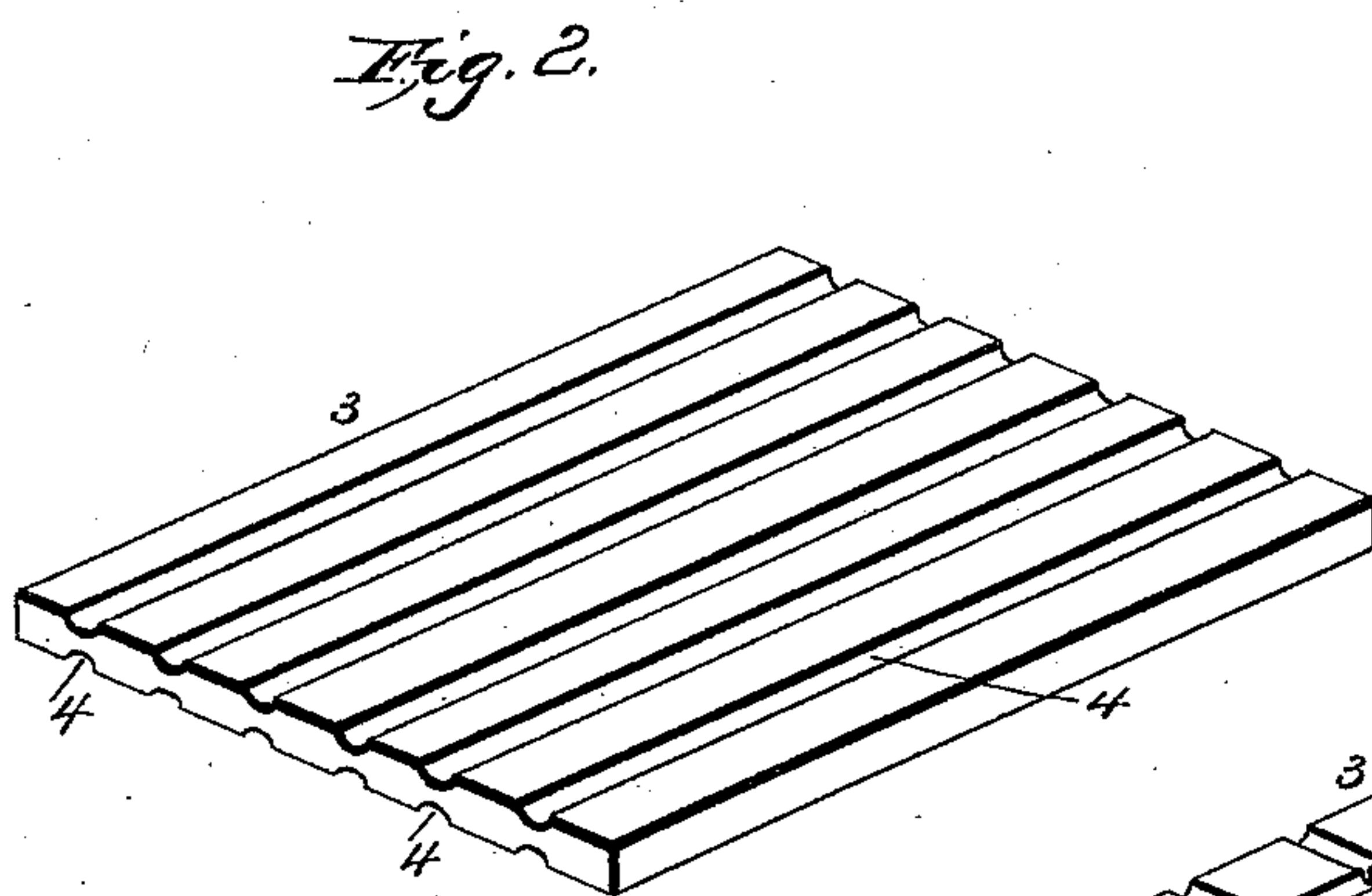
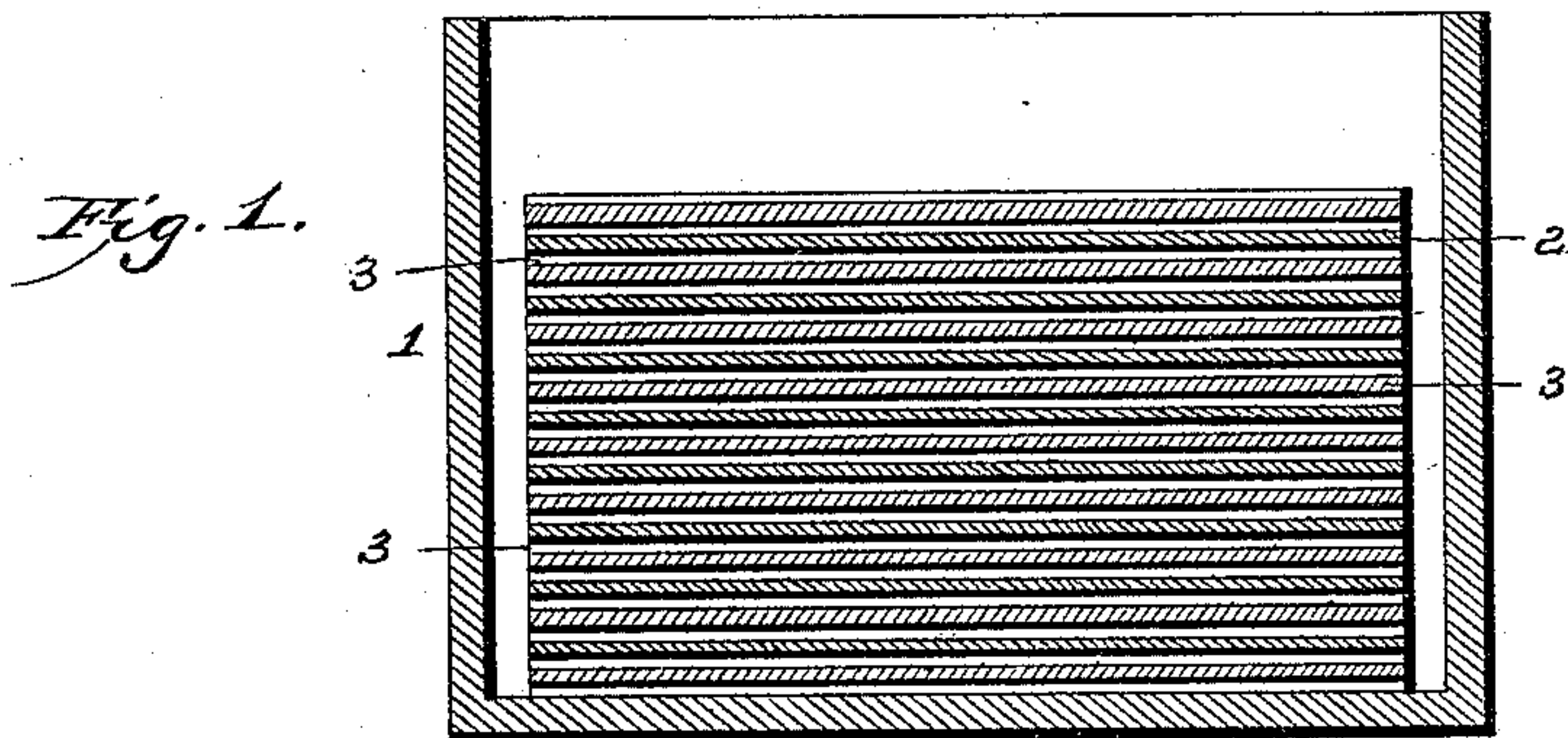


(No Model.)

I. W. MARSHALL.
PROCESS OF TREATING FIBROUS MATERIAL.

No. 428,925.

Patented May 27, 1890.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ISRAEL W. MARSHALL, OF YORKLYN, DELAWARE.

PROCESS OF TREATING FIBROUS MATERIAL.

SPECIFICATION forming part of Letters Patent No. 428,925, dated May 27, 1890.

Application filed February 11, 1890. Serial No. 340,028. (No model.)

To all whom it may concern:

Be it known that I, ISRAEL W. MARSHALL, a citizen of the United States, and a resident of Yorklyn, in the county of New Castle and State of Delaware, have invented certain new and useful Improvements in the Process of Treating Fibrous Material; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved method of treating vulcanized or gelatinized fiber, celluloid, leatheroid, and other fibrous material, whereby blistering of the sheets during the operation of washing or soaking is obviated, and liability of damage to the sheets from this and similar causes is avoided.

The usual method of vulcanizing fiber consists in passing a sheet of fibrous material through a bath of chloride or sulphate of zinc, or subjecting the material to the action of sulphuric, nitric, or muriatic acids, by which the material is entirely changed in its character, structure, &c. The sheets thus chemically prepared are then subjected to a washing process for the purpose of removing the free acids or other uncombined converting agents, which would cause deterioration of the material if not removed, by standing or placing them in a vertical position in a vat or vessel filled with water. During this washing or soaking process the sheets are frequently damaged and injured and rendered worthless by what is known as "blistering"—that is, by eruptions or blisters forming on the surface thereof, caused by the formation of gases due to the presence of the chemicals used in the converting process.

Now the object of my invention is to obviate the above defects and provide a method by which blistering of the sheets is prevented during the operation of washing, and all danger of damage or injury to the sheets from such cause is avoided.

The invention consists in the method of treating the sheets by confining each sheet between corrugated boards in the washing-vessel and subjecting them to the action of a current of water, substantially as described, whereby the free acids or other converting

agents are eliminated therefrom while under pressure, whereby all danger of injury due to formation of blisters is avoided.

The invention also consists in the method hereinafter described of treating sheets of fibrous material during the washing process by confining each sheet between corrugated and perforated boards in the washing vat or vessel, as hereinafter fully set forth.

In the accompanying drawings, Figure 1 represents a central sectional view of a washing vat or vessel, showing my improved method of confining the sheets of fibrous material therein. Fig. 2 is a perspective view of one of the confining boards or plates, showing the corrugations therein; and Fig. 3 is a similar view of a plate or board provided with corrugations and perforations.

In the said drawings, the reference-numeral 1 designates the washing vat or vessel, preferably composed of wood or some other material that will not be affected by the acids or other converting agents, and square or rectangular in shape. It may be of any suitable dimensions desired or as will be found most convenient in practice. The fibrous sheets as they come from the converter are usually about four by six and one-half feet in size, and the confining plates or boards should of course be of corresponding size. The numeral 2 designates a series of sheets, and the numeral 3 the confining-boards in series in position within the vat. These boards are generally rectangular in shape and of sufficient thickness to withstand the pressure to which they are to be subjected without liability of being injured. They may be made of any suitable material, preferably such as will be unaffected by the converting agents. As seen in Fig. 2, these boards are provided with a number of corrugations or depressions 4 upon each face, parallel to each other and extending from end to end, forming passages for the water or other washing or cleansing fluid.

In Fig. 3 I have shown the faces of the boards provided with corrugations or depressions crossing or bisecting each other at right angles, and also as being provided with a number of perforations extending through the same. It is obvious, however, that these

corrugations may be diagonal, zigzag, or arranged in any other manner, or made to take any other direction so long as they form passages for the free circulation of the washing-
5 fluid.

In practicing my invention I take one of the boards and place it upon the bottom of the washing tank or vat. I then place a sheet of the fibrous material from the converter
10 upon the board and upon said sheet I place another board, and so on until the vat or tank is full or a sufficient number to be properly handled has been placed therein. Suitable weights may be placed upon the uppermost
15 board, or pressure may be applied by screws or in any other way desired or found convenient. The vat or tank should be somewhat larger than the pile of sheets and boards, so that there will be a space between the latter
20 and the interior of the tank. Water or other washing or cleansing fluid is then introduced into the tank or vat entirely surrounding the pile of sheets, and is made to continuously circulate through the passages in the boards by
25 means of a force-pump or other means, thus thoroughly washing and cleansing the sheets, which are prevented from blistering by being confined under pressure between the boards.
Having thus described my invention, I claim

and desire to secure by Letters Patent of the 30 United States—

1. The method herein described of treating sheets of fibrous material during the washing process, which have previously been sub- 35 jected to the action of acids or other chemical converting agents, said method consisting in confining each sheet under pressure between boards or plates having corrugated faces, and subjecting them to the action of a washing or cleansing fluid, substantially as described. 40

2. The method herein described of treating sheets of fibrous material during the washing process, which have previously been subjected to the action of acids or other chemical con- 45 verting agents, said method consisting in confining each sheet under pressure between boards or plates having corrugated and perforated faces, and subjecting them to the action of a washing or cleansing fluid, substantially as described. 50

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

ISRAEL W. MARSHALL.

Witnesses:

AUGUST PETERSON,
BENNETT S. JONES.