

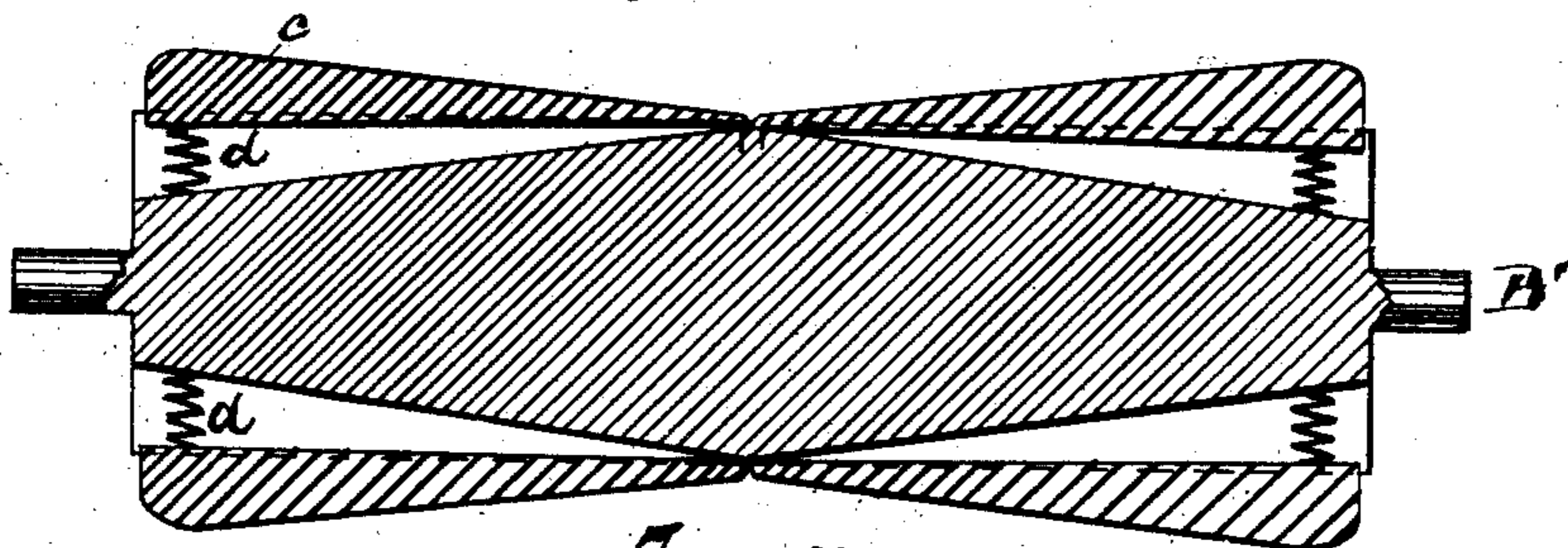
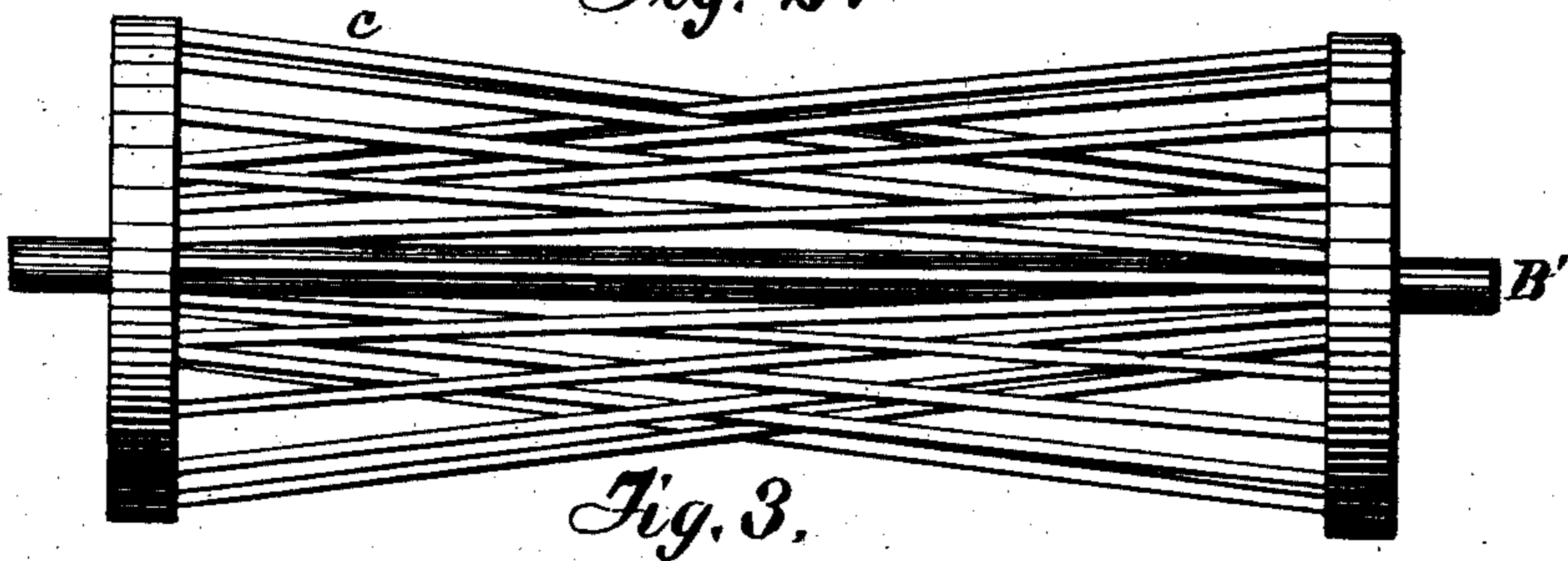
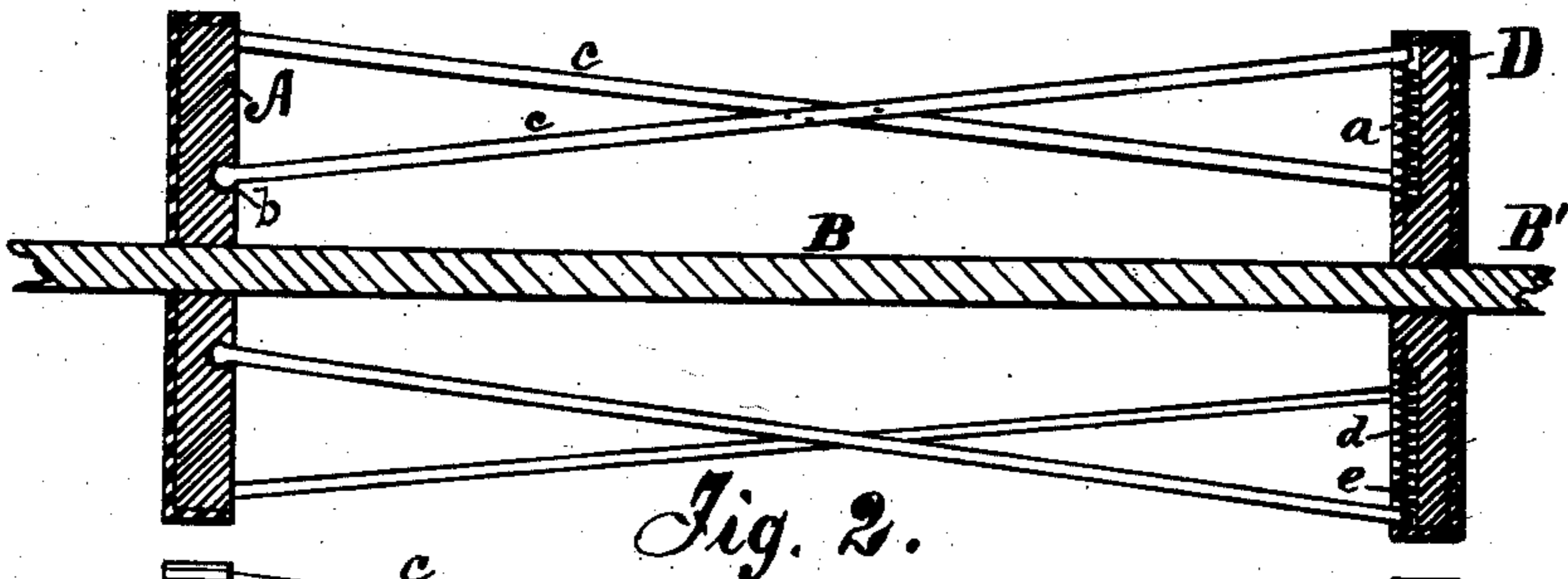
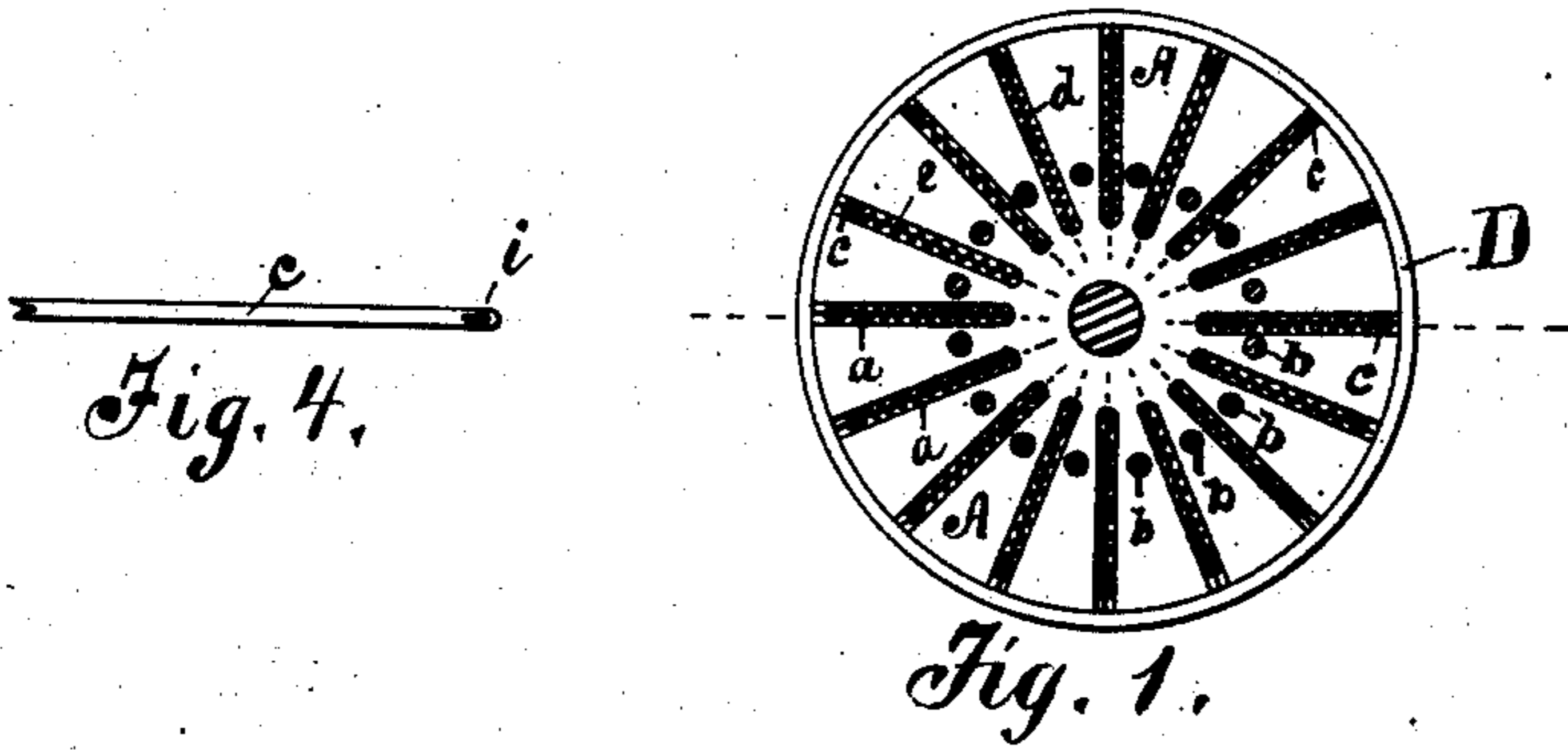
(No Model.)

T. SHIRLEY.

HAT FELTING OR SIZING MACHINE.

No. 244,939.

Patented July 26, 1881.



Attest:
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Inventor:
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by O. Drake, Atty

UNITED STATES PATENT OFFICE.

THOMAS SHIRLEY, OF NEWARK, NEW JERSEY.

HAT FELTING OR SIZING MACHINE.

SPECIFICATION forming part of Letters Patent No. 244,939, dated July 26, 1881.

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

To all whom it may concern:

Be it known that I, THOMAS SHIRLEY, of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Hat Felting or Sizing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to the construction and operation of the rolls between which hat-bodies are placed and compressed in the process of felting or sizing the same, the object of which is to facilitate the operation and to secure better results as compared with the use of the ordinary rolls, which are chiefly made of wood, or partially so, and their surfaces corrugated or otherwise ridged, but which are substantially rigid or unyielding.

This invention consists in rolls having flexible or yielding surfaces, and also constructed of material less liable to expand and contract or to be roughened by the action of steam or boiling water, in which they are partially or wholly submerged; and, further, in certain details of construction, all as will be hereinafter more fully set forth, and embodied in the claims.

In the accompanying drawings, in which similar letters of reference indicate corresponding parts in each of the several figures, Figure 1 is an inner face view of one of the heads of my improved roll. Fig. 2 is a longitudinal transverse section taken through line *x* of Fig. 3, said Fig. 3 being an elevation of a roll embodying my improvements. Fig. 4 is a partial view of a rod, showing the slot therein; and Fig. 5 shows a modified form of constructing the roll.

In carrying out my invention I construct heads A, which are rigidly affixed to a shaft, B, forming journals B', projecting outwardly therefrom, provided with grooves *a* and apertures *b* for the reception of rods or bars *c* adjusted therein, and operating as follows, to wit: each rod or bar *c* has one of its ends loosely inserted in one of the apertures *b*, and the

other in one of the grooves *a*, (the opposite one,) and resting upon a spring, *d*, therein, the latter being coiled around and supported by a pin, *e*, which also passes loosely through a slot, *i*, in the rods, the adjustment of the latter at each end being such as to allow said rods to move back and forth in the grooves as the pressure of the hat-bodies thereon is increased or diminished in the process of felting, the springs constituting a yielding support or cushion for said rods, all of which is plainly indicated in the drawings. The heads, as herein shown, have the grooves and apertures arranged therein alike, and the bars or rods are adjusted loosely in the same in the manner shown, or any other convenient method may be adopted. The said rods pass from said apertures (in which they may be secured by a ball-and-socket joint, or otherwise) to the opposite grooves in the opposite head, entering the same at a point above the springs. The said grooves are or may be placed radially around the shaft *b*, having the apertures between them at the point indicated. The apertures in one head will lie opposite the grooves in the other; but I do not wish to limit myself to this exact construction, as the bars may be arranged in such a manner as to form collectively a single truncated cone, the apertures all being in one head, and the grooves containing the springs in the other, or the bars may be horizontal, if preferred, or solid or tubular.

The advantage of rolls having yielding surfaces will be readily appreciated by those versed in a knowledge of the business, and more especially when the whole surface from end to end of the rolls is yielding, as in the present case.

When a hat-body is first removed from the forming-cone it is extremely delicate and tender, requiring very careful usage and treatment, in order to avoid injuring it by any undue tension upon the same; hence, to this end, rubber cloths have been employed to infold the hat-bodies; also steam tumbling-barrels and other contrivances, all of which, however, are more or less tedious, expensive, and therefore objectionable, but which, by the use of my invention, are dispensed with without risk or injury to the felt, and better results obtained

at a great saving of time and labor, as the hat-bodies may be taken direct from the cones and hardening-benches, and in their weakest condition folded simply in a piece of common porous cloth, such as is used when felting by hand, through which the water will freely penetrate, (a very essential requisite,) and placed between my improved rolls and finished without risk of being injured by any undue strain upon the fabric, the pressure upon the felt by the rolls being equally and evenly distributed, owing to the peculiar construction, arrangement, and operation of said rolls.

I do not limit myself to the specific form of construction above described, as a somewhat similar result may be obtained by changing the same in various ways. For example, a cylinder may be used, and rods or bars may be pivoted at one end, at or near the center of said cylinder, and their opposite ends arranged to have substantially the same motion as those first described, the chief object being to obtain a yielding surface. The arrangement of parts hereinbefore described, however, forming a skeleton-roll, has the desirable advantage of allowing the water to circulate freely between the rods and around the hat-bodies lying between them.

I prefer to make my rolls of some non-corrosive material, such as brass or other appropriate substance not liable to rust, swell, split, warp, or be otherwise injured by the necessary exposure to steam and boiling water.

The heads A may be made in a skeleton form or solid, or in several parts, and secured by a band or a cap, as D, or in any other desirable form.

The rolls are designed to be adjusted in a frame and arranged in groups of three or more and operated in the usual manner.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a hat sizing or felting machine, a roll or rolls having a yielding surface, as and for the purposes set forth.

2. In a hat sizing or felting machine, a roll

or rolls constructed in a skeleton form, substantially as and for the purpose set forth and shown.

3. In a hat sizing or felting machine, a roll or rolls constructed in a skeleton form and having a yielding surface or surfaces, substantially as and for the purposes set forth and shown.

4. In a hat sizing or felting machine, a roll or rolls consisting of heads, as A, and a series of rods or bars, as c, arranged and secured therein in the order and form substantially as shown, for the purpose set forth.

5. In a hat sizing or felting machine, a roll or rolls consisting of heads, as A, and rods, as c, arranged and secured therein, so as to constitute a yielding surface, as and for the purposes set forth.

6. In a felting-machine, the combination of heads A, rods c, and springs d, as and for the purpose set forth and shown.

7. In a felting-machine, the yielding bars c, substantially as and for the purpose set forth and shown.

8. In a felting-machine, heads A, having radial grooves therein, in which work bars c, as and for the purposes set forth.

9. In a felting-machine, the combination, with the head A and bars c, of means adapted to prevent said bars from passing from engagement with said heads, as and for the purpose set forth.

10. The combination, in a felting-machine, with bars c, of springs working within grooves, as and for the purpose set forth.

11. In combination in a felting-machine, heads A, bars c, springs d, and rods e, all arranged substantially as and for the purposes set forth and shown.

In testimony that I claim the foregoing I have hereunto set my hand this 18th day of February, 1881.

THOMAS SHIRLEY.

Witnesses:

OLIVER DRAKE,
CHARLES H. PELL.