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J. A. SACKVILLE.

APPARATUS FOR OPENING, SPREADING, AND STRETCHING TEXTILE FABRICS.

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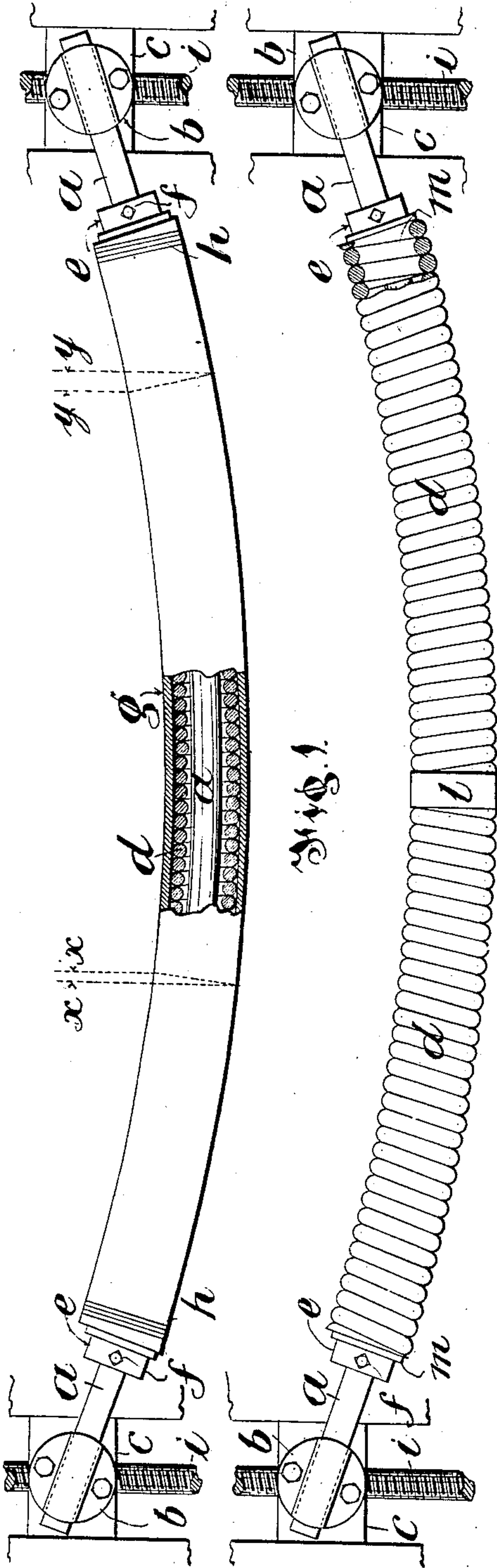


Fig. 1.

Fig. 2.

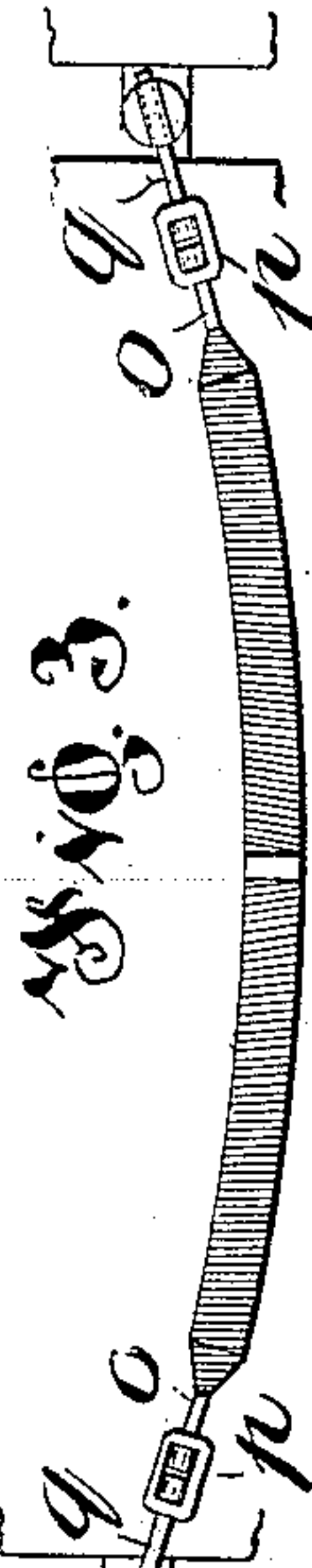
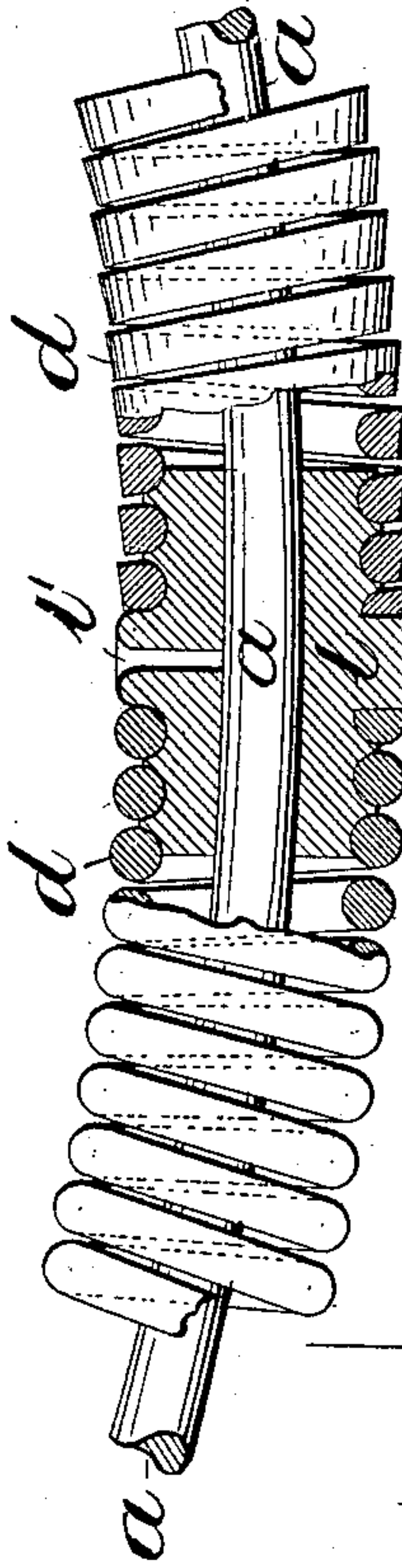


Fig. 3.

Fig. 4.

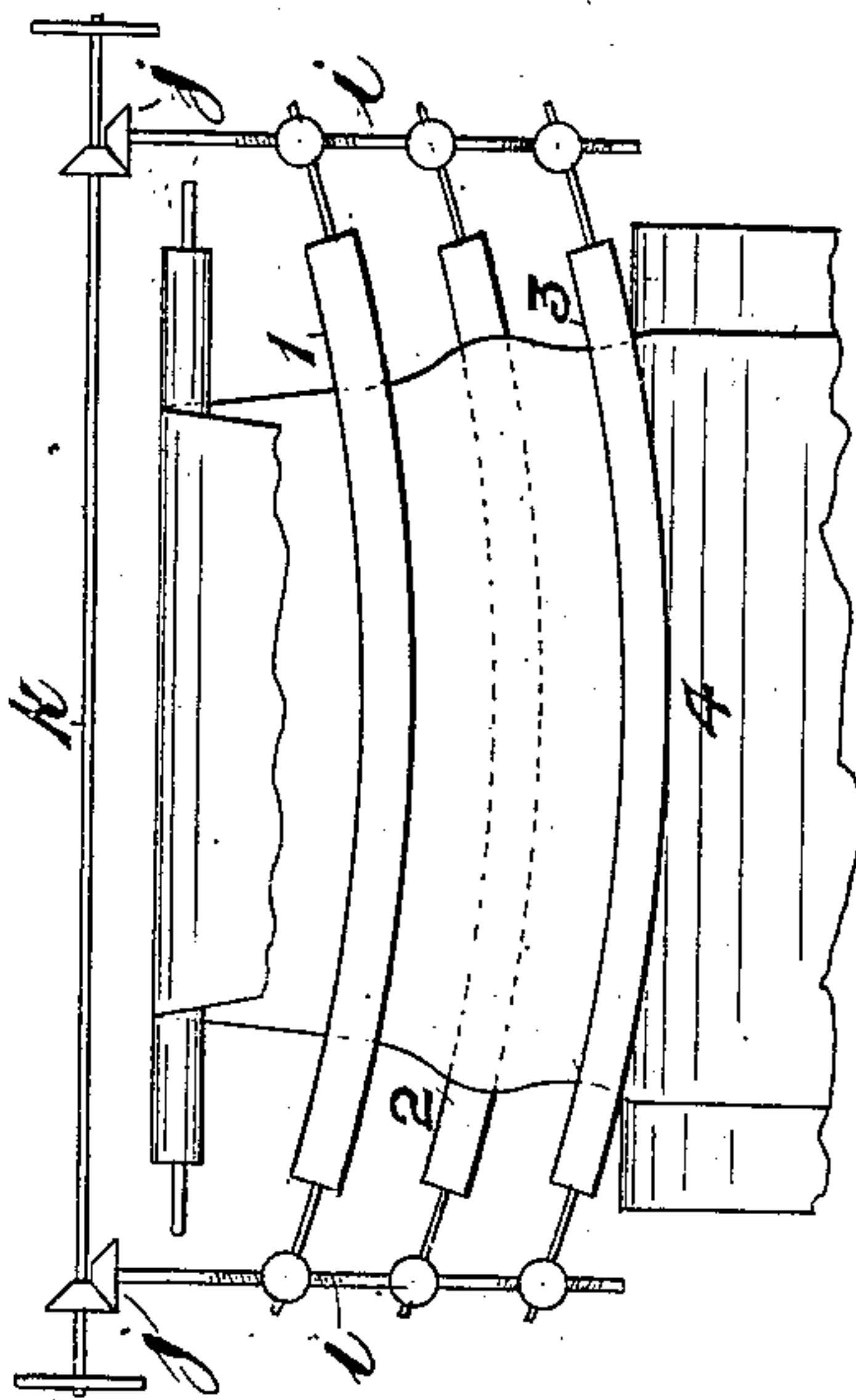


Fig. 5.

Fig. 6.

Witnesses:
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UNITED STATES PATENT OFFICE.

JAMES ALLAN SACKVILLE, OF MANCHESTER, ENGLAND.

APPARATUS FOR OPENING, SPREADING, AND STRETCHING TEXTILE FABRICS.

No. 829,805.

Specification of Letters Patent.

Patented Aug. 28, 1906.

Application filed October 7, 1904. Serial No. 227,605.

To all whom it may concern:

Be it known that I, JAMES ALLAN SACKVILLE, a subject of the King of Great Britain and Ireland, and a resident of Pendlebury, Manchester, England, have invented certain new and useful Improvements Relating to Apparatus for Opening, Spreading, and Stretching Textile Fabrics, of which the following is a specification.

10 This invention refers to and consists of a new or improved construction of arched expander for opening, spreading, and stretching textile fabrics, the chief merit of which is that it is much cheaper to produce and less
15 liable to get out of order than the ordinary make of arched expander, besides being more effective in action.

In essence the improved expander consists of a flexible shaft with or without a flexible
20 protective covering and held to an arch formation across the fabric to be treated, the distance between the two ends of the expander being slightly greater than the widest width of fabric. The said shaft is composed,
25 preferably, of coiled wire, and the coiling of the wire is either the same from end to end of the shaft or one-half of the shaft is of a right-hand coil and the other half of a left-hand coil, so that the shaft may be used with the
30 protective covering for delicately-tinted fabrics and without the said covering for other fabrics.

Upon the accompanying drawings, Figure 1 illustrates a front view, partly sectional, of
35 the improved expander in its most usual form—i. e., inclosed in a sheath of flexible protective material. Fig. 2 illustrates a like view of the improved expander, partly sectional, without the flexible protective covering.
40 Fig. 3 illustrates the central portion of Fig. 2 to an enlarged scale. Fig. 4 illustrates diagrammatically the use of the expander. Fig. 5 illustrates the manner of adjusting the expanders to increase or decrease the "bite"
45 of the fabric. Fig. 6 illustrates a modification.

Referring to Fig. 1, *a* is a curved round bar of about one inch diameter and held at each end to the machine-frame by clamping-plates
50 *b* and blocks *c*. Onto such bar is threaded a length of coiled wire *d* of about three-eighths of an inch gage, the inner diameter of the coils being preferably such as to be an easy fit and allow the coils to readily rotate around
55 the bar. At each end the coiled wire is held against lateral movement by collars *e*, fixed

on the bar by set-screws *f*. Neatly fitting over the coiled wire is a sheath or sleeve of flexible material *g*, preferably india-rubber, its own contraction or suitable wrappings *h*
60 at each end serving to keep the sleeve in position.

When in use, the expander is usually used with two others. (See Fig. 4.) The fabric to be treated first passes behind the upper-
65 most expander 1, then in front of the middle expander 2, then behind the lowermost expander 3, and finally onto the drying-cylinder 4. In thus passing over the expanders the fabric is caused to rotate each expander
70 around its curved bar *a* and with every point of its exterior surface to right and left of the center of its length rotating in a plane divergent from the plane of every other point, and such divergency gradually increasing to-
75 ward the ends of the expander the fabric is gradually opened or spread out from its center outward in the most effective manner possible. By broken lines *xx* I show the amount of stretch near the center of the expander
80 and by broken lines *yy* the amount of stretch near the end of the expander. To increase the bite of the fabric, the expanders 1 and 3 are adjustable, the blocks *d* being carried by right and left handed screws *i*, so that on
85 rotation of the screws the upper and lower expanders approach or recede from the middle expander, and thus increase or decrease the amount of fabric in contact with the surface of the expanders. (See Fig. 5.) To
90 insure even adjustment at both ends, the screws *i* may be operated by bevel-wheels *j* and a shaft *k* common to both.

When the expander is designed to be always used with the flexible covering *g*, the
95 coiling of the wire *d* may be of the same from end to end of the expander; but when the expander is designed to be used sometimes without and sometimes with the covering the coils of one-half the length of the ex-
100 pander will be right-handed and the coils of the other half left-handed. (See Figs. 2 and 3.) The wire in such case may be in one piece, but in practice it will usually be in two pieces joined by a central block *l*, onto the
105 oppositely-grooved ends of which the wire is tightly wrapped, as shown in Fig. 3. At each end the coils will also wrap onto bushes *m*, which, like the block *l*, neatly fit and are free to rotate on the bar *a*. Fixed end collars
110 *e* are also used, as in Fig. 1. In this arrangement the wire is preferably round, but it may

be of a section which produces a stepped formation. (See Fig. 3.)

When the unprotected expander is used in series, the convolutions of the intermediate
5 expander are the reverse of those of the other expanders, so that such intermediate expander shall not tend to undo the work of the other expanders. Instead of mounting the expander on a bar it may be set to a given
10 arch during the course of its manufacture and be suspended by short rods *o*, swivels *p*, and rods *g*, (see Fig. 6;) but I prefer to use the bar. In this modification the expander may also be used with or without the sleeve
15 *g*. The exterior of the flexible sleeve *g* or that of the coiled wire *d* will usually be plain; but it may be roughened. The coils in all cases are preferably loosely coiled, so as to afford a slight lateral elasticity.

20 What I claim is—

1. For opening, spreading and stretching

fabrics, an expander composed of a length of coiled wire and a sheath of flexible material surrounding such coiled wire, and means for holding such expander in an arched formation
25 across the fabric, and allowing it to rotate under the contact and traverse of the fabric, as set forth.

2. For opening, spreading and stretching fabrics, an expander composed of a length of
30 coiled wire with one half coiled to the right and the other half coiled to the left, and means for holding such expander in an arched formation across the fabric and allowing it to rotate under the contact and traverse of the
35 fabric, as set forth.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JAMES ALLAN SACKVILLE.

Witnesses:

JOHN CAMP,

PICKLES D. BAILEY.