

(No Model.)

2 Sheets—Sheet 1.

S. D. LOCKE.
GRAIN BINDER.

No. 252,482.

Patented Jan. 17, 1882.

Fig. 1.

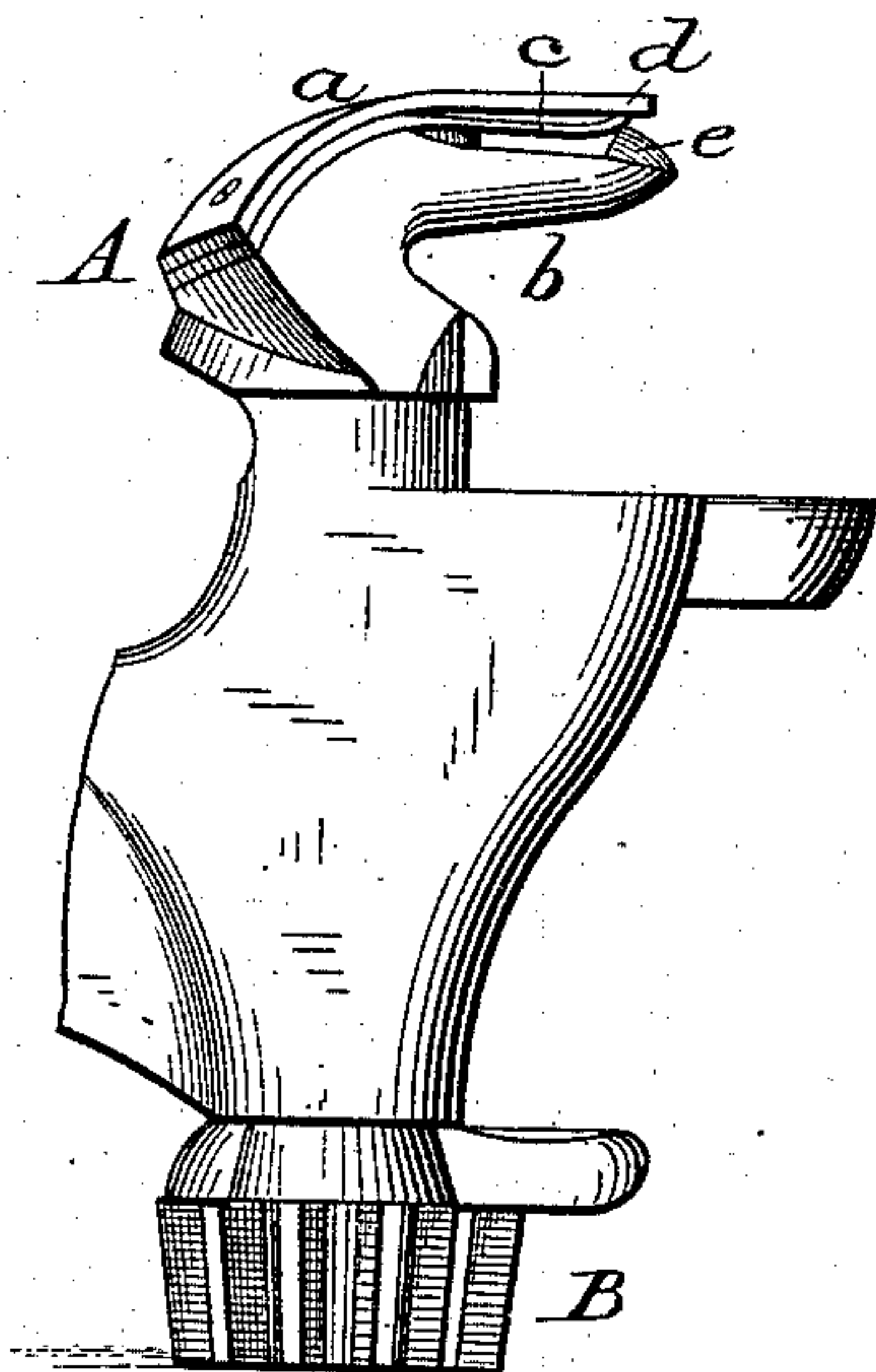


Fig. 2.

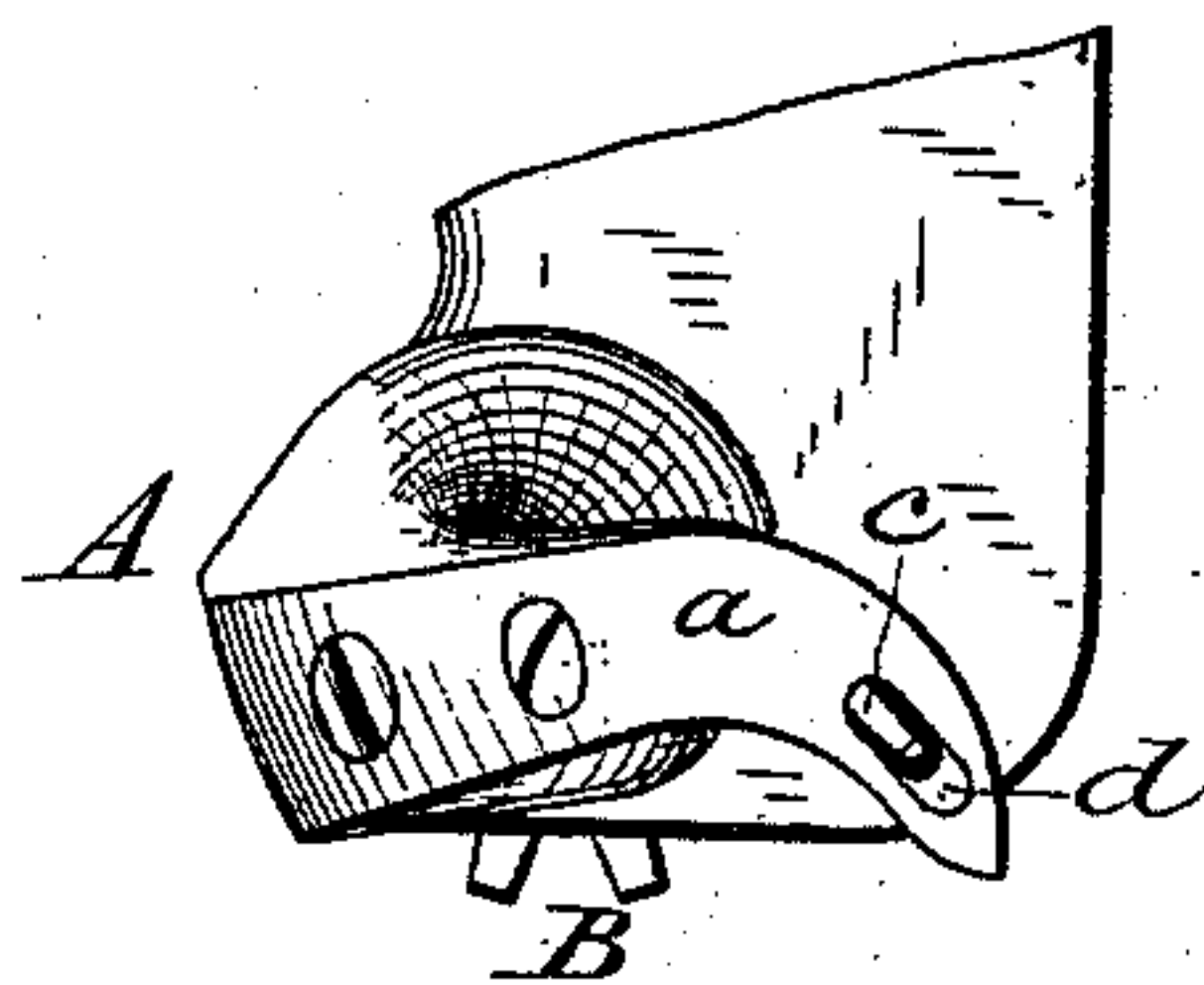
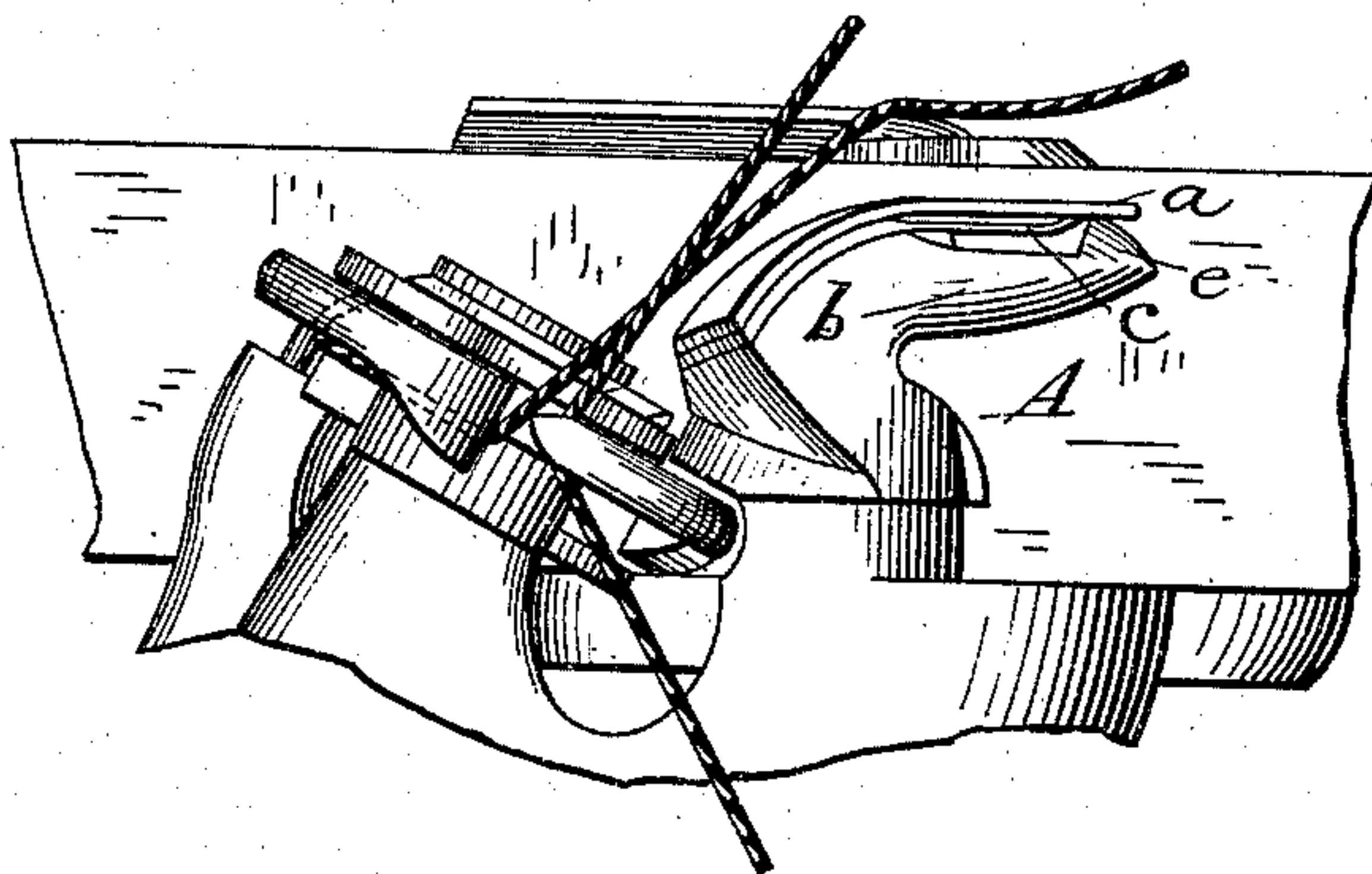


Fig. 3.



Witnesses.

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By Parkinson & Panenmond
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(No Model.)

2 Sheets—Sheet 2

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Fig. 4.

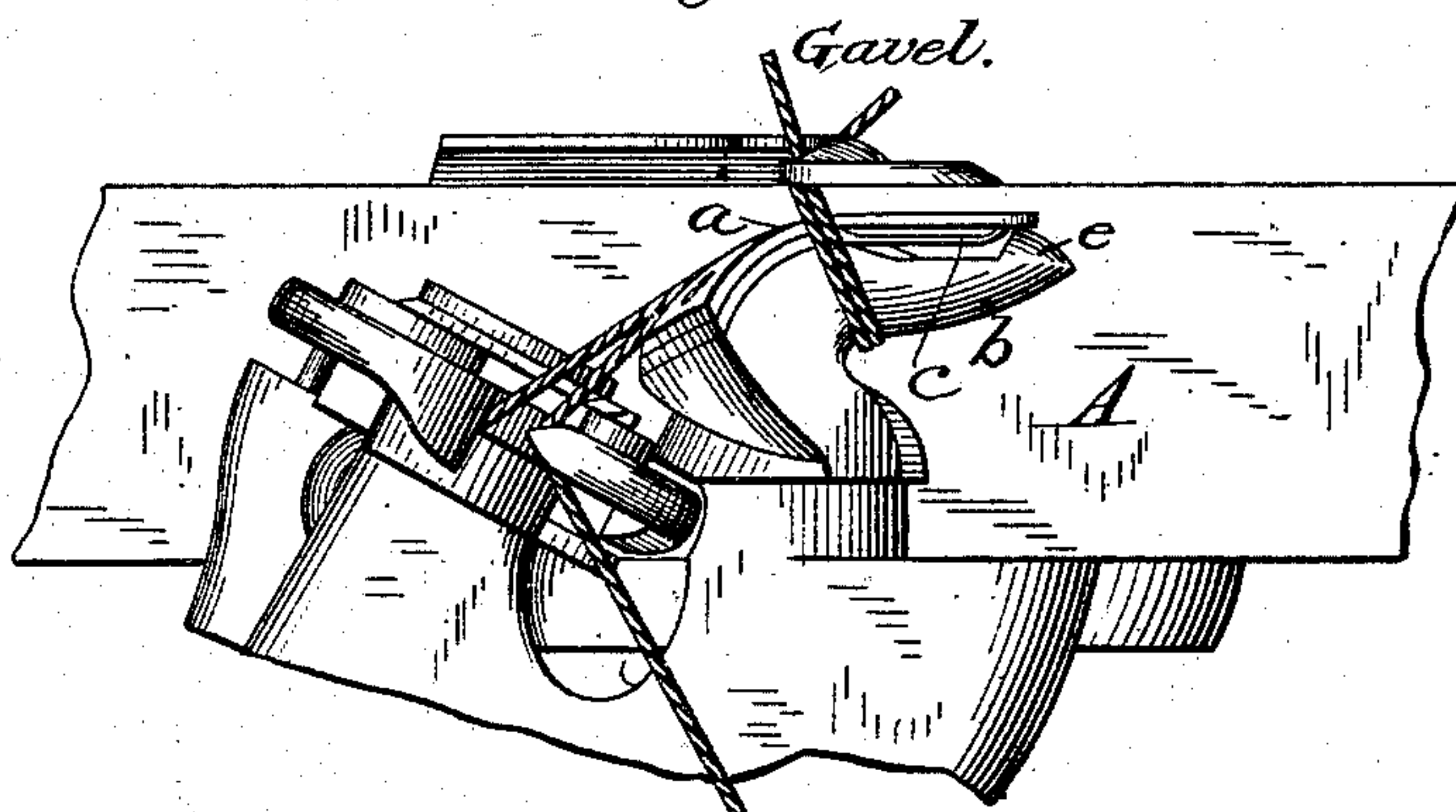


Fig. 5.

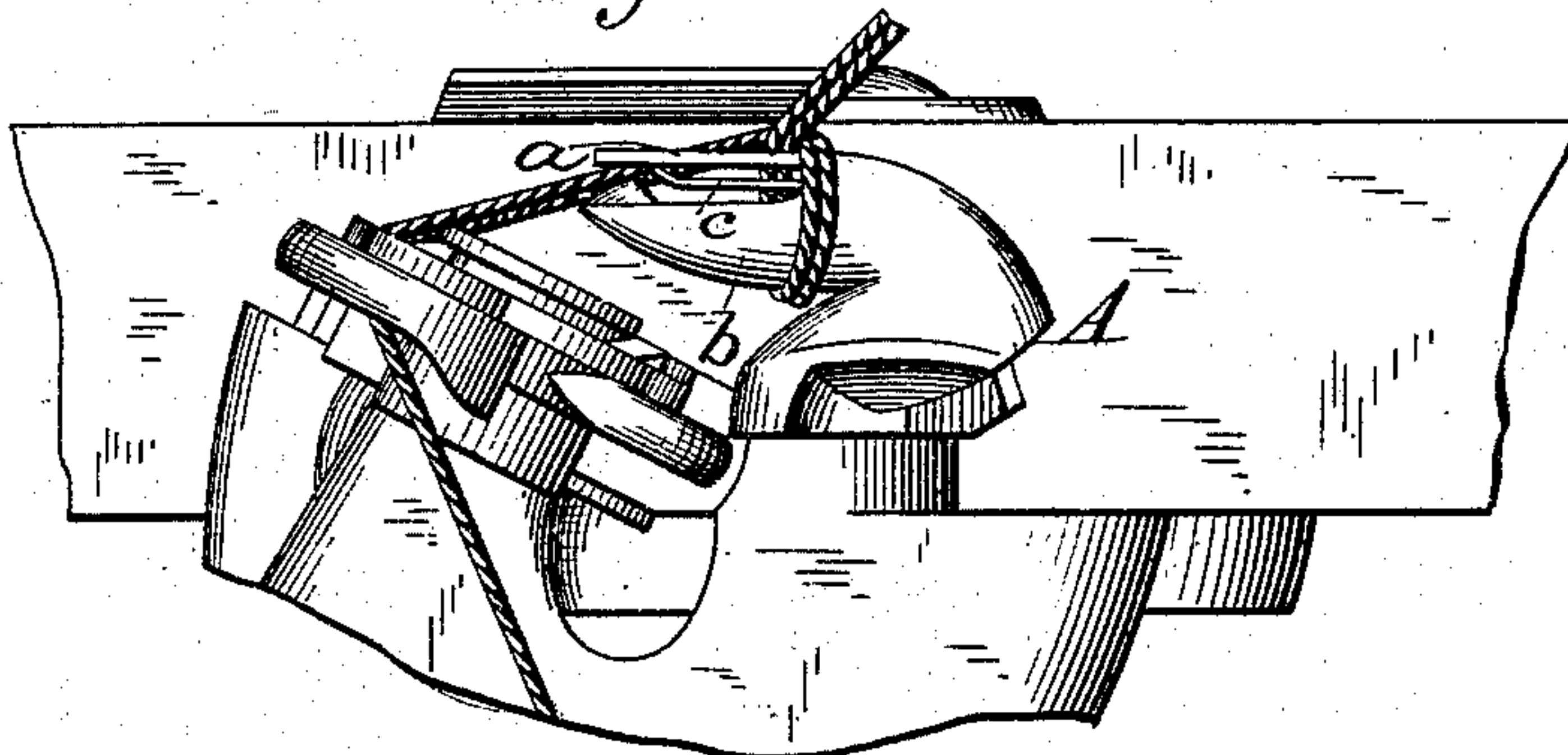
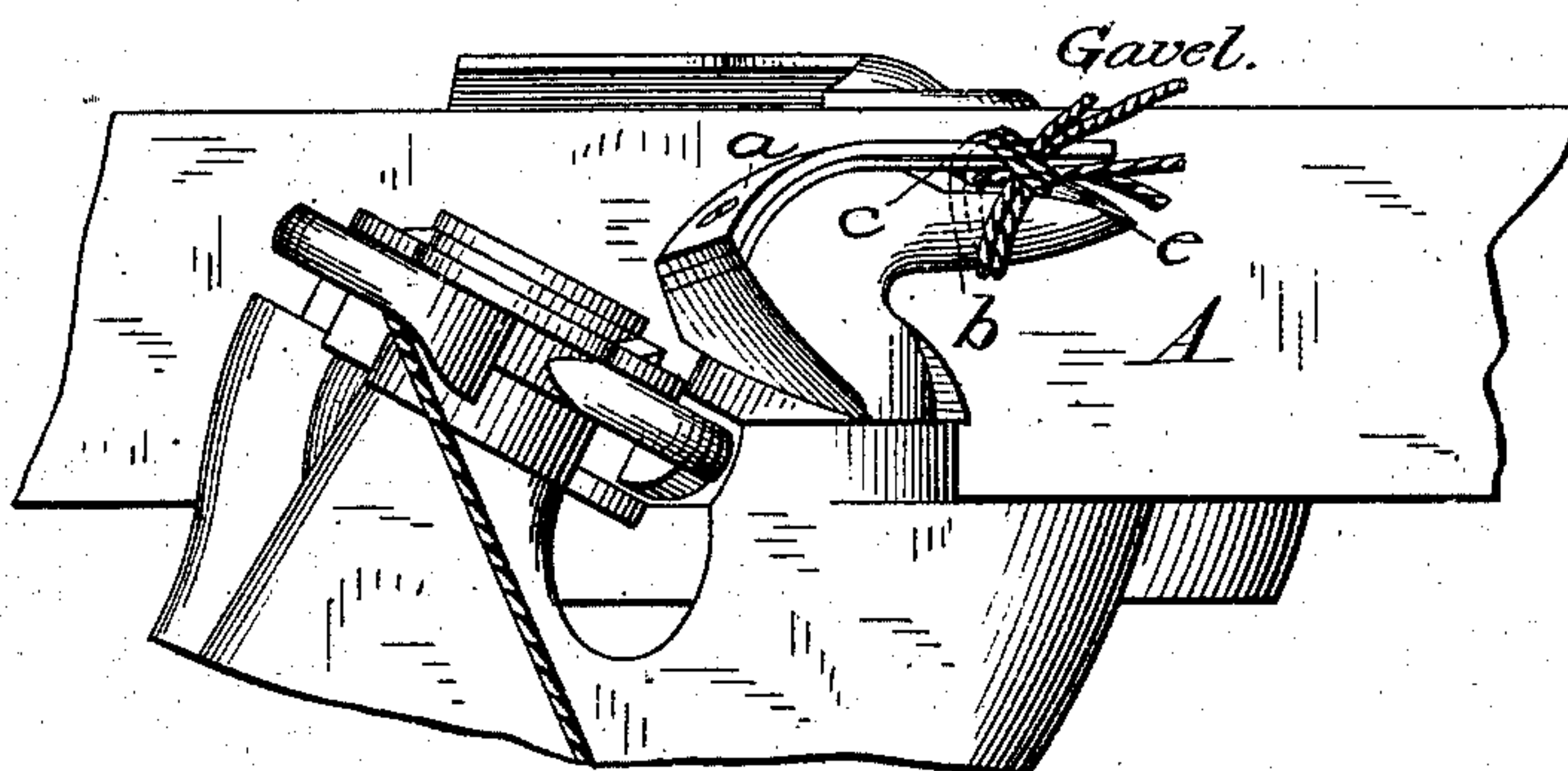


Fig. 6.



Witnesses.

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UNITED STATES PATENT OFFICE.

SYLVANUS D. LOCKE, OF HOOSICK FALLS, NEW YORK.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 252,482, dated January 17, 1882.

Application filed March 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, SYLVANUS D. LOCKE, of Hoosick Falls, in the county of Rensselaer and State of New York, have invented certain
5 new and useful Improvements in Grain-Binders, of which the following is a specification.

My invention relates to knotting mechanism for uniting the ends of a cord band, and more particularly to such knotting devices as resemble
10 in themselves or in a functional element of their construction those now generally known as "tying-bills;" and it consists in applying to the inner face of one of the jaws of a knotter or tying-bill a spring-presser, which may act
15 to a greater or less extent upon the cord held between said jaws, while the jaws themselves may retain their relative positions; and in the various combinations and details of construction hereinafter pointed out and claimed.

20 In the drawings, Figures 1 and 2 are respectively side and top views of a tying-bill or looping and tying head embodying my invention; Fig. 3, a view including holding and cutting devices, and showing the position of the cord
25 just before the looping and tying head begins to operate; and Figs. 4, 5, and 6 show the positions of the cord and of the head at successive stages in the operation of the latter.

A represents a tying head or bill having two
30 jaws, *a* and *b*, and mounted, as usual, upon the end of a short shaft or spindle, and driven by means of a pinion, B, which will advisably have a delay-shoe, or be equivalently controlled to cause intermittent action of the head and
35 to stop it in its proper position. In the present instance the tying-head is formed as a true tying-bill, having an irregularly curved or cam-shaped exterior surface to which its jaws contribute, and which guides or assists to guide
40 the strands of cord into position to form the knot as the head revolves; but it will be obvious, as my invention is hereinafter explained, that certain of its salient features may be employed in various other knotting devices, as in
45 those wherein a shaft carrying laterally-projecting jaws works, in connection with a surrounding tube receiving said jaws in its end after the cord has been caught, so as to present a flush or substantially flush terminal surface,
50 over which the strands are crossed to form the loop. The ends of the cord, after the loop has

been formed and crossed by the revolution of the knotter, are carried in between the jaws, and there held while the loop is pulled or pushed off upon them and the knot tightened. 55
Heretofore, it has for this purpose either been tightly clamped between the meeting faces of said jaws or checked by a lug or stop at their point, while measurably free in a limited space behind said stop. In order that it may be held 60
under a more or less yielding or elastic pressure, I apply to the inner face of the jaw *a* a spring-plate, *c*, which for some distance runs parallel with the inner face of the opposing jaw *b*, and then near the nose or point of the 65
jaws is turned up into an aperture or recess, *d*, into which it may sink or play. The cord between the jaws will therefore be pressed upon by the spring, which will yield to accommodate itself to the pull or stress or to different sizes 70
of cord without necessarily affecting the relation between the jaws themselves.

To prevent the strands of cord from wedging out from beneath the spring before the proper time, I form upon the point of the jaw 75
b a lug or rib, *e*, behind which the end of the spring comes, and which will afford a substantially positive stop to the escape of said strands in the tying operation; and that the strands may pass in between the jaws without being 80
obstructed by the spring, I arrange the turned-up end of the latter at an easy incline, so that it may be raised or pushed aside when the strands come forcibly against it. The inner face or back of the lug will also preferably be 85
slightly inclined or beveled, so that when the completed knot is drawn or released from the jaws it may not unduly obstruct it.

In Letters Patent granted me July 29, 1879, and numbered 218,038, I have described a ty- 90
ing-bill having a rigid lower jaw provided with a rib or shoulder at the point and substantially corresponding with the jaw *b* herein shown, and an elastic upper jaw which yields to permit the entrance and escape of the cord and 95
in outline and location resembles the jaw *a*. The spring-presser may advantageously be applied to said elastic upper jaw; but the latter, being formed of a flexible plate, is liable to yield or bend as the loop is drawn tight and cause 100
it to bind; and I therefore prefer to make the jaw *a* of rigid material and provide for the ad-

mission and release of the cord by other means, either such as already known in the art or the arrangement now to be described. I secure the jaw firmly to the heel of the tying-bill and extend it over the crown until it overhangs and partly passes the rib upon the opposing jaw, with such a space between as to freely admit the strands of cord. The leaf or plate spring, which may be conveniently secured by the same means which fasten the jaw, is carried along the inner face of the latter at such normal distance as to bring it near its end below the crest of the rib on the other jaw and almost in contact with the rear face of said rib, and then rises, as before stated, toward its socket in the jaw *a* at an easy incline, so as to either touch or slightly clear the rib just behind its crest. The cord therefore, as it is brought between the jaws after the loop has been formed around them, will ride over the rib, push up the spring, and pass into the recess behind, when the spring, falling upon it, presses it against the lower jaw back of the rib, and so shuts off its exit until the proper time determined by the action of the machine.

In operation, the strands of cord, after they have been carried around the gavel by the usual carrying device or binding-arm, will run past the knotter, as in Fig. 3, to any suitable holding and cutting mechanism—as, for instance, that described in an application filed by me on the 31st day of December, 1879, and of which this is a division. The knotter is then started, and in its first revolution the strands of cord are brought to the position indicated in Fig. 4. As it completes the first half of its second revolution the loop is formed, and the ends leading to the holder are crossed upon the gavel portion and stretched past the mouth of the jaws. In the third quarter of said revolution they wedge in between the jaws, press up the spring, and drop behind the rib, where they are immediately secured by the return of the spring. The knotter then reaches the end of its revolution and is stopped, and the loop is pushed or drawn off upon the end strands, which are immediately severed. The completed knot is now pulled from the jaws, which, to further tighten it, is done forcibly, the spring being lifted with marked resistance and the bow escaping over the rib or shoulder. This action will, however, be more or less modified by the varying conditions or exigencies of the structure in which the spring is used, and if the cord be favorably presented one revolution of the knotter above described will be sufficient, instead of two.

It is evident that in a tying-bill the spring, instead of acting against the lower jaw and yielding toward or into the upper, may be caused to act against the upper jaw and yield toward or into the lower, and that in such case the cord will be compressed between said spring and upper jaw. Various other modifications will also suggest themselves to those familiar with this class of mechanism.

I am aware that in the patent granted to

Israel Lancaster, April 24, 1866, numbered 54,177, and afterward reissued, a spring is shown in connection with jaws of a knotter. This is distinguished, however, from the spring which I use in that it is not a plate or leaf spring, and is not between the jaws pressing the cord against the face of one, but outside of them, confining the cord against an edge.

I claim as my invention—

1. In a cord-knotter, an elastically-yielding plate or leaf spring beneath one of the jaws of said knotter and opposing the other, to press upon the cord between the two.

2. In a cord-knotter, the combination of a jaw having a shoulder at or near its point, an opposing jaw, and an elastically-yielding plate or leaf spring between the two and pressing on the cord toward the face of the shouldered jaw.

3. In a cord-knotter, the combination of a rigid jaw having a shoulder at or near its point, an opposing rigid jaw overlying the first and slightly clearing its shoulder, so as to leave a space between, and an elastically-yielding plate or leaf spring between the two jaws bent or beveled upward at its end to pass by the shoulder into a recess in the point of the second jaw.

4. In a tying-bill, the combination of a jaw having curved or cord-deflecting surfaces, an opposing jaw, and an elastically-yielding plate or leaf spring acting between the two from the face of one toward the face of the other, and substantially parallel along its length with the face toward which it presses.

5. In a tying-bill, the combination of the rigid lower jaw having curved or cord-deflecting surfaces, the opposing upper jaw, and an elastically-yielding plate or leaf spring beneath the face of the upper jaw and acting against the cord toward the face of the lower jaw.

6. In a tying-bill, the combination of the rigid lower jaw having curved or cord-deflecting surfaces and shouldered at its point, the opposing upper jaw, and an elastically-yielding plate or leaf spring beneath the face of the upper jaw and inclined or beveled at its outer end upward past the shoulder on the lower jaw.

7. In a tying-bill, the combination of the rigid lower jaw having curved or cord-deflecting surfaces and shouldered at its point, the opposing upper jaw recessed or perforated near its point, and an elastically-yielding plate or leaf spring beneath the face of the upper jaw, bent upward at its outer end past said shoulder and taking into said recess.

8. In a tying-bill, the combination of the rigid lower jaw having curved or cord-deflecting surfaces and shouldered at its point, the opposing upper jaw rigidly secured to the heel of the bill and overlying said shoulder, with a space between, and an elastically-yielding plate or spring underlying the face of the upper jaw and pressing toward the face of the lower jaw.

9. In a tying-bill, the combination of the
rigid lower jaw having curved or cord-deflect-
ing surfaces and shouldered at its point, the
opposing upper jaw rigidly secured to the heel
5 of the bill and overlying said shoulder, with
a space between, and an elastically-yielding
plate or leaf spring between the two jaws and
bent upward at its end to pass by the rib or
shoulder into a recess in the upper jaw near
its point.

SYLVANUS D. LOCKE.

Witnesses:

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JOHN W. CORSON.