

(No Model.)

J. BENNYWORTH.

CANE MILL.

No. 312,072.

Patented Feb. 10, 1885.

Fig. 1.

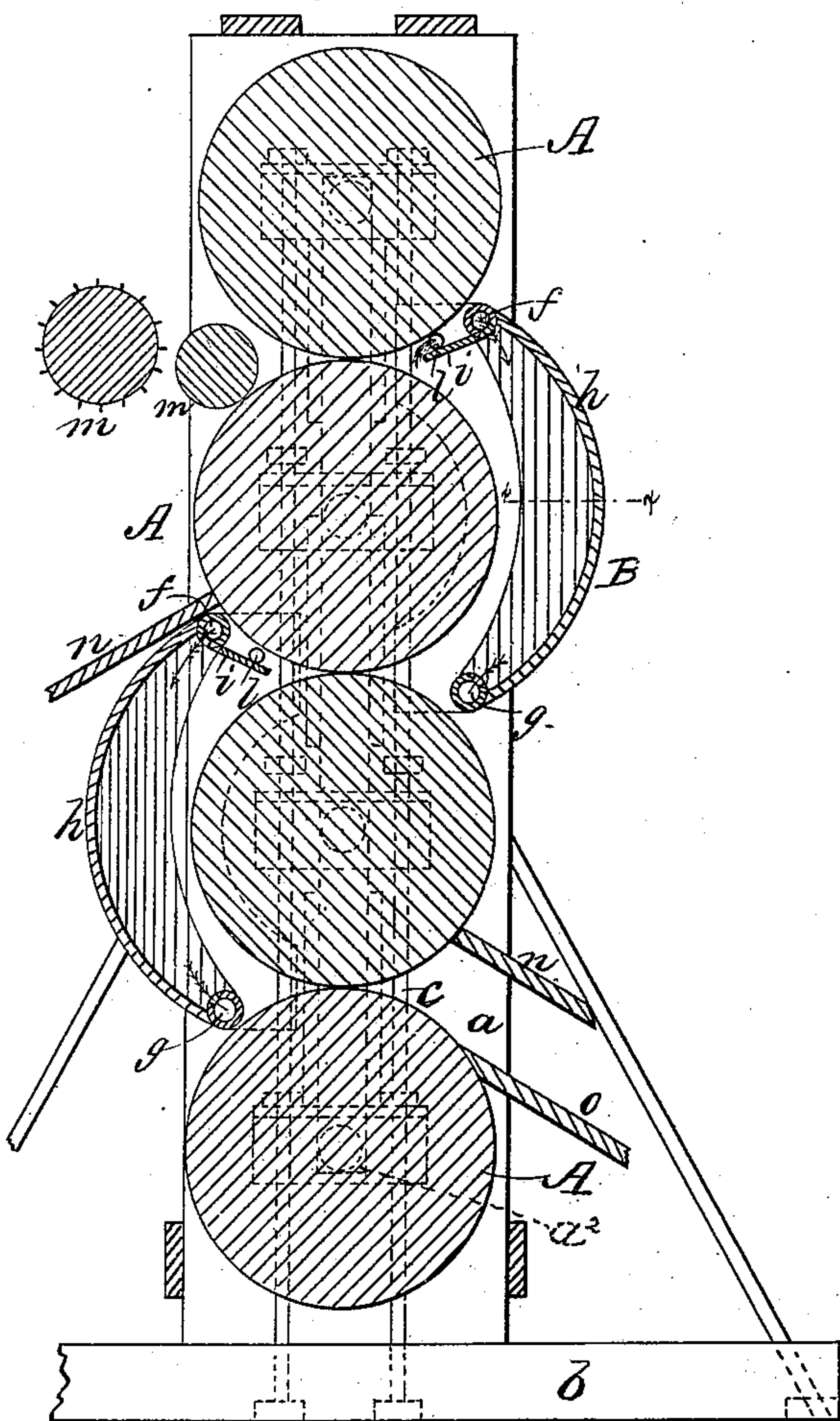


Fig. 2.

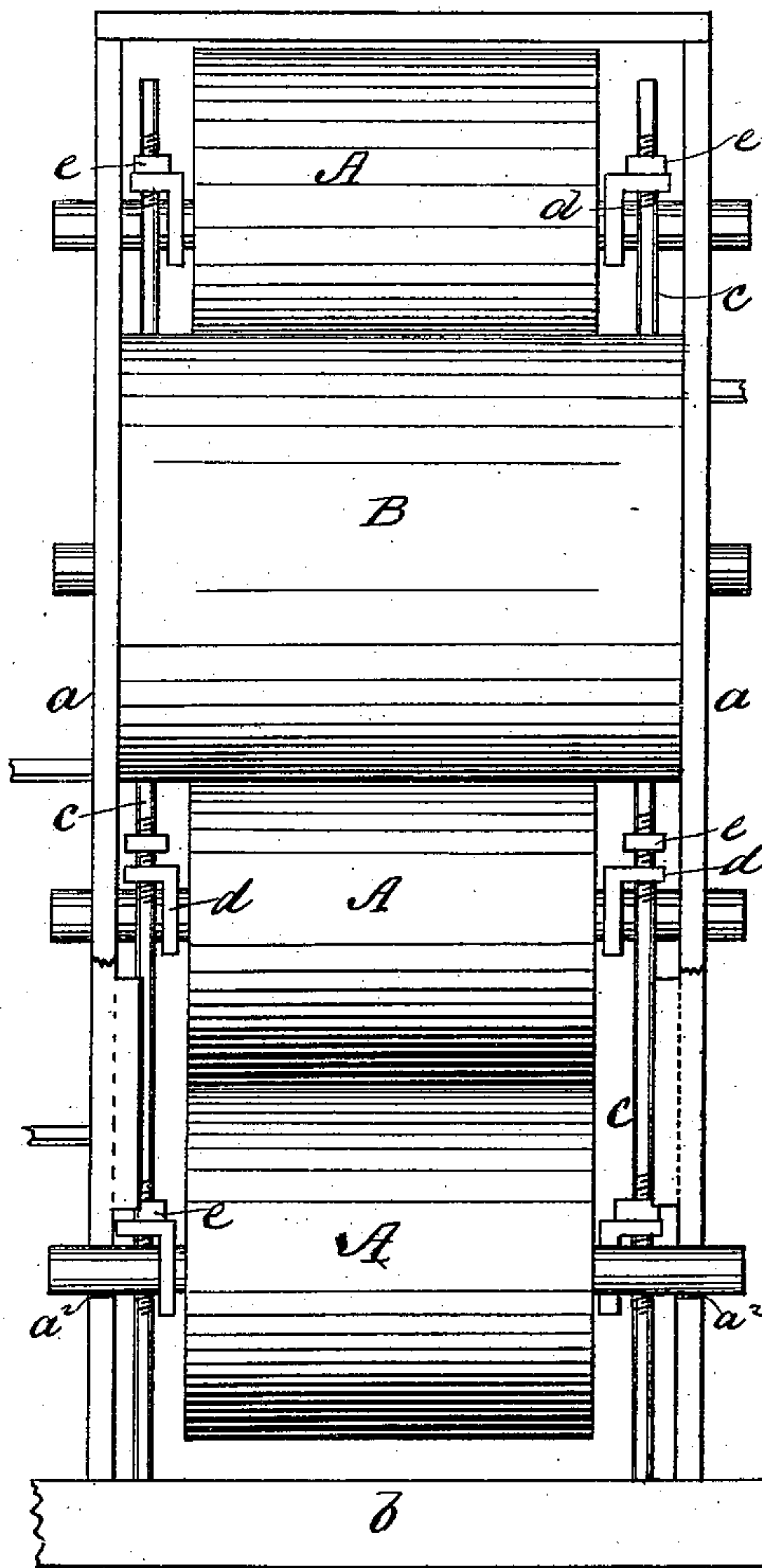


Fig. 3.

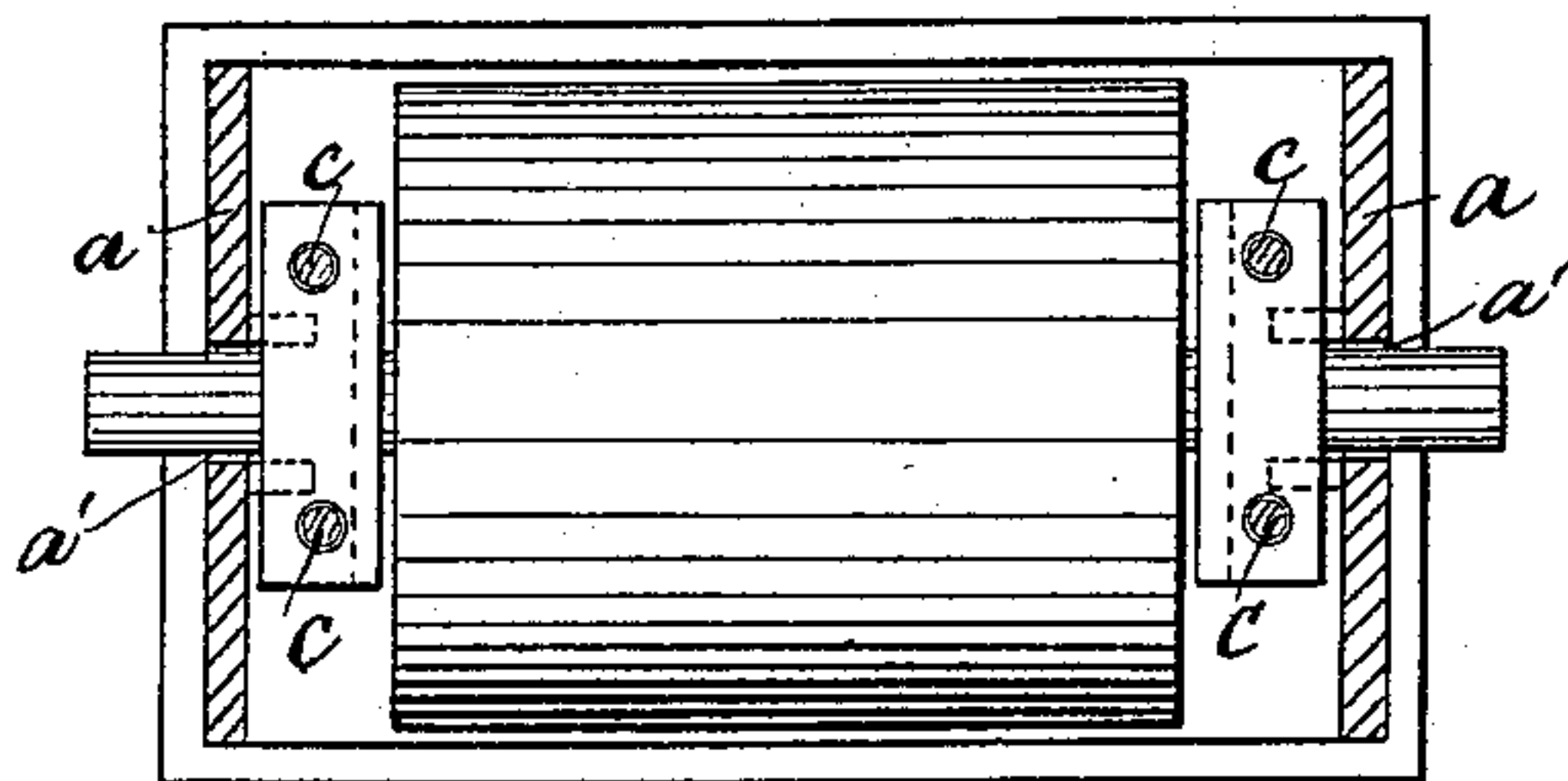
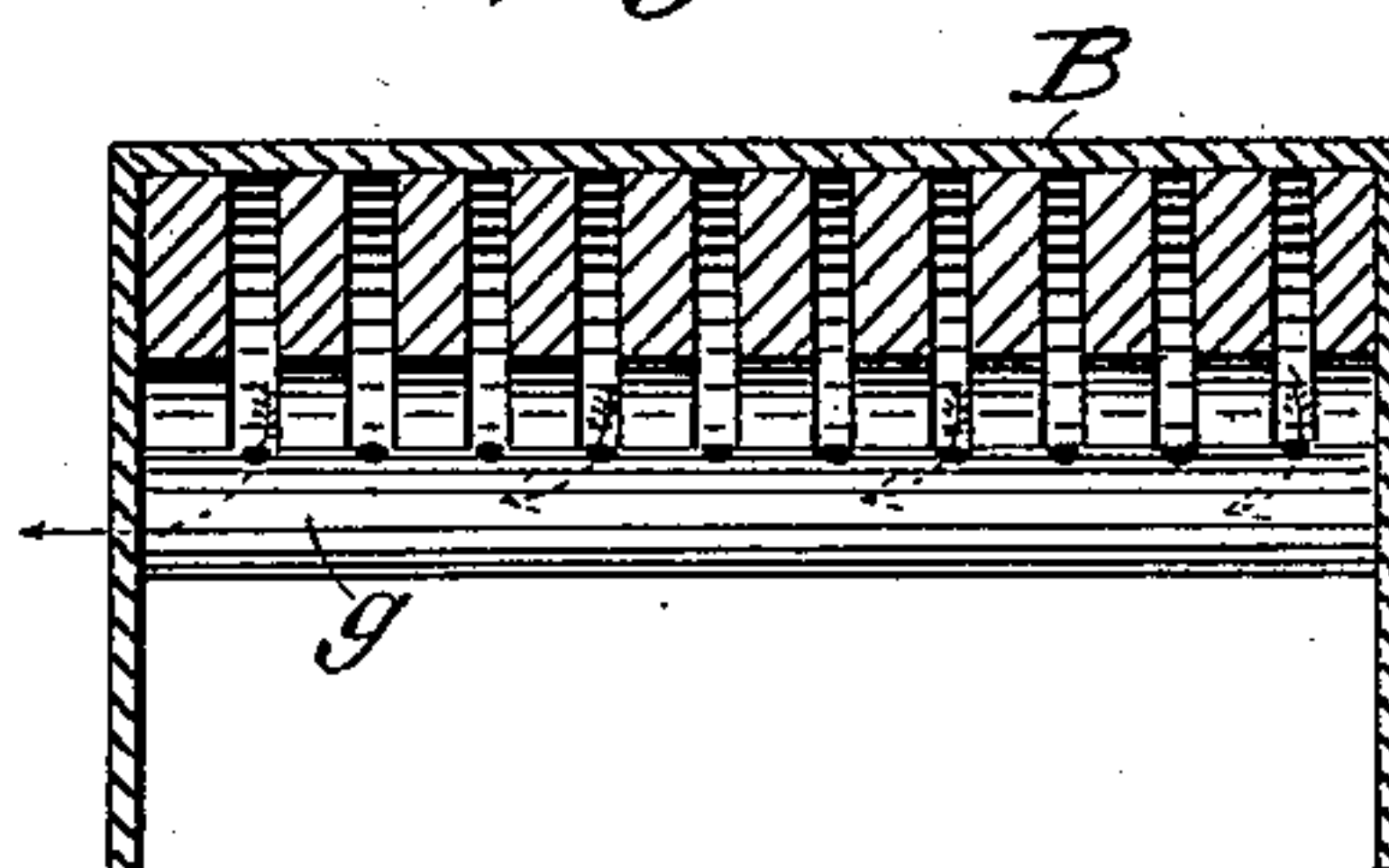


Fig. 4.



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JOHN BENNYWORTH, OF KINSLEY, KANSAS.

CANE-MILL.

SPECIFICATION forming part of Letters Patent No. 312,072, dated February 10, 1885.

Application filed May 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN BENNYWORTH, of Kinsley, in the county of Edwards and State of Kansas, have invented a new and useful
5 Improvement in Cane-Mills, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate
10 corresponding parts in all the figures.

Figure 1 is a vertical transverse section of a mill of the improved construction. Fig. 2 is a rear elevation of the mill, and with the frame partly broken away. Fig. 3 is a horizontal section. Fig. 4 is a horizontal section
15 of one of the hoods on the line $x x$ of Fig. 1, looking downward, and having plainly the bars of the hood and the apertured escape-pipe.

20 The frame of the mill consists of side standards, $a a$, rising from a sill, b , the standards being divided or slotted vertically, as at a' , to receive the journals of the rolls A and allow their vertical adjustment. Between the ends
25 of the rolls and the standards are rods or posts $c c$ that are fixed firmly to the sill b and pass through the boxes d of the journals, whereby the latter are prevented from twisting, but are free to slide on the posts. This allows the
30 rolls to separate more or less, according to the material passing through, and insures the distribution of the pressure on the cane and the relief of the journals from the weight. The upward movement is limited by nuts e on the
35 posts, and there may be springs between the nuts and boxes, if desired. There may be four rolls, as shown, with the result of three rollings of the material, or six rolls, which would give five rollings. At alternate sides
40 of each roller, except the upper and lower one, is fixed a steam jacket or hood, B , which covers that side of the roller, so that the hood serves also as a means of guiding the cane downward and through the space below. The
45 said jackets are on opposite sides, as shown in Fig. 1. Each hood or jacket is of curved form, with a supply steam-pipe, f , at the top, and outlet steam-pipe, g , at the bottom, and is formed with vertical bars h that form pockets
50 for the steam and also press the cane to the roller. These bars h extend from the inner face of the hood, as shown in Figs. 1 and 4,

and are curved on their edges so as not to obstruct the passage of the cane. The cane is pressed in its passage between the rolls against
55 the curved edges of the bars, but does not enter between them, so that the steam and water have a clear passage through the pockets formed by said bars. Between the bars the pipes $f g$ are perforated for the steam to pass. 60
Upon the upper end of the jacket is a scraper, i , that removes the material from the roller above and directs it downward. This construction allows the steam and water to come
65 in direct contact with the cane, and insures a constant entry of live steam into the jacket. l is a perforated pipe at the upper part of the hood for supplying hot water at that point for washing out the saccharine matter. $m m$ are
70 the feed-rollers. nn are the juice-tables; and o is a table for delivering the bagasse to a carrier.

It is to be observed that the cane, after receiving its first rolling between the first and second rolls, passes then between the steam-jacket and the second roll, where the steam
75 and water saturate it. It then goes beneath the second roll, where it is further crushed, and in passing the second steam-jacket the side presented to the action of the steam is
80 the opposite one to that presented to the steam before. The rollers being free to adjust themselves, the pressure is distributed and the weight of the rolls is utilized in the operation.

It will be seen from Fig. 1 that the journals of the lower roller have a bearing, as at a^2 , in
85 lower ends of the slots a' , to prevent the lowest roller from touching the base b . In the last rolling the weight of three or four rolls, amounting to tons, comes upon the cane, thereby insuring the thorough expression of the
90 juice while relieving the journals of the friction and wear. This is due to the fact that the rollers above the lowest are free to move downward to rest on each, and their combined weight thus bears on the cane in passing be-
95 tween the two bottom rollers. By this arrangement of the hoods and rollers a continuous S-shaped passage is formed, as shown in Fig. 1. The escape of the steam from the outer or return jacket may be regulated by a
100 valve, so as to obtain a pressure which will hold the cane against the roll.

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

1. The combination, with the vertical series of rollers A, of the steam-hoods B, arranged on opposite sides of the intermediate rollers to form a continuous S-shaped passage, whereby the cane will be guided between the lower and upper surfaces of the first and second rollers, thence between the lower and upper surfaces of the second and third rollers, and so on back and forth between the successive rollers, as described, to the end of the series, substantially as set forth.

2. The combination, with the rollers A, of the hoods B, arranged on opposite sides of the intermediate rollers, as shown, and a series of bars, *h*, extending from the inner surfaces of said hoods to form guides for the cane in its passage between the rollers, and also to form pockets between said bars, substantially as and for the purpose described.

3. In a cane-mill, a steam-jacket, B, formed with a series of bars, *h*, extending from its inner surface, as shown, to form guides and pockets, and a supply and exhaust pipe connected with each of said pockets, substantially as set forth. 20

4. In a cane-mill, the combination of the rollers A, one above the other, vertically-slotted standards *a*, vertical posts *c*, secured on opposite sides of each slot, and the sliding boxes *d* on said posts *c*, substantially as set forth, whereby the journals of rollers A may freely slide within the slotted standards and be prevented from lateral movement. 25 30

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Witnesses:

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