

D. M. COOK.

Cane Mill.

No. 39,467.

Patented Aug. 11, 1863.

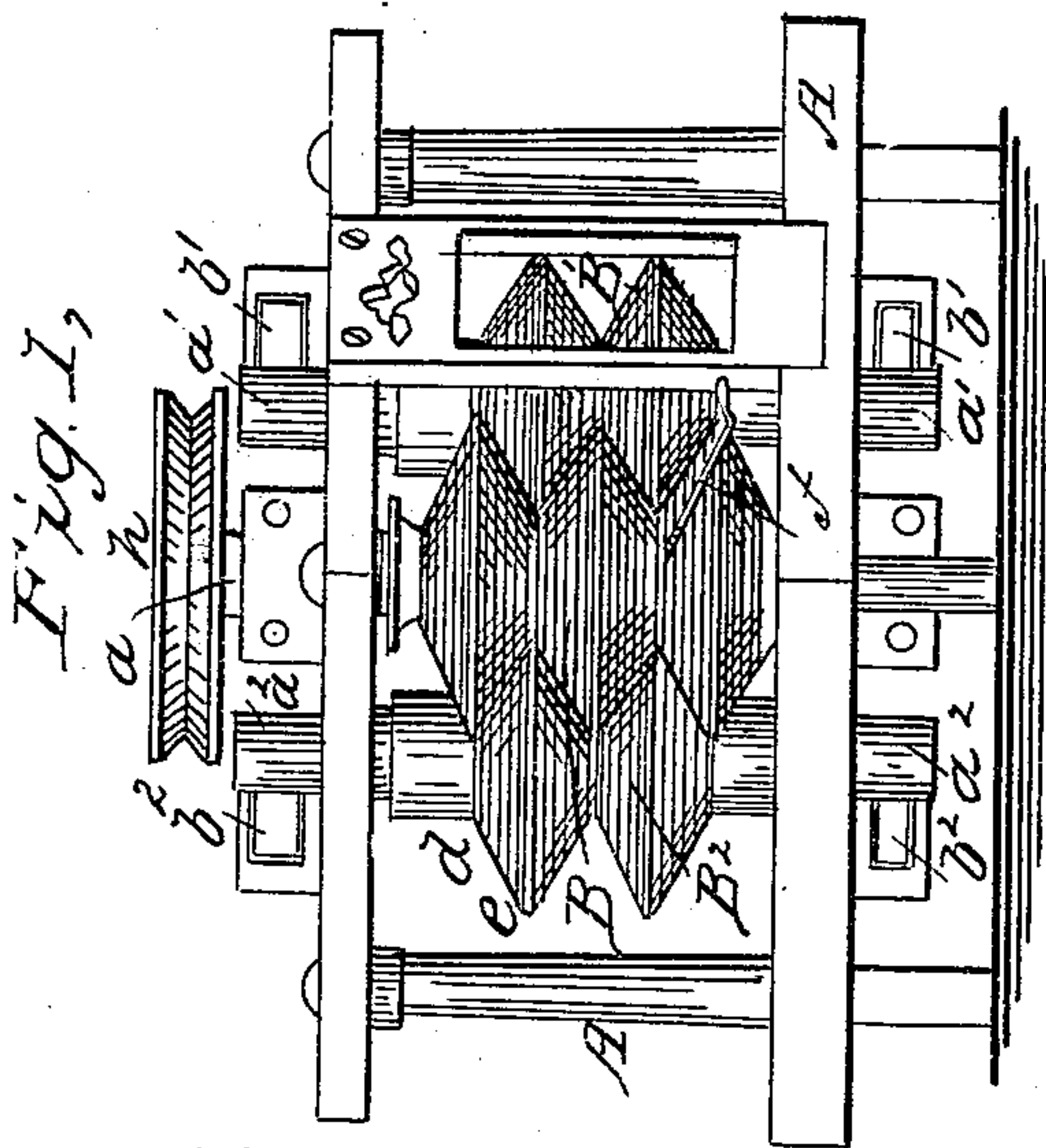
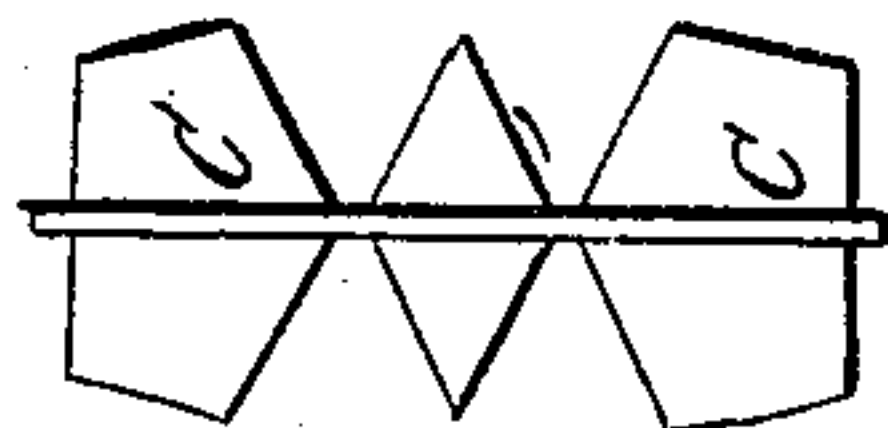
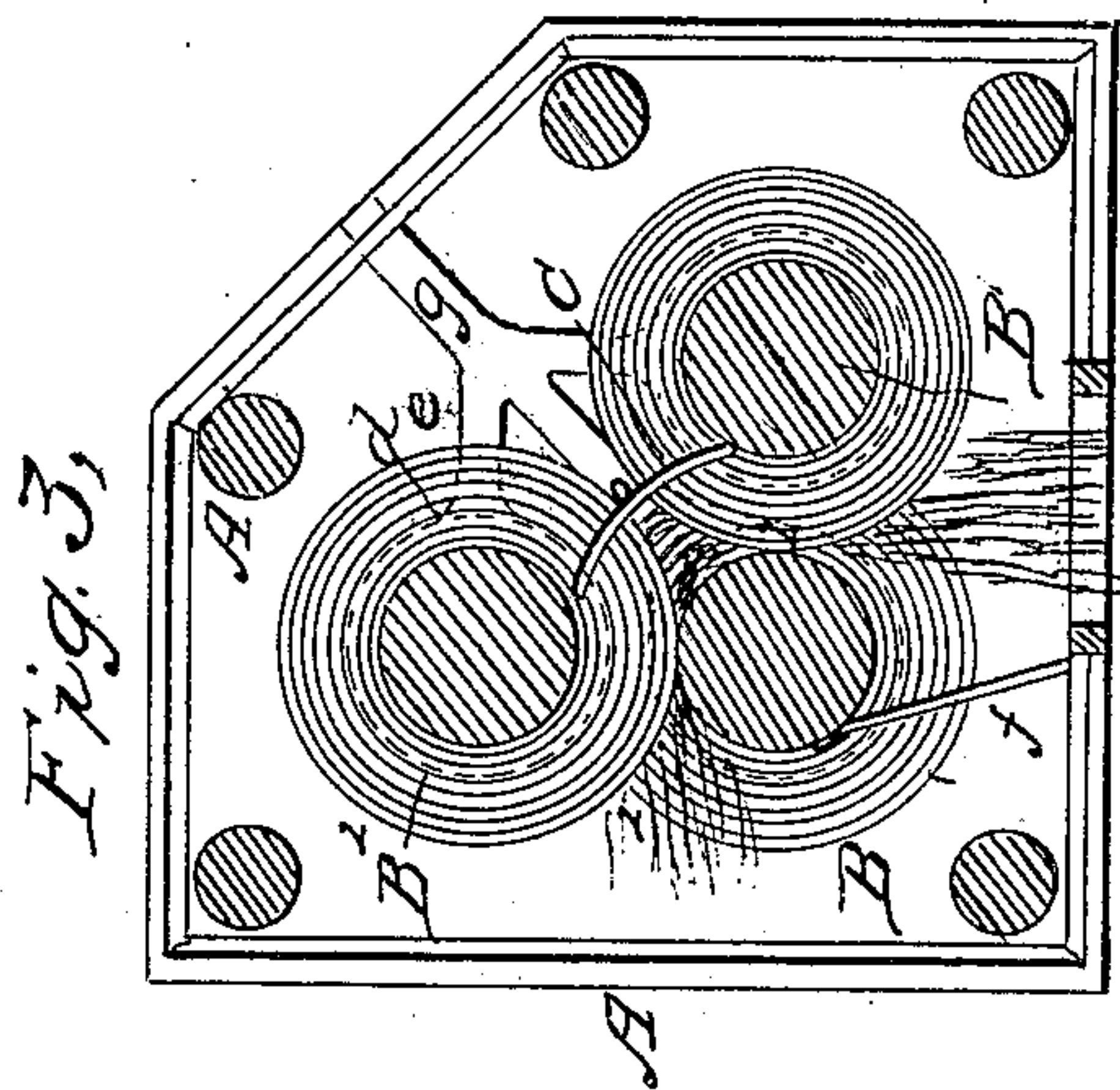
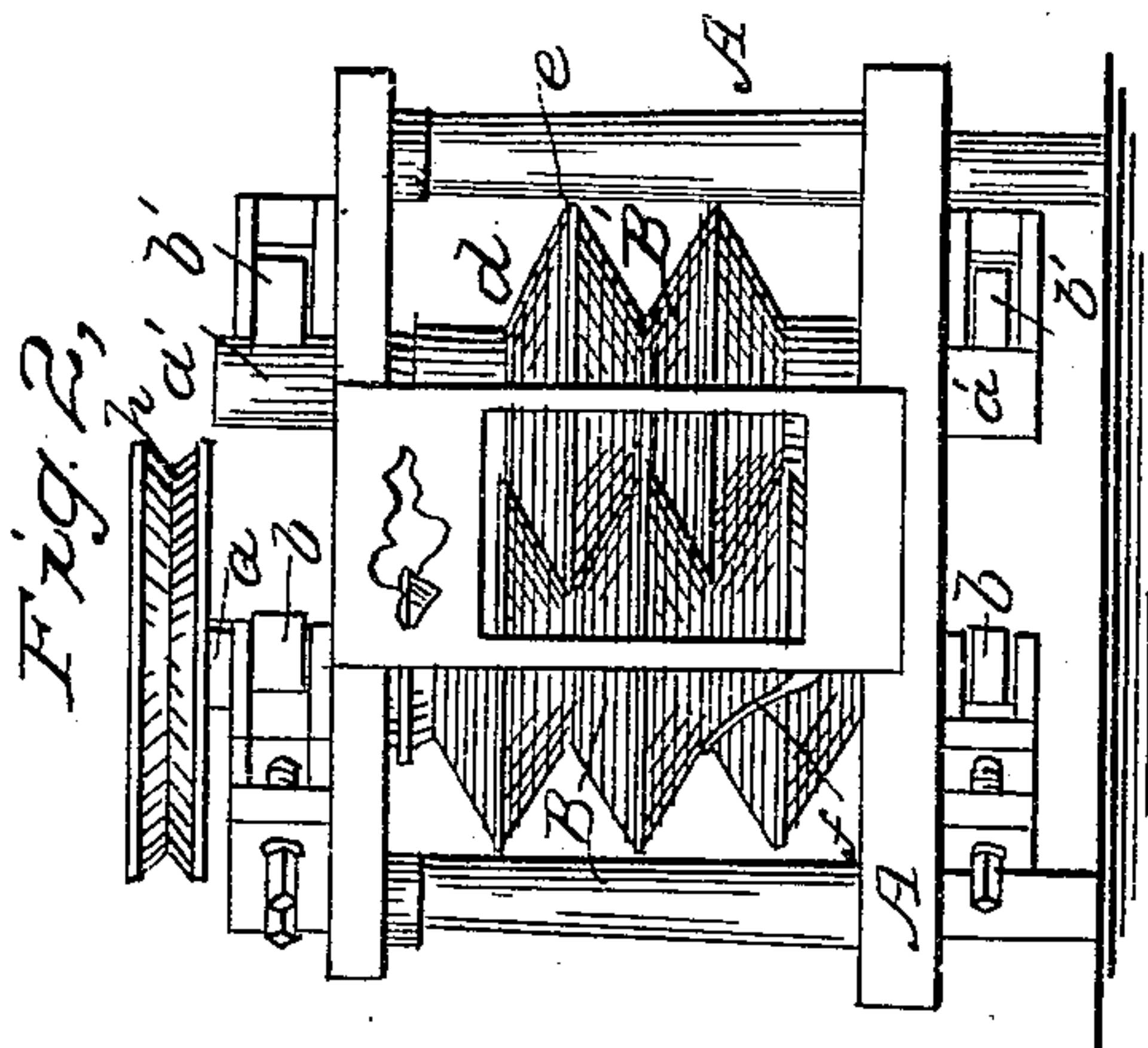
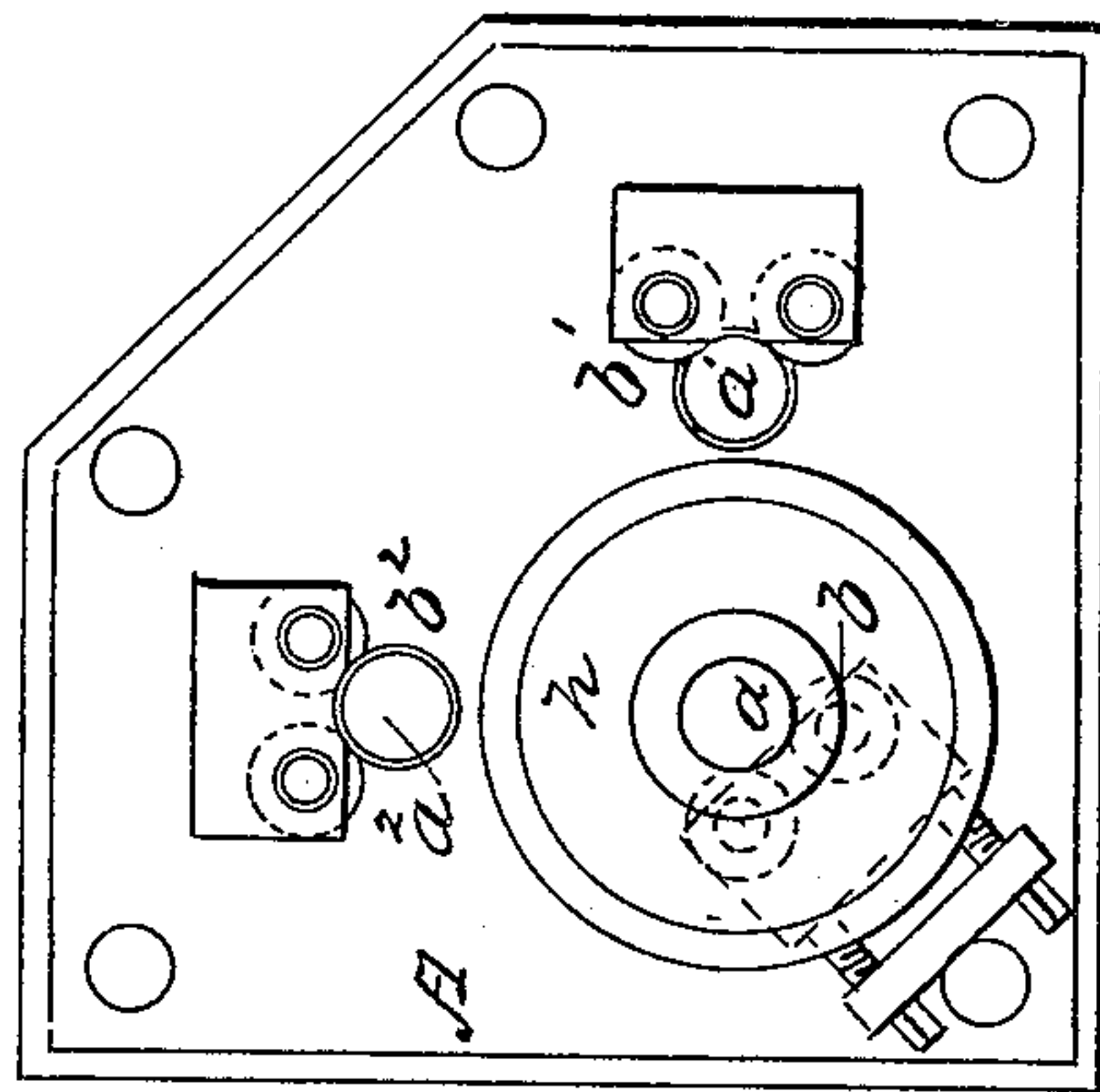


Fig. 4,



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UNITED STATES PATENT OFFICE.

D. M. COOK, OF MANSFIELD, OHIO.

IMPROVEMENT IN CANE-MILLS.

Specification forming part of Letters Patent No. 39,467, dated August 11, 1863.

To all whom it may concern:

Be it known that I, D. M. COOK, of Mansfield, in the county of Richland and State of Ohio, have invented a new and useful Rotary-Wedge Cane-Mill; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of the mill from one of its corners. The corner-post is removed. Fig. 2 is a front view of the same. Fig. 3 is a horizontal section of the same. Fig. 4 is a top view of the same.

Similar letters of reference in the several figures indicate corresponding parts.

The nature of my invention consists in a cane-crushing mill whose rollers are constructed with crushing-surfaces of circular wedge form, the circular wedges of one or more of the rollers matching and revolving in wedge-shaped spaces between the circular wedges of the other roller in such manner as to present large crushing-surfaces, which act to splinter the rind of the cane and expose the pith, so that the juice is expressed from the latter without at the same time forcing out all the bitter albuminous and coloring matter of the rind, the said surfaces also inducing sufficient friction to insure the revolution of the rollers without the use of intermediate cog or belt gearing, if found necessary.

Cane-mills as usually constructed flatten the cane-stalk in such a manner that the pulp is only acted upon through the rind, and it is difficult to rupture all the cells and liberate the pure juice without at the same time forcing out all the bitter albuminous and coloring matters in the rind. The form of rollers I use splinters the cane before it (the cane) is crushed, and the splinters being thrown apart or displaced by the contrary movements of the broad drawing, twisting, and crushing surfaces of the rollers, the pith comes into immediate contact with the face of the circular wedges of the rolls, and the juice is liberated without subjecting the cane to the ordinary violent pressure. The circular wedges of the crushing-rollers also greatly reduce the friction on the journals, from the fact that the resistance of the cane being crushed is met by surfaces which are tending, by reason of such

resistance, to hold the shafts of the rollers vertical or in a balance, instead of wholly forcing them (the shafts) apart laterally.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

Within a frame, A, which has open sides, a solid top, and a solid bottom, with flange around its upper edge, I arrange three crushing-rollers, B B' B², in an upright position on a triangle, as represented. The journals *a a' a²* of the rollers revolve in circular apertures cut through the top and bottom of the frame, and have their lateral support from friction-rollers *b b' b²*. The intermediate roller, B, has its supports adjustable by means of set-screws, so that the space for the introduction of the cane may be regulated. To accommodate this adjustment the journal-apertures for this roller may be slightly enlarged in one direction. Between the rollers B' B², and in rear roller of the B, a vertical director, C, is arranged. This director just fits and matches the profile of the crushing-rollers. By it the cane-stalks that enter at 1 are compelled to come out at 2, as illustrated, and thus they are subjected to a double crushing action before they escape. The crushing-surfaces of the rollers commence at *d* and terminate at *e*. The horizontal or plan view of these surfaces is circular. The vertical or elevation view of them presents a wedge from the whole of their circumference. These crushing-surfaces might be better understood by stating that every roller is made up of a series of flattened cones, the bases of every pair of which meet at the circumference of the roller, while the apexes meet on the shafts of the rollers. Between every pair of wedges a space corresponding in form with the wedge exists. Into this space the wedge of another or two other rollers fits, as shown. The fit should be very snug, so that friction between the wedges of the respective rollers shall be induced, and thus all be caused to revolve in opposite directions from one driving-pulley. Gearing between the shafts of all the rollers might, however, be used to advantage under some circumstances.

The circumference of the wedges may be made blunt, and the groove at the point where

the same fits may be of corresponding form, but on a concave, so that large and small stalks may be accommodated.

The crushing-surfaces might be ridged or corrugated circularly or otherwise, as represented, so as to take hold upon the cane-stalks more effectually. The adhering pulp on the surfaces is removed by a stationary scraper or scrapers, *f*, as shown. In practice it might be found advantages to cover the surfaces with vulcanized india-rubber, so that the splintering of the cane may be effected and the expressing of the juice also without any danger of crushing the rind in any of its parts. The juice in flowing down is contained within the flange of the bottom, and is conducted off by the channel *g* into a receiver.

The cane, in being fed to the rollers, is guided by means of a perforated plate, tube, or other suitable device.

I contemplate employing my rollers with wedged crushing-surfaces in horizontal mills. In all cases the angle of the wedges should be proportionate to the diameter of the rollers.

It is obvious that as the cane is introduced between the pairs of bevel surfaces, such surfaces revolving in reverse directions, it will be drawn and twisted in a manner to have its rind splintered, and while this is the case the

pressure upon it causes the exposed pith to liberate its juice. It also obvious that the lateral thrust upon the journals of the rollers is deflected by the angle of the crushing-surfaces, and, finally, that the friction of the surfaces upon one another insures a rotation of all the rollers, although only one is positively driven from the pulley *h*.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The matching circular wedges arranged on and constituting the splintering and expressing surfaces of a roller cane-mill, substantially as and for the purposes set forth.

2. A roller cane-mill constructed to operate upon the cane with the one series of interlocking rolls, in the manner set forth.

3. Splintering cane, expressing the juice therefrom, driving the ungeared rolls, and relieving the journals of the rolls by means of circular wedges, as set forth.

4. The combination of the rollers, director *C*, and scraper *f*, all constructed and arranged substantially as described.

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Witnesses:

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