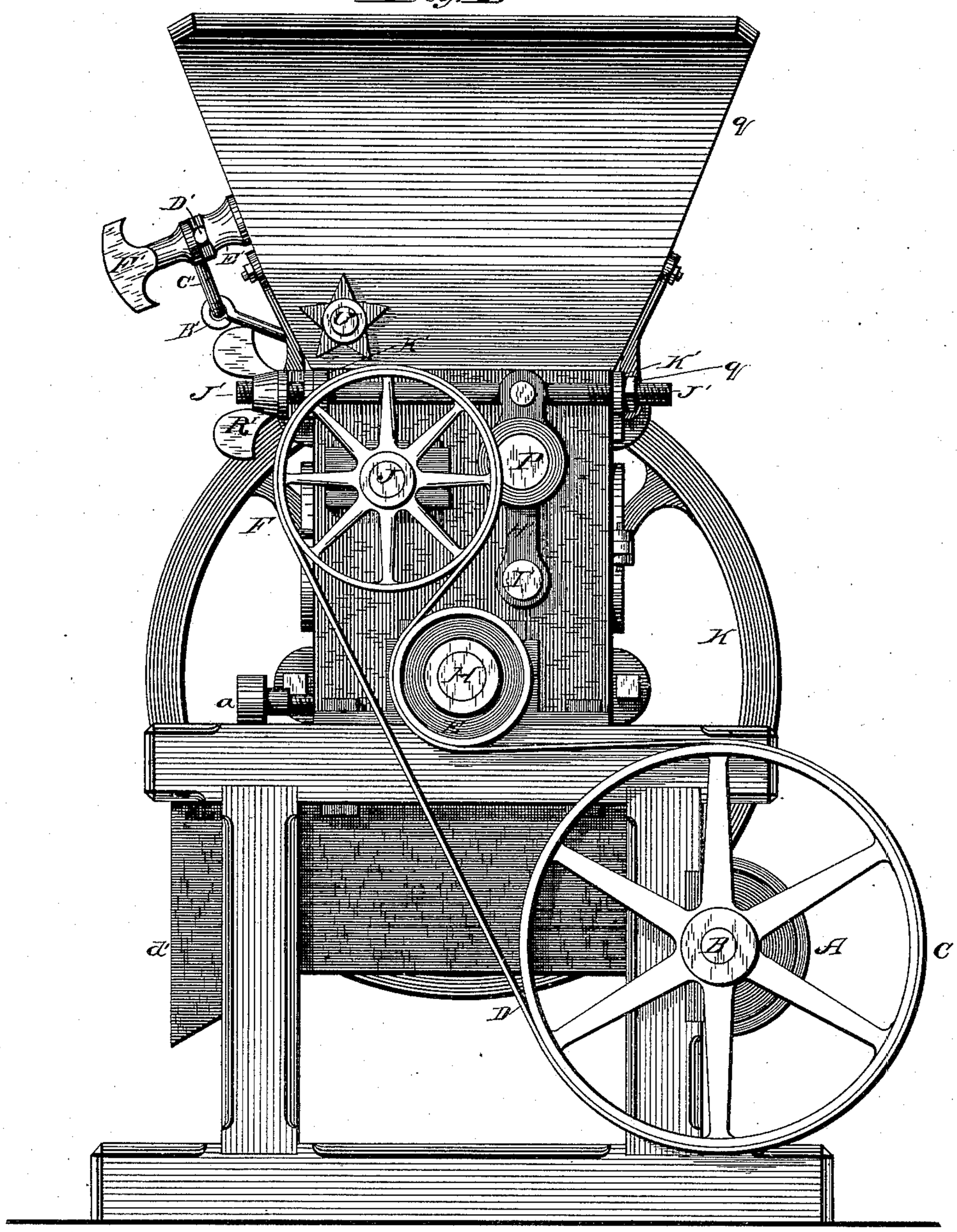
(No Model.) 5 Sheets—Sheet 1.

L. & E. IANKE.

FEED MILL.

No. 306,401. Patented Oct. 14, 1884.

Fig. 1.



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5 Sheets—Sheet 2.

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Fig. 2.

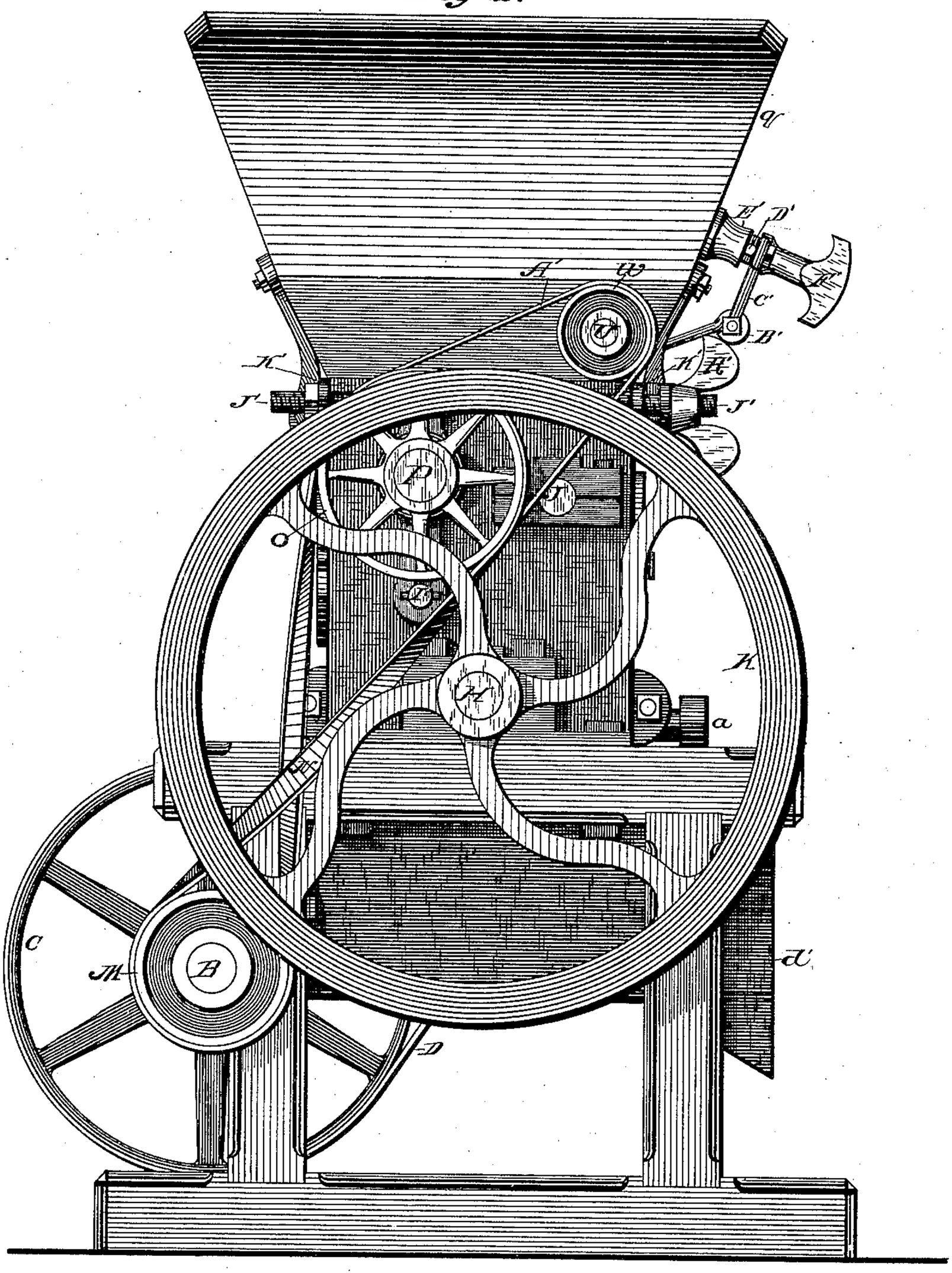

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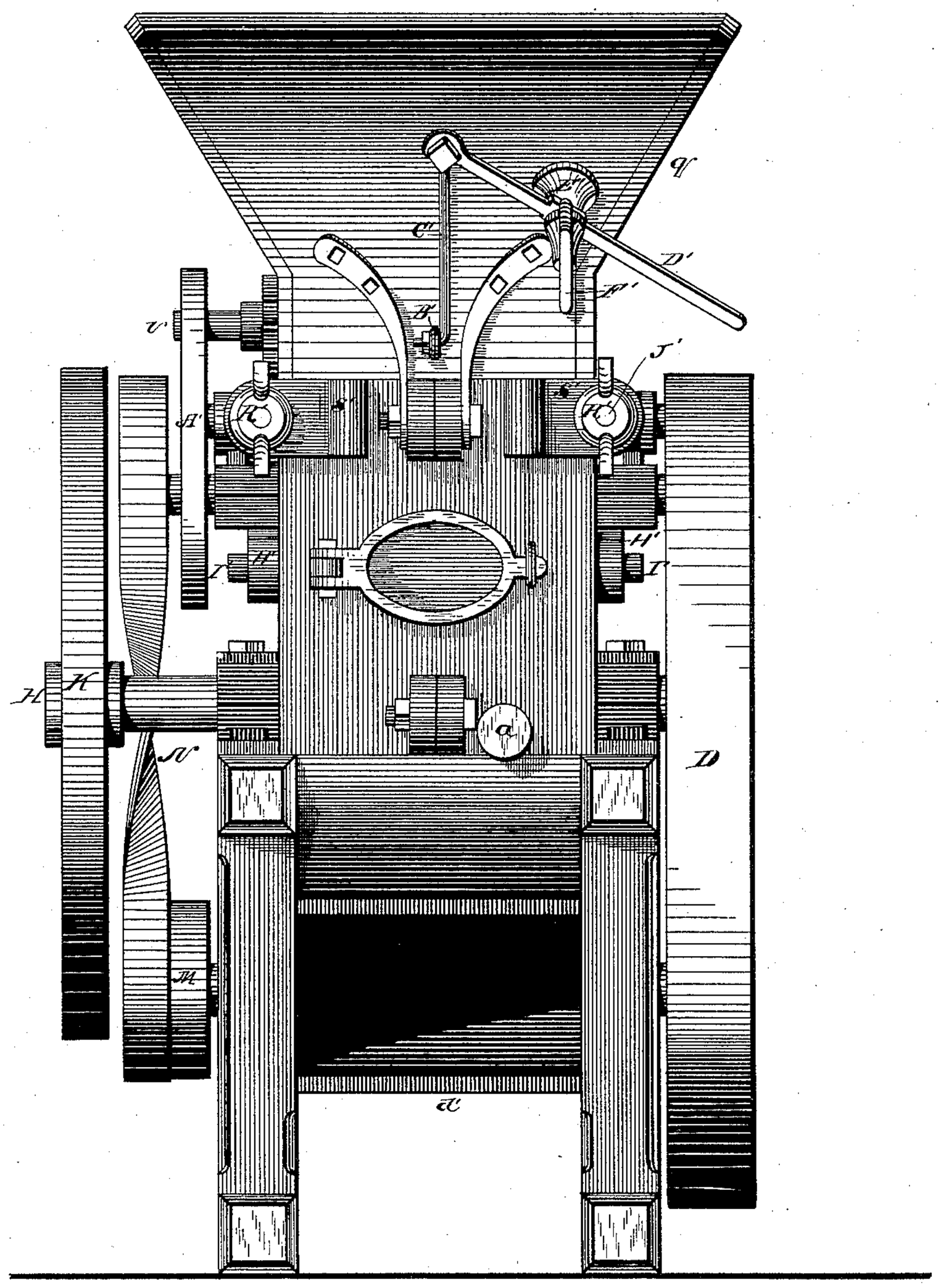
Fig. 3.



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5 Sheets—Sheet 4.

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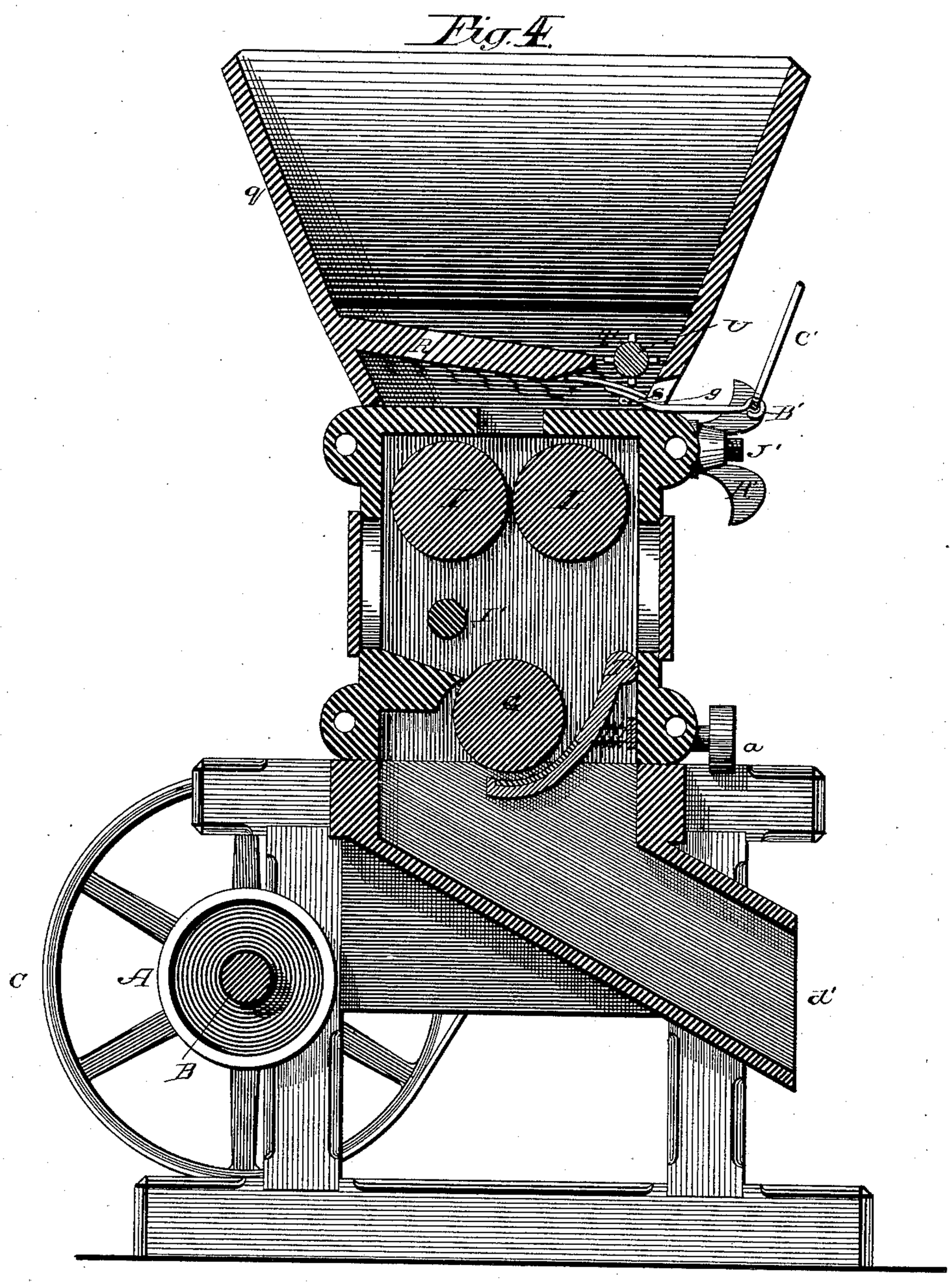
Fig. 4.



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(No Model.) 5 Sheets—Sheet 5.

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No. 306,401. Patented Oct. 14, 1884.

Fig. 5.

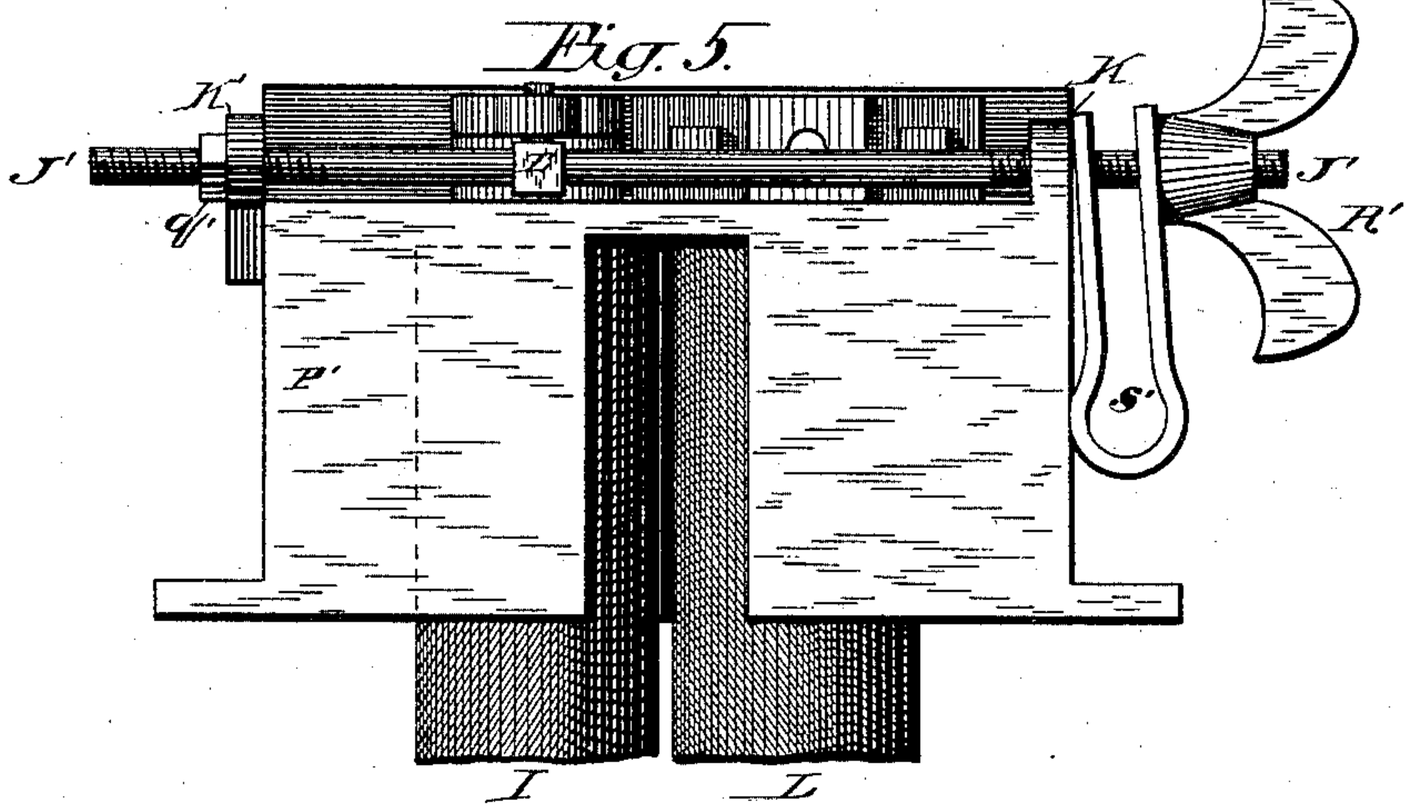
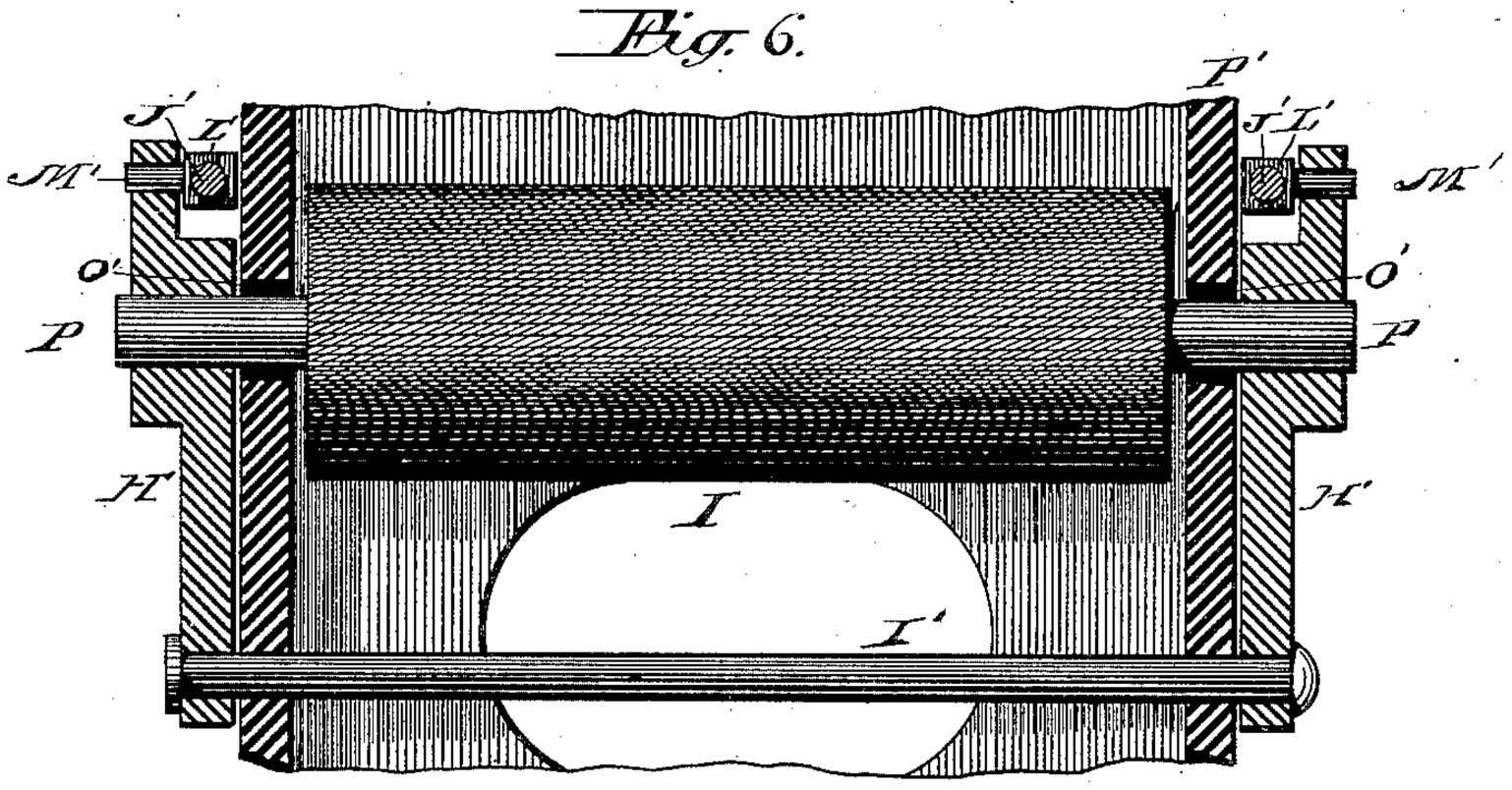


Fig. 6.



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UNITED STATES PATENT OFFICE.

LEOPOLD IANKE AND EMIEL IANKE, OF FREDONIA, WISCONSIN.

FEED-MILL.

SPECIFICATION forming part of Letters Patent No. 306,401, dated October 14, 1884.

Application filed March 24, 1884. (No model.)

To all whom it may concern:

Be it known that we, LEOPOLD IANKE and EMIEL IANKE, citizens of the United States, residing at Fredonia, in the county of Ozaukee and State of Wisconsin, have invented certain new and useful Improvements in Feed-Mills; and we 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 or figures of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in machines for grinding coarse feed, and the construction and operation of our machine are explained by reference to the accompanying drawings, in which—

Figures 1 and 2 represent opposite sides of our machine. Fig. 3 is a front view. Fig. 4 is a vertical section drawn transversely of the grinding-rolls. Figs. 5 and 6 are details.

Like parts are represented by the same reference-letters throughout the several views.

Motion is communicated to the machine from the motive power through a band operating on the pulley A, and from thence through the shaft B, pulley C, and belt D to pulleys E and F. Motion is communicated from pulley E to the lower grinding-roll, G, by shaft H, and from the pulley F to the upper grinding-roll, L, through shaft J.

To the end of the shaft H, opposite the pulley E, is a fly-wheel, K, by which a steady uniform movement of the machine is attained.

Parallel to the roll L is arranged another roll, I, which is adapted to revolve slower than roll L, whereby the grain is partially cut and ground by the action of the more rapidly revolving roll, as well as crushed between said rolls. Motion is communicated to the roll I from the pulley M upon the end of shaft B opposite the pulley C, as shown in Fig. 2, through the belt N, pulley O, and shaft P.

q is a hopper, into which the grain is placed preparatory to being ground. The bottom of the hopper is provided with a bottom board, R, inclining downward toward the front of the hopper, and an outward swinging door, S, by which the escape of grain from the hopper is governed.

The passage T is provided with an agitator, U, consisting of a cylindrical shaft provided with radial pins, which, as said shaft is rotated, loosens up the surrounding grain and causes it to be uniformly fed from the hopper. The projecting end of said agitator is provided with a pulley, *w*, to which motion is communicated from the edge of said pulley O by belt A′, or from another pulley on same shaft, as shown in Fig. 2. The door S is pivoted to the inclosing-case at its respective ends on pivots *g g*, and is operated by the lever B′, rod C′, and lever D′. The lever D′ is centrally pivoted upon the support E′, which support is attached to the side of the hopper. The projecting end of the support E′ is provided with a hand-nut, F′, by and between which and the support the lever is firmly held by turning down said nut, whereby the door S is held at any desired point of adjustment. The shaft of the roll I is supported at its respective ends in journal-bearings provided therefor in the upper ends of the swinging arms H′ H′. The lower ends of the arms H′ H′ are supported by the projecting ends of the shaft I′, while their upper ends are held in place and adjusted toward the right and left by the rods J′ J′. The rods J′ J′ are supported at their ends by the lugs K′ K′, through which they pass. The swinging ends of the arms H′ H′ are connected with said adjusting-rods J′ J′ by the blocks L′ L′ and trunnions M′ M′, as shown in Figs. 5 and 6, the rods J′ J′ passing through said blocks L′ L′, while the trunnions M′ M′ on said blocks are adapted to turn in their bearings in the upper ends of said arms as said arms are adjusted. Slots O′ O′ are provided in the inclosing-case P′ to permit of the required movement of the shaft P therein while adjusting the roll I. The ends of the respective rods J′ J′ are provided with nuts *q′ q′* and R′ R′.

Interposed between the hand-nuts R′ R′ and the case P′ are U-shaped or other forms of springs S′ S′, by which the rods J′ J′ are drawn forward with the upper ends of the swinging arms H′ H′, whereby the roll I is yieldingly held toward the roll L, as shown in Fig. 5.

To prevent the rolls I and L from coming in actual contact, and also to adjust them at various distances apart as may be required for grinding different kinds of feed, the nuts *q′ q′*

are provided upon the rear ends of said adjusting-rods J′ J′, which nuts *q′ q′* limit the forward movement of said rods and roll I. As said nuts *q′ q′* are turned forward and against the bearings of the case, the rods J′ J′ and the roll I are drawn back, and the space between said upper rolls increased as is required for grinding coarse feed, while the springs S′ S′ yield sufficiently to permit of the required adjustment.

When it is desired to adjust the rolls I and L nearer to each other for finer work, the nuts *q′ q′* are turned rearward, or toward the ends of the rods, whereby said rods are permitted to be moved forward by the action of said springs S′ S′, and carrying with them the roll I. The office of the springs S′ S′ is twofold, first, to draw said rods J′ J′ with the roll I forward, as mentioned, when the nuts *q′ q′* are loosened, and, second, to permit said roll I to move rearward automatically as may be required to permit stone or other foreign substances to pass between the rolls. The peripheries of the several rolls are grooved, forming serrated teeth or edges, as shown. The rolls I and L rotate inward toward each other, as indicated by the arrows, as mentioned, at differential rates of speed, whereby the feed is cut and crushed in its passage between them. When the feed is thus acted upon by the rolls I and L, it drops upon the concave surface of the serrated apron T′, when it is further acted upon by the grooved grinding-roll G. (Shown in Fig. 4.) The apron T′ is suspended at its upper edge upon pivotal bearings *w′ w′*, which extend through openings provided therefor in the inclosing-case. The lower end of said apron is curved partially beneath said roll G, terminating beneath its center, whereby the feed is readily discharged, when ground, over the edge of the apron. The apron T′ is retained at the desired point of adjustment relatively to the roll G by the adjusting-screw *a* operating through the side of the case in a fixed nut, *b*.

Interposed between the inner end of the screw *a* and the apron is a spiral spring, *d*, the tension of which is sufficient to communicate the desired pressure from said screw to said apron for grinding purposes, while it will yield sufficiently to let a stone or other foreign substances pass between the roll and the apron, the apron being adjusted more closely to the roll for fine grinding by turning said screw *a* inward and less closely by a reverse movement of the screw. In case the first reduction made by the rolls I and L is sufficient, the screw *a* may be withdrawn, when the feed will fall past the apron to the bottom and out through the chute *d′* without being acted upon by the roll G.

There are various parts shown and described which are not of our invention, and only appear to show their operative connection or arrangement in the machine used by us. Our invention is fully set forth in the claims.

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

1. The combination of the hopper *q*, bottom R, agitator U, door S, said door having pivotal supports *g g* at its respective ends, lever B′, rod C′, lever D′, supporting-screw E′, and hand-nut F′, said hand-nut being adapted to rigidly retain said door at any desired point of adjustment, as set forth.

2. In a feed-mill, the mechanism for adjusting the movable roll, consisting in the combination of its shaft, the swinging arms H′ H′, pivotal support I′, trunnions M′ M′, blocks L′ L′, adjusting-rods J′ J′, adjusting-nuts *q′ q′* and R′ R′, and springs S′ S′, as set forth.

3. In a feed-mill, the combination of stationary roll L, with adjustable roll I, shaft P, arms H′ H′, supporting-rod I′, trunnions M′ M′, blocks L′ L′, rods J′ J′, springs S′ S′, and nuts *q′ q′* and R′ R′, as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

LEOPOLD IANKE.
EMIEL IANKE.

Witnesses:
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HENRY CALTE.