(No Model.) 3 Sheets—Sheet 1.

J. WARRINGTON.

ROLLER MILL.

No. 312,048. Patented Feb. 10, 1885.

Fig. 2.

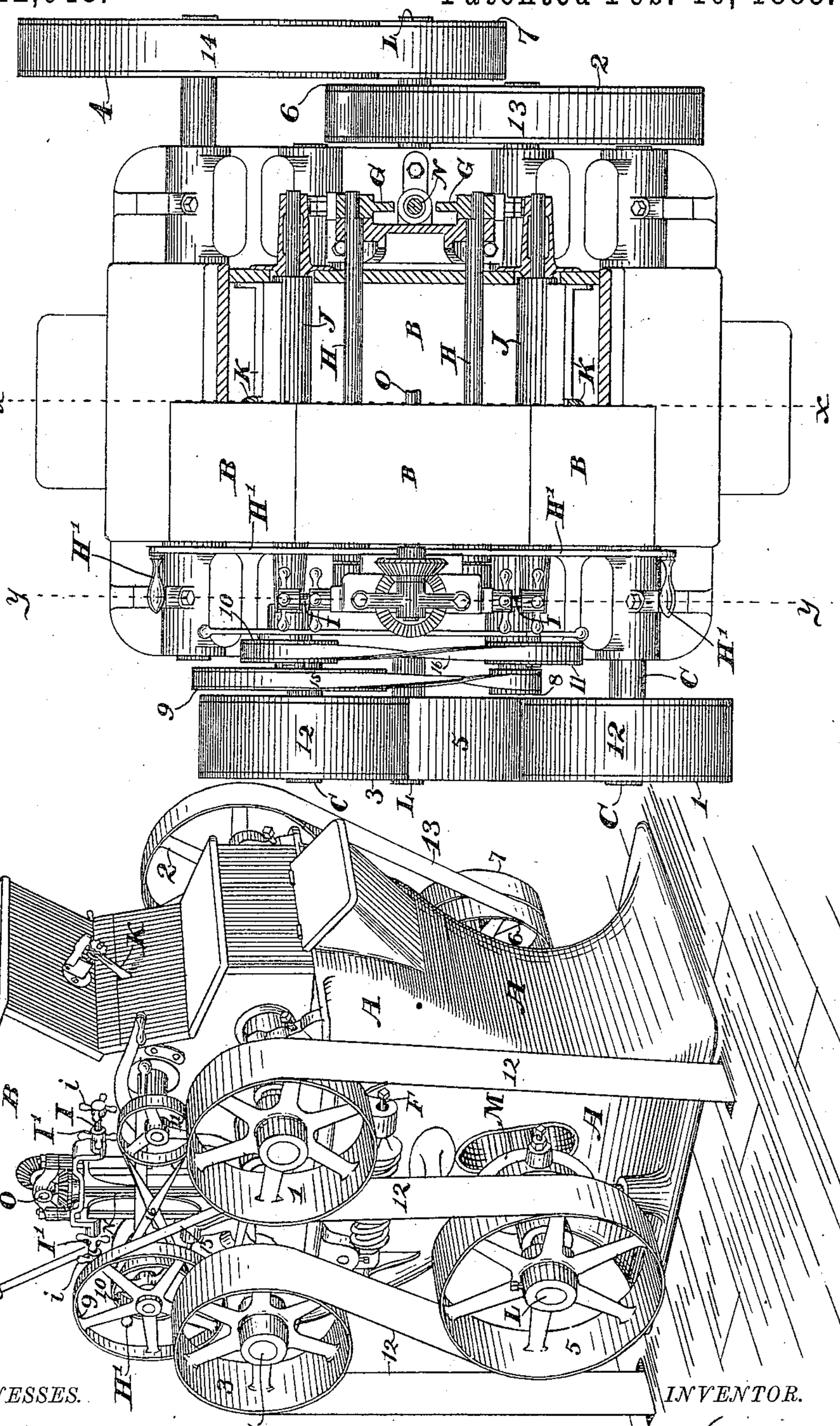

Fig. 1.

WITNESSES.

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Fig. 3.

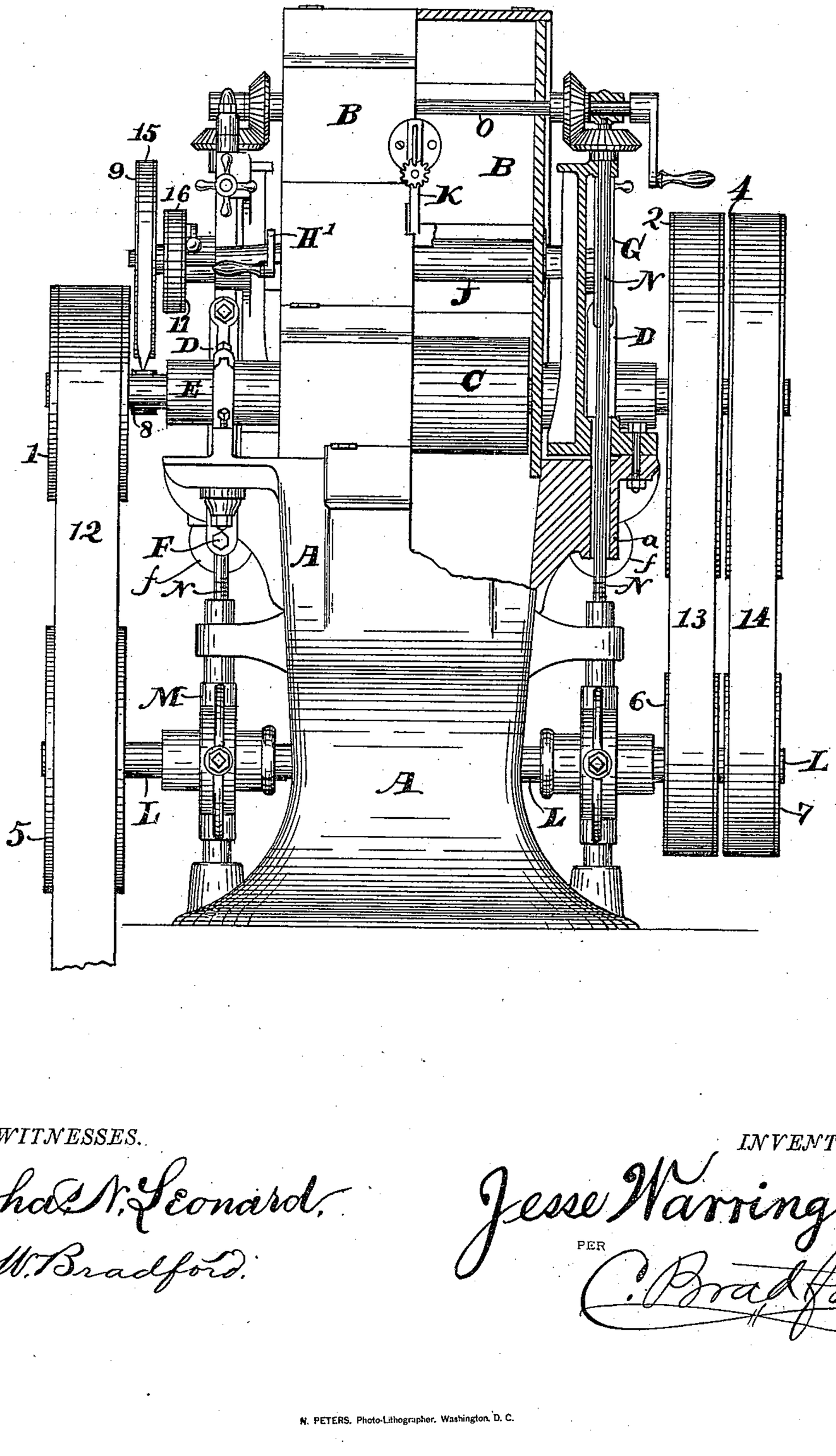

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Fig. 4.

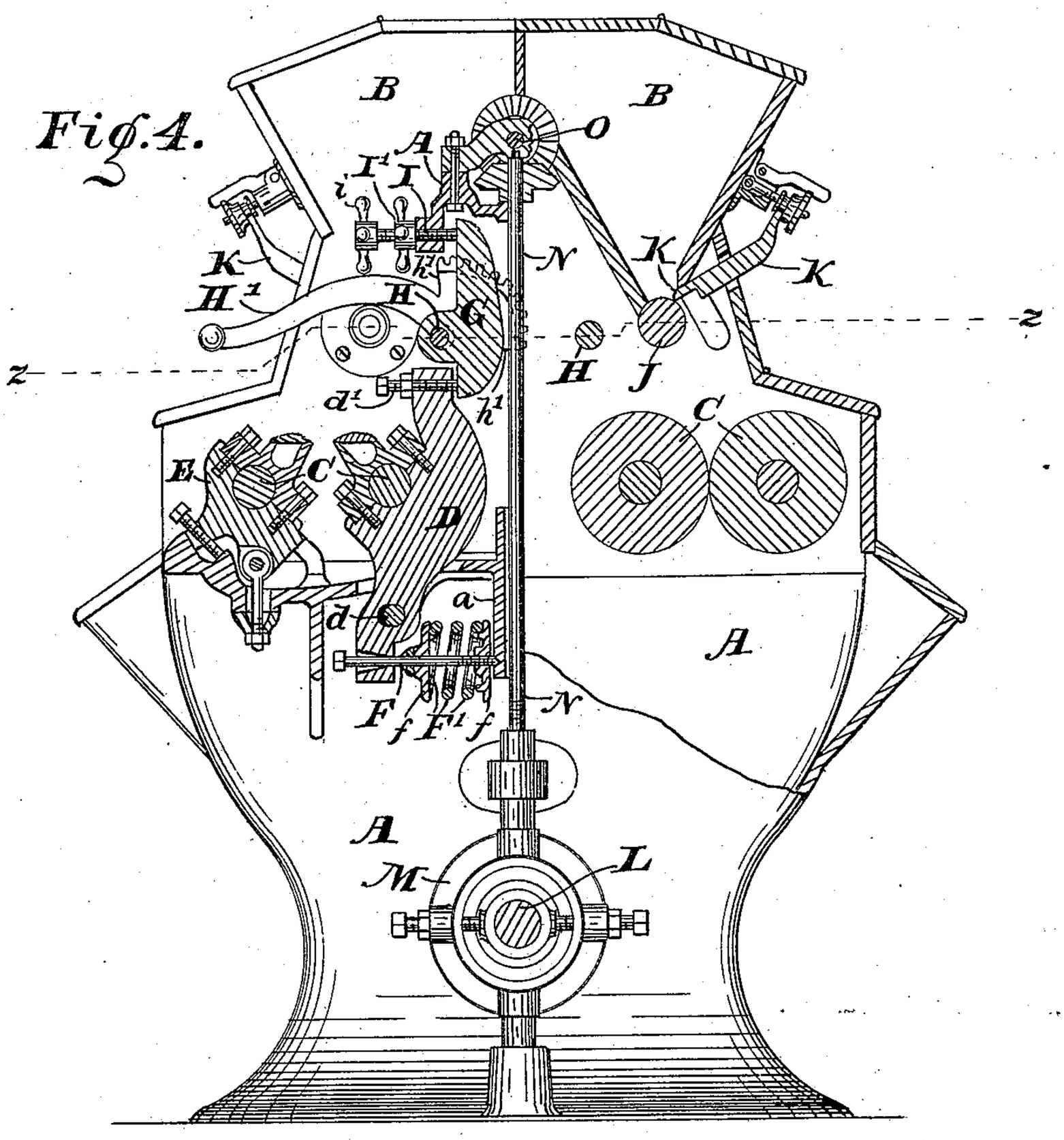
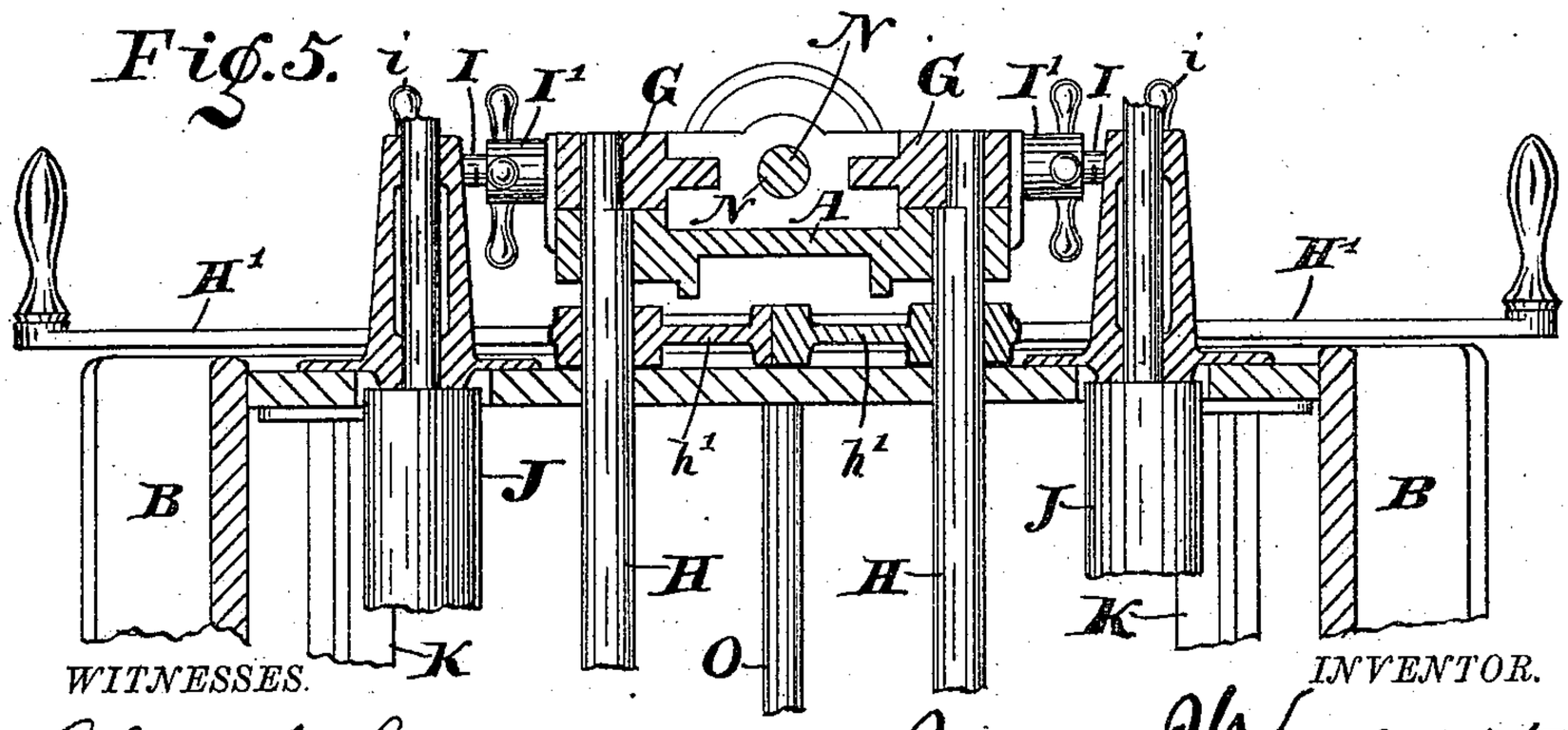


Fig. 5.



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UNITED STATES PATENT OFFICE.

JESSE WARRINGTON, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE NORDYKE & MARMON COMPANY, OF SAME PLACE.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 312,048, dated February 10, 1885.

Application filed February 23, 1884. (No model.)

To all whom it may concern:

Be it known that I, JESSE WARRINGTON, of the city of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Roller-Mills, of which the following is a specification.

Said invention relates to that class of machinery for the reduction of grain known as "roller-mills," and is especially applicable to the style of mills illustrated in the Letters Patent of the United States issued to the Nordyke & Marmon Company, No. 274,508, dated March 27, 1883, and No. 277,525, dated May 15, 1883, being two of the patents referred to.

My present invention principally consists in an improved mechanism for operating the rolls, whereby mechanism necessary to other constructions is dispensed with and a great degree of strength and rigidity secured, and in changes in the construction and arrangement of the roll-supporting parts incident thereto.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a perspective view of a mill embodying my said invention; Fig. 2, a view, partly in top plan and partly in horizontal section on the dotted line *z z* in Fig. 4, of the same; Fig. 3, a view partly in front elevation and partly in section on the dotted line *x x;* Fig. 4, a sectional view taken partly on the dotted line *y y* and partly on the dotted line *x x* in Fig. 2; and Fig. 5, a view on an enlarged scale, looking upwardly from the dotted line *z z*.

In said drawings, the portions marked A represent the supporting frame-work of the mill; B, the hopper and other covering portions; C, the grinding-rolls and their shafts; D, swinging arms, in which one of each pair of rolls is mounted; E, adjustable boxes mounted on the frame-work in which the other rolls are mounted; F, tempering rods or screws for adjusting the maximum force of the grinding-pressure; G, a lever through which the swinging arms are operated; H, cam-rods whereby said levers are operated; I, distance or adjusting screws against which the upper ends of said levers rest and whereby their position is determined; J, the feed-rolls; K, the feed-gates; L, a counter-shaft; M, adjustable devices wherein the boxes for said shaft are mounted; N, rods whereby said devices are adjusted; O, a shaft whereby said rods are connected and adapted to be operated simultaneously, and the numerals 1 to 16, inclusive, the several pulleys and belts by which the machine is driven.

The frame, the hopper, the rolls, the feed-rolls, the counter-shaft, the adjustable devices therefor, the rods and shaft by which the same are adjusted, and the pulleys and belts by which the machine is driven are all similar to those shown in the Letters Patent hereinbefore referred to, and will not, therefore, be further described herein, except incidentally in describing the features of this invention.

The feed-gates K, while, as I believe, a new construction, are not of my invention, and are not, therefore, particularly described or claimed herein.

The swinging arms D are generally similar to the corresponding arms described in the Letters Patent before referred to, but are arranged to support the inner rolls of the sets instead of the outer rolls. They are adapted to their changed positions by slight changes of form. As they are not intended to support the adjustable boxes in this construction of mill, they may form a part of the boxes for the rolls, as shown. Said arms are supported by the pivots *d*, as in said other inventions, and preferably have adjustable stop-pins *d'* in their upper ends, against which the levers G rest.

The adjustable boxes E are similar in general form to those shown in the Letters Patent No. 277,525, before referred to, except in the substitution of a screw for a wedge; but, instead of being mounted on the swinging arms D, are mounted directly on the frame A, and support the outer rolls of the sets. This transposition, while it, as indicated in the specification of the Letters Patent No. 274,508, has been in contemplation for some time, has not before been satisfactorily accomplished, as so long as the arms supported the outer rolls it was difficult to devise a plan by which convenient access could be had to the means

of adjustment of these boxes, unless placed on said arms. The tempering-rods F are similar to those shown in the patents before referred to, except that certain changes corresponding to the altered position of the swinging arms have been made. The stops or lugs *a* on the frame, against which they bear, are now at or near the center of the frame, instead of near the side, and the springs F′ are now interposed between the nut-washers *f* and the loose washers *f′*, located on said rods between the swinging arms and the stops *a*, instead of beyond the stops, as before. The levers G are mounted on the cam-rods H, and serve as means of operating the swinging arms D, which, or the stop-pins *d′* therein, rest against their lower ends. At their upper ends these levers come in contact with and their position is regulated by the distance or adjusting screws I. The cam-rods H extend through from end to end of the machine, and sustain and are adapted to operate the levers G, being given a cam formation at the outer ends, on which said levers are mounted, as shown most plainly in Figs. 5 and 2. Upon these rods are handles H′, which extend out to the sides of the machine, where they can be conveniently reached by the operator, as shown.

When the parts are arranged as shown, the grinding-rolls are brought together in grinding relation by moving these handles to the position they occupy in the drawings, and said rolls are thrown apart by raising the handles to the position shown by the dotted lines in Fig. 3. The inner ends, *h′*, of these handles are preferably formed into toothed segments, which engage with each other, whereby both cam-rods can be operated from either side of the machine.

The distance or adjusting screws I are inserted through suitably-formed bosses on the upper portion of the frame A and rest against the upper ends of the levers G. As will be readily understood, these screws can be operated to adjust the position of said levers, and through them the position of the swinging arms D. These screws have arms *i* on their ends, by which they can be operated, and are provided with hand set-nuts I′, by which they are secured from turning after being adjusted to position.

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

1. The combination, in a roller-mill, of the rolls, swinging arms carrying one roll of the pair, levers for operating said swinging arms, and a cam-rod on which said levers are mounted and whereby they are operated, said cam-rod being provided with an appropriate handle, substantially as set forth.

2. The combination, in a roller-mill, of the rolls, swinging arms carrying one roll of a pair, levers for operating said swinging arms, a cam-rod on which said levers are mounted, and a handle for operating said cam-rod, said handle having a segmental extension, *h′*, whereby a second set of mechanism may be operated simultaneously with the first, all substantially as shown and specified.

3. The combination, in a roller-mill, of the rolls, swinging arms carrying the same, levers for operating said swinging arms, and distance or adjusting screws for determining the position of said levers, substantially as set forth.

4. The combination of the grinding-rolls, the adjustable boxes attached to the frame-work and carrying the outer roll of the pair, the swinging arms carrying the inner roll of the pair, and means consisting of levers mounted on a cam-shaft, said cam-shaft, and hand-lever thereon, for operating said swinging arms to carry said inner roll into grinding relation with said outer roll or to part it therefrom, substantially as shown and specified.

5. The combination, in a roller-mill, of the roll-carrying swinging arms D, mounted on pivots *d*, and provided with adjusting-screws *d′*, the tempering-rods F, and the levers G, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 6th day of February, A. D. 1884.

JESSE WARRINGTON. [L. S.]

In presence of—
E. W. BRADFORD,
CHAS. L. THURBER.