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A. MOORE.

ROLLER MILL.

No. 466,251. Patented Dec. 29, 1891.

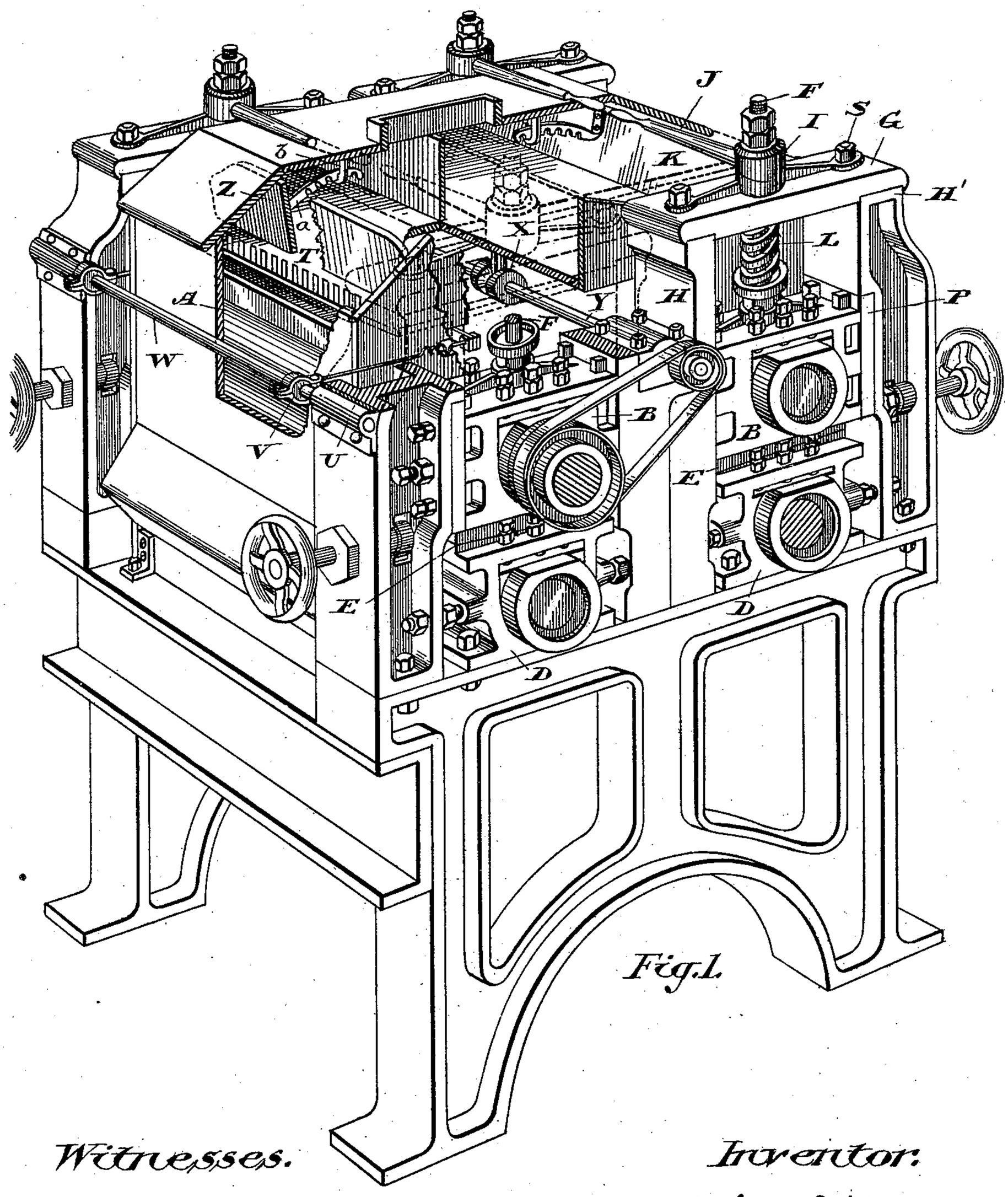

Fig. 1.

Witnesses.

J. Edw. Maybee

H. G. McMillan

Inventor:

Arthur Moore

by Donald C. Ridout & Co

Atty

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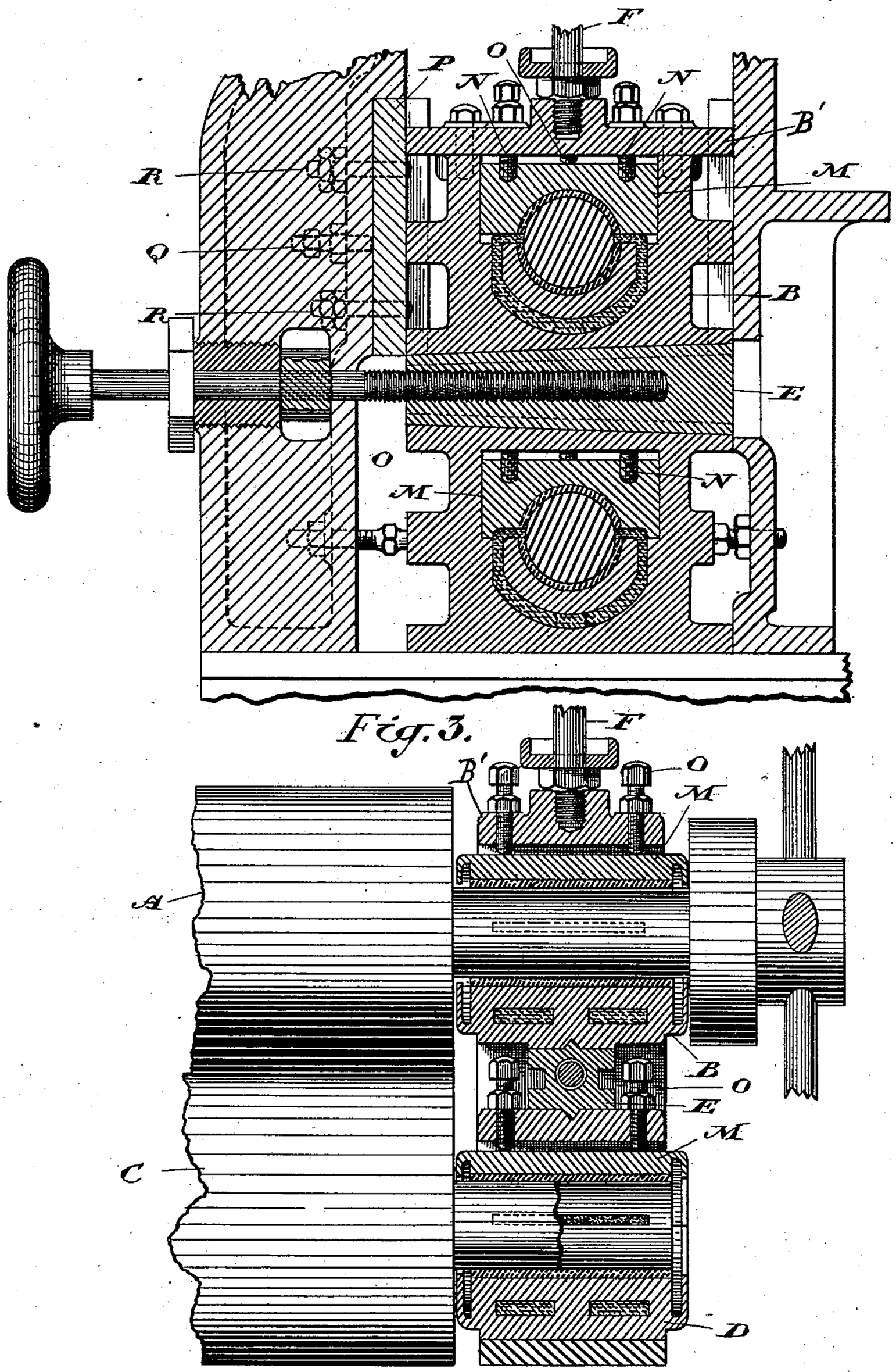

Fig. 3.

Fig. 2.

Witnesses.

J. Edw. Maybee

W. G. McMillan

Inventor:

Arthur Moore

by Donald C. Ridout & Co.

Attys.

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A. MOORE.

ROLLER MILL.

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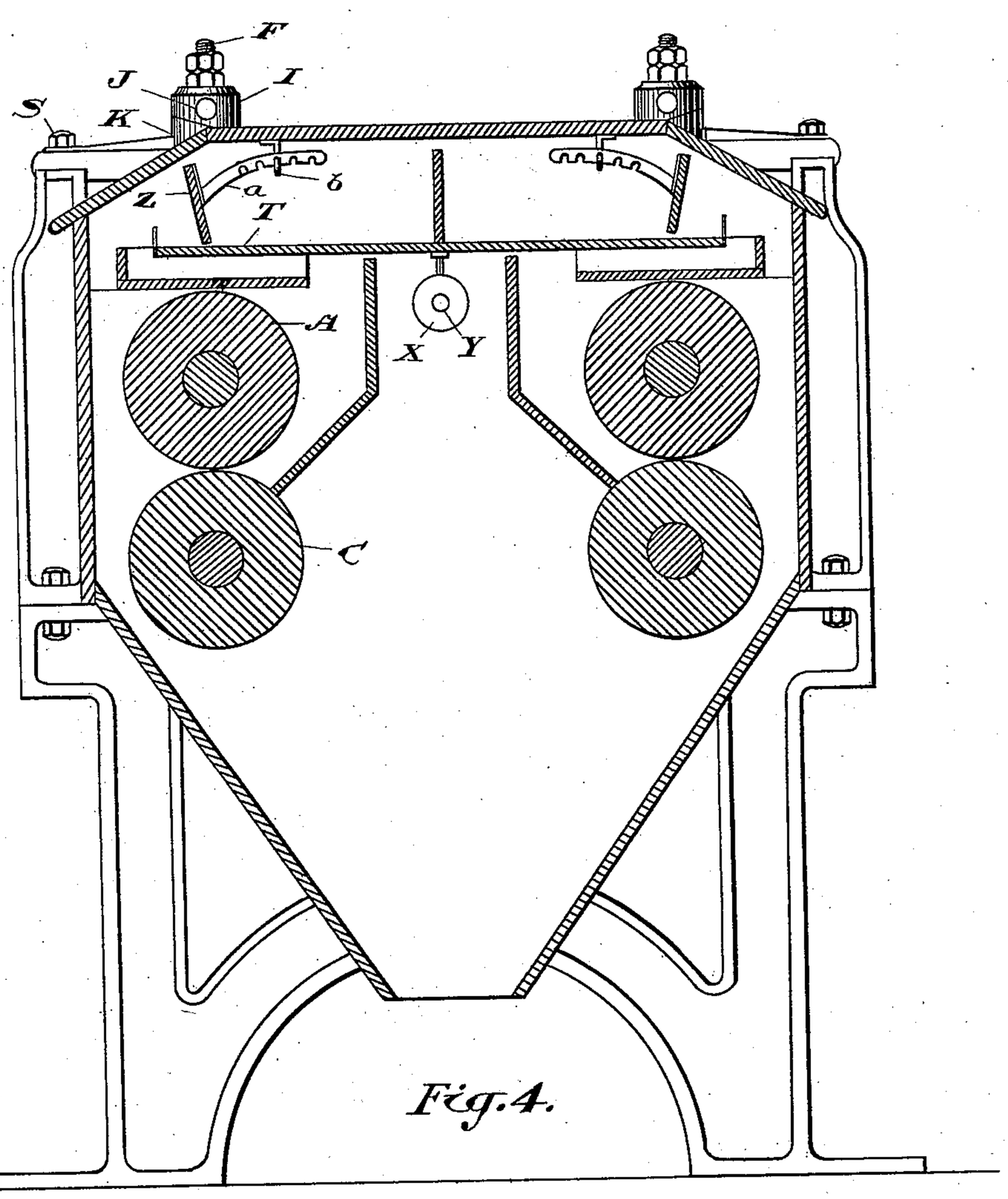

Fig. 4.

Witnesses.

J. Edw. Maybee

H. G. McMillan

Inventor.

Arthur Moore

by Donald C. Ridout & Co.

attys.

(No Model.) 4 Sheets—Sheet 4.

A. MOORE.

ROLLER MILL.

No. 466,251. Patented Dec. 29, 1891.

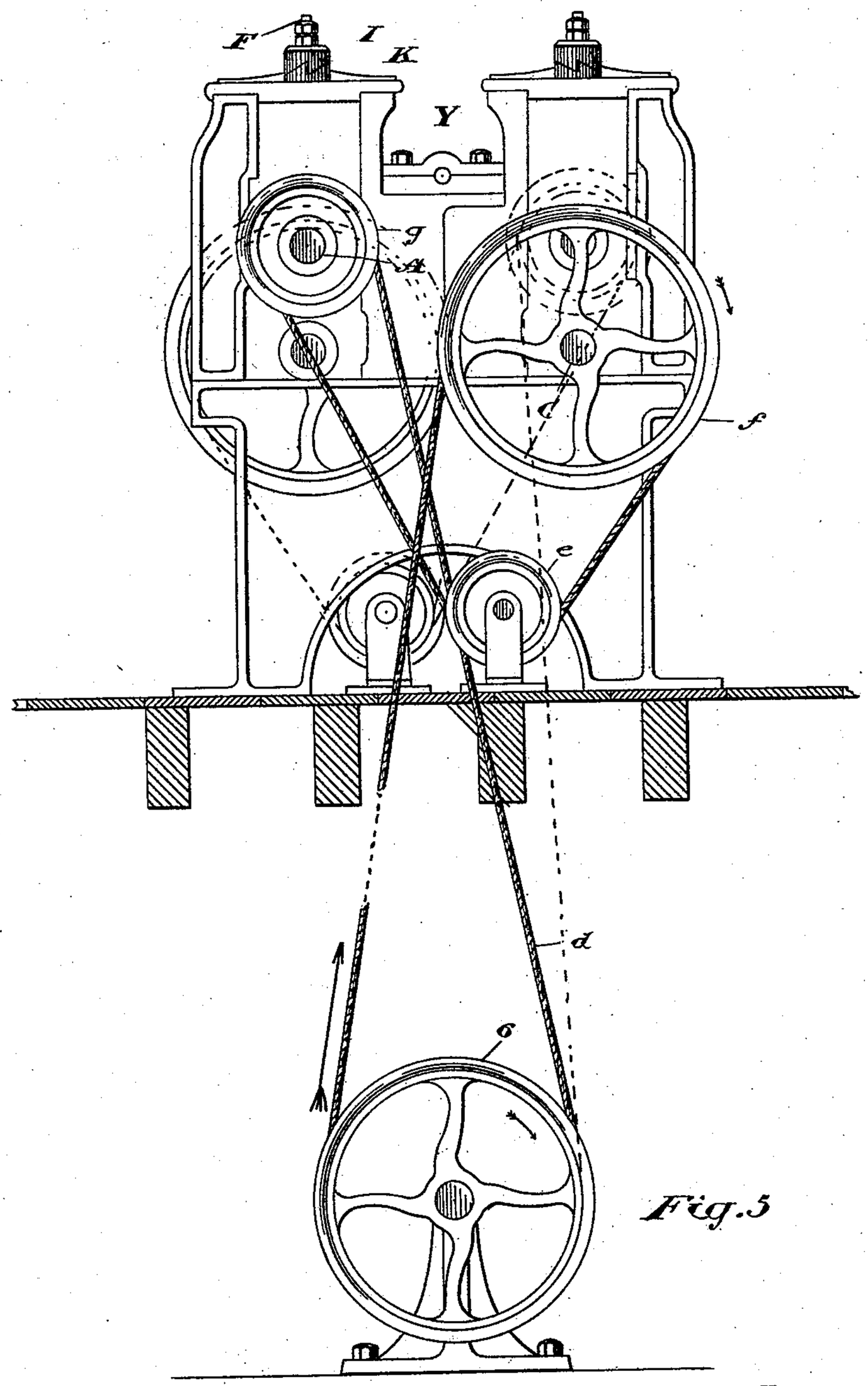

Fig. 5

Witnesses

J. Edw. Maybee

W. G. McMillan

Inventor

Arthur Moore

by Donald C. Ridout & Co.

attys.

UNITED STATES PATENT OFFICE.

ARTHUR MOORE, OF TORONTO, CANADA.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 466,251, dated December 29, 1891.

Application filed April 24, 1890. Serial No. 349,367. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR MOORE, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented a certain new and useful Improvement in Roller-Mills, of which the following is a specification.

The object of the invention is, first, to arrange the rolls so that they shall operate in conjunction with each other with a steady motion, the distance between the rolls being readily adjusted to the finest nicety; secondly, to arrange the feed so that the wheat shall be evenly distributed over the full length of the roll, and, thirdly to arrange a rope-drive so as to operate satisfactorily to drive the fast roll and to brake the slow roll with the least possible tension on the rope; and it consists in the peculiar construction, arrangement, and combinations of parts hereinafter more particularly described, and then definitely pointed out in the claims.

Figure 1 is a perspective view of my improved roller-mill broken away in parts to expose its interior construction and omitting the driving rope and pulleys. Figs. 2 and 3 are enlarged sectional details showing my improved means for adjusting and holding the bearing-boxes of the roll. Fig. 4 is a cross-section showing the parts of the feed in which my improvements are involved. Fig. 5 is a side view showing my improved rope-drive.

As both pairs of rolls are arranged in the same way, it will be sufficient for the purpose of the first portion of this specification to describe the mechanical parts connected with one pair of rolls, which, it will be seen, are so arranged that the members of each pair are set one above the other.

A is the upper or fast roll, suitably journaled in a bearing-box B, having a cap B′.

C is the lower or slow roll, suitably journaled in bearing-box D.

E is a wedge-shaped block placed between the bearing-boxes B and D, the bottom of the bearing-box B being beveled to correspond and rest against the taper of the block E.

F is a spindle connected with the top of the box B and extending through the cap G, which is bolted to the top of the housing H. A collar I is loosely fitted onto the spindle F and is provided with a handle J. The bottom surface of the collar I is inclined or cam-shaped and corresponds inversely in shape with the stationary hub K, cast upon or fixed to the cap G.

L is a powerful spring placed on the spindle F between the bearing-box B and the cap G, the said spring being designed to give the necessary elastic pressure against the top roll A.

A corresponding spindle and the parts described are provided for each end of each top roll. When it is necessary to raise the top roll clear of its mate, the handle J is moved so as to force the collar I up to the inclined surface formed on the hub K.

By placing the wedge-shaped block E between the bearings of the upper and lower rolls the pressure directed onto the top of the upper roll is conveyed with equal force onto the bearings of the lower roll, both rolls being thus held with absolute rigidity, which effectually prevents the vibratory or chattering motion of either of the rolls, thus insuring an even and regular grind.

Owing to the wedge-shaped block E and the means provided for adjusting it, it will be seen that the distance between the rolls may be instantly adjusted to the greatest nicety.

On reference to Figs. 2 and 3 it will be observed that each bearing-box is provided with a cap or block M, fitted onto the spindle of the roll and made so that its bottom will not come in contact with the top of its bearing-box. This cap or block is supported by screw-bolts N, which are adjusted so as to allow the said cap or block to be held against the spindle of the roll by the pressure directed by the pinch-screws O. This arrangement provides easy means for adjusting the cap or block to give the necessary pressure against the bearings. In order to prevent any lateral movement of the bearing-box B, which must be capable of moving vertically while the machine is in operation, I provide a check-block P, which is adjusted against the side of the box B by means of the pinch-bolts Q and screw-bolts R.

With a view of providing easy means for

the removal of the rolls I bolt the outside housing II′ to the frame of the machine. It is therefore merely necessary to remove the bolts S, raise the cap G, and remove the spindle F, when the said housing may be removed.

On reference to Figs. 1 and 4 my improvement in the feed will be seen. The feed-board T is supported in such a way that it may be moved horizontally. Sometimes it is necessary to impart a vibratory side movement to this feed-board and sometimes a vibratory end motion must be given to it. In the drawings I show mechanism for imparting both of these movements; but it will of course be understood that only one movement at a time will be used. In order to give the end vibratory movement, I connect the feed-board T by spring-rods U to eccentrics V, fixed to the shaft W, which derives a rotary motion from some convenient moving part of the machine. In order to give the side vibratory motion to the feed-board T, I provide a pin on the bottom of the said feed-board T, which fits between two cam-shaped blocks X, fixed to the shaft Y, which derives a revolving motion from one of the rolls A, as indicated in Fig. 1. Z is a board provided with arms *a*, having a series of notches made on their bottom edges, the said notches being designed to fit over the catches *b*, which are fixed to a stationary part of the machine. By means of these notches the board Z may be moved nearer to or farther from the edge of the feed-board T. The farther the board Z is moved from the edge of the feed-board T the lighter will the said board Z rest upon the feed-board T, and the nearer the stop-board Z is moved to the edge of the feed-board T the heavier will be the pressure of the said board Z on the said feed-board T. By thus adjusting the stop-board Z the resistance which it will offer to the stream of grain may be increased or decreased, as desired, to spread the grain in accordance with the judgment of the miller.

On reference to Fig. 5 my improved system of rope-drive will be seen. In this figure I show the rope-drive on one side of the machine, the duplicate pair of rolls being similarly driven on the opposite side, the rope on that side being shown in dotted lines to prevent confusing it with the rope on the near side. In this figure I show the main driving-wheel 6, which is not shown in the other figures of the drawings, as it is usually placed below the floor on which the machine stands. We will assume that this pulley is revolving in the direction indicated by arrow, in which case the rope *d* will travel in the direction indicated by arrow, which directs it to a pulley *f*, fixed to the axle of the lower slow-roll C. After passing around this pulley, which revolves as indicated by arrow, the rope *d* passes down around the idler or guiding-pulley *e*, thence up and around a small pulley *g*, fixed to the shaft of the fast roll A, and thence back to the main driving-pulley 6. It will be observed that this single rope drives the slow roll C on one pair and the fast roll A on the other pair of rolls, and the corresponding rope on the other side drives the other or duplicate pair of rolls not driven from the side shown in the drawings, so that both top rolls A revolve fast, while the bottom rolls C revolve slowly. It is of course understood by all millers that the friction of the stock passing between the rolls has a tendency to cause the slowly-revolving roll C to revolve as quickly as its fast-revolving mate. This tendency is checked by the arrangement described of my rope-drive in the following way: As before stated, the rope *d*, when it leaves the pulley 6, passes around the pulley connected to the slow roll C. Consequently the portion of the rope extending between the pulley 6 and the pulley on the roll C should be the loose side of the rope-drive; but as the fast roll A, running in connection with the roll C, now referred to, forces the roll C beyond its proper speed, the portion of the rope extending between the pulley 6 and the pulley on the roll C is tightened and acts as a brake to hold back the speed of the roll C, which is thus kept at its regular speed called for by the size of the pulley.

A result of my system of drive is an absence of friction on the guide or tightening pulley and a consequent or corresponding saving of power, as the rope both going from and returning to the driving-pulley is tight—*i. e.*, working—or both sides are working sides. The rope is slack both going onto and coming off the guide-pulley.

What I claim as my invention is—

1. In a roller-mill, and in combination with the housings thereof, the bearing-box B, fitted between the housings, a check-block P, grooved on one side and embracing one side of the box and adjustably secured in place by the pinch-bolt Q, pressing against the back of the check-block, and screw-bolts R, passing through both check-block and housing, substantially as described and shown.

2. In a roller-mill, the combination of the box B, a cap B′, bolted thereto, the block M, set in the box, the bolts N, set into said block M, and the pinch-screws O, passing through the cap B′ and bearing against the block M, substantially as shown and described.

3. In a roller-mill, the combination, with the two pairs of rolls, the members of each pair being arranged one above the other, of two sets of drivers, as the rope *d*, each passing from the drive-wheel 6 up between two pulleys of different sizes, around the larger one and down to an idler or guide, thence up to and around the small pulley, and down again between the large and small pulleys to the driving-wheel, substantially as described.

Toronto, March 24, 1890.

ARTHUR MOORE.

In presence of—
CHARLES C. BALDWIN,
J. E. CAMERON.