(No Model.)

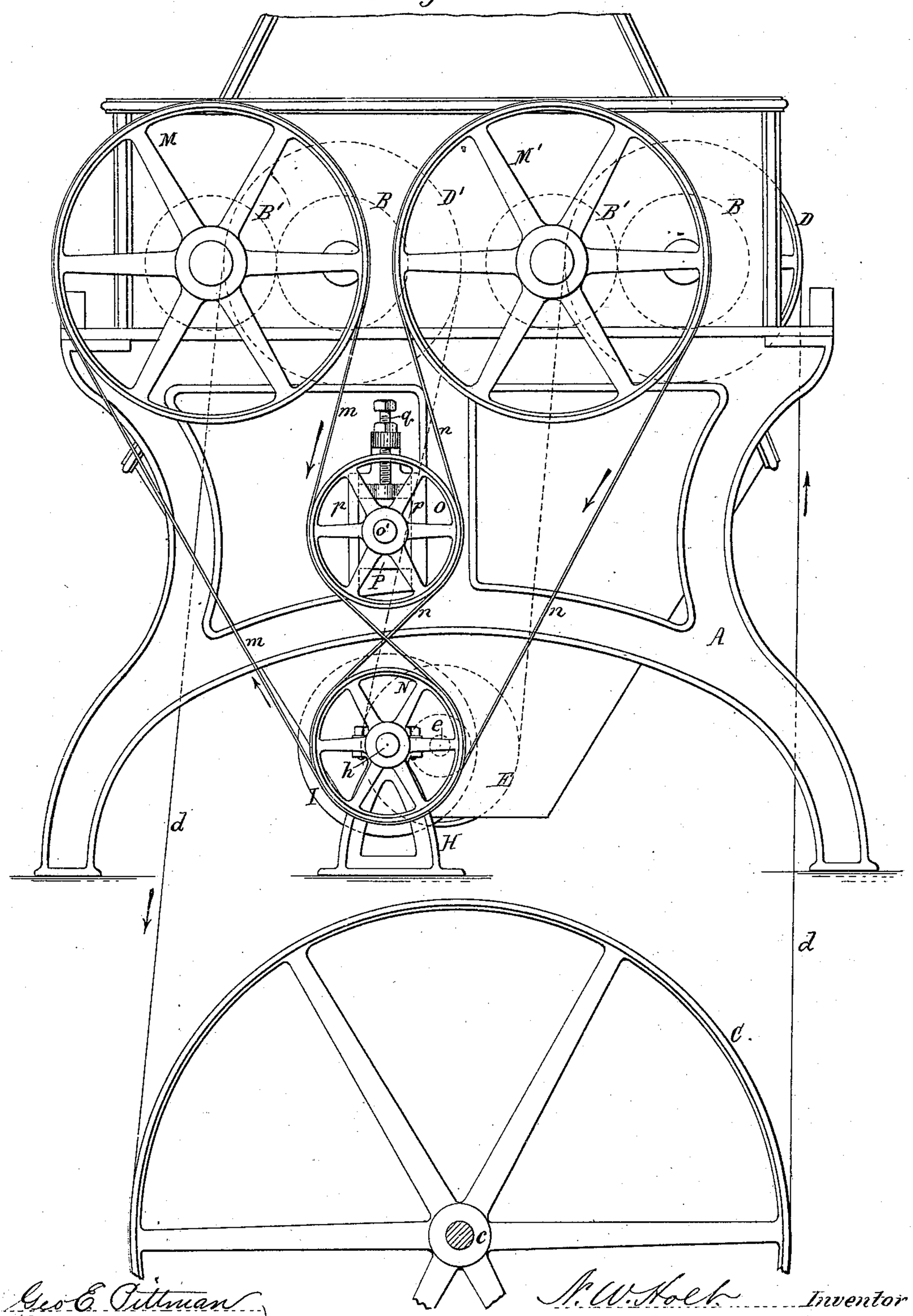
2 Sheets—Sheet 1.

N. W. HOLT.

ROLLER MILL.

No. 298,206. Patented May 6, 1884.

Fig. 1.



Witnesses.
Geo. E. Pittman
Theo. L. Popp.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

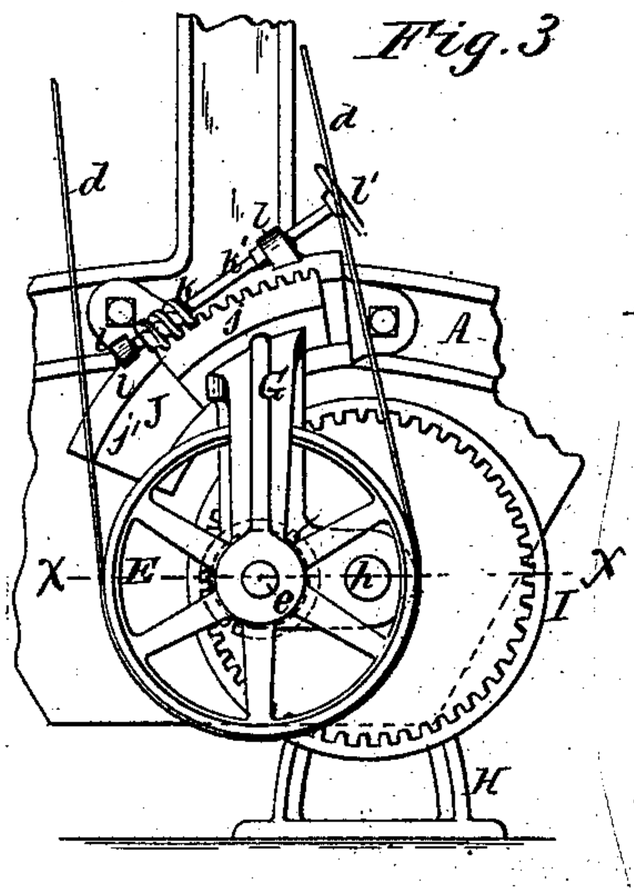


Fig. 4.

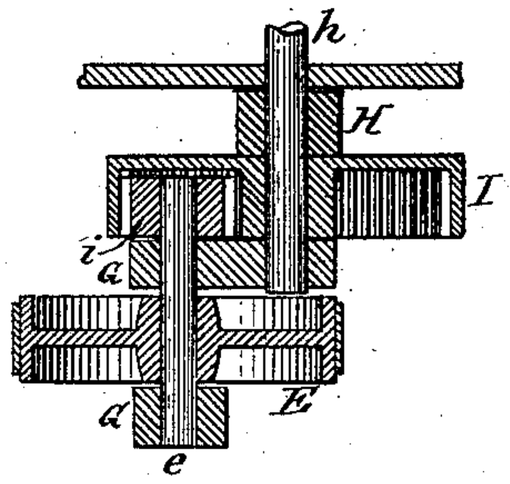


Fig. 2.

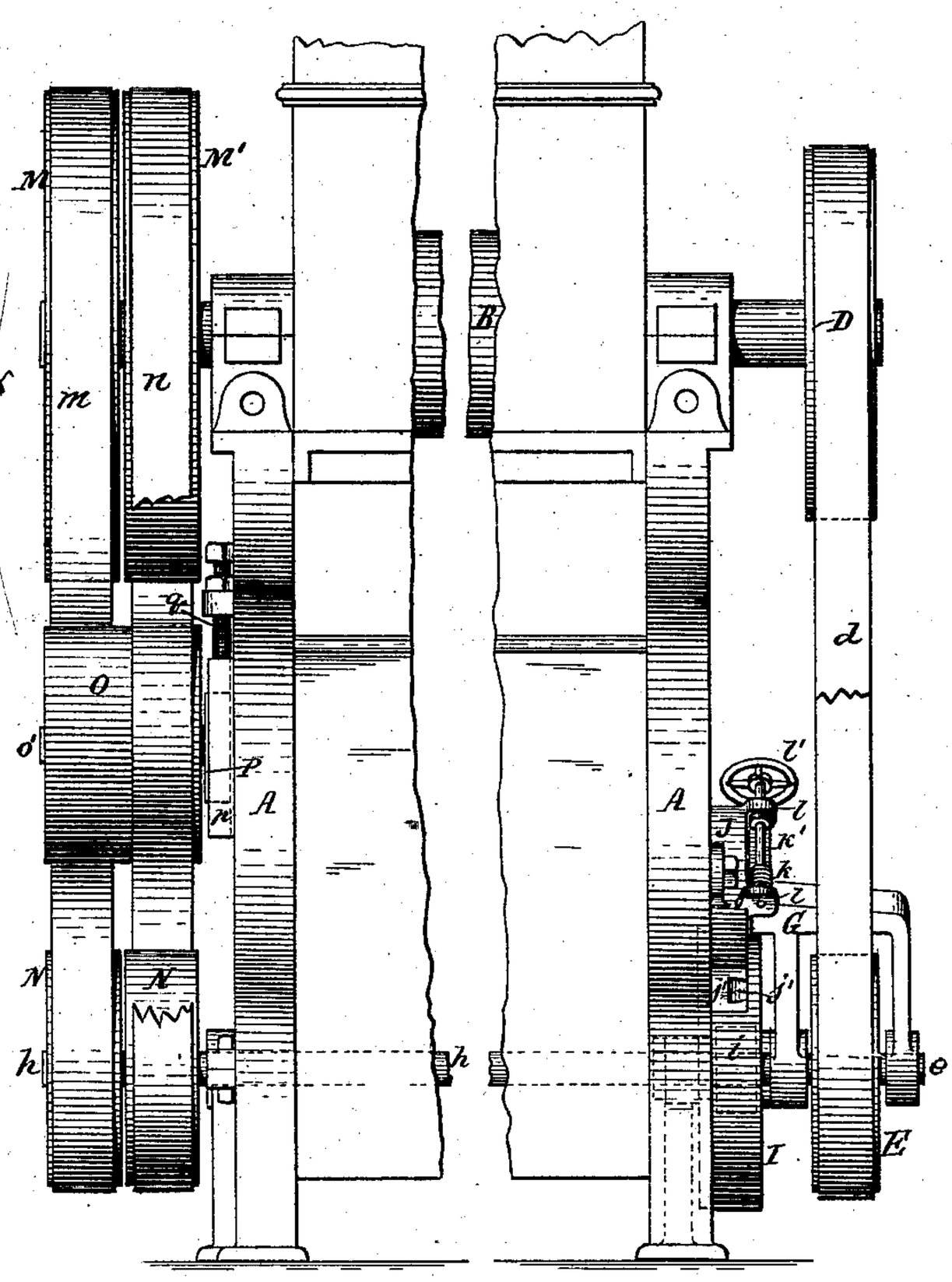
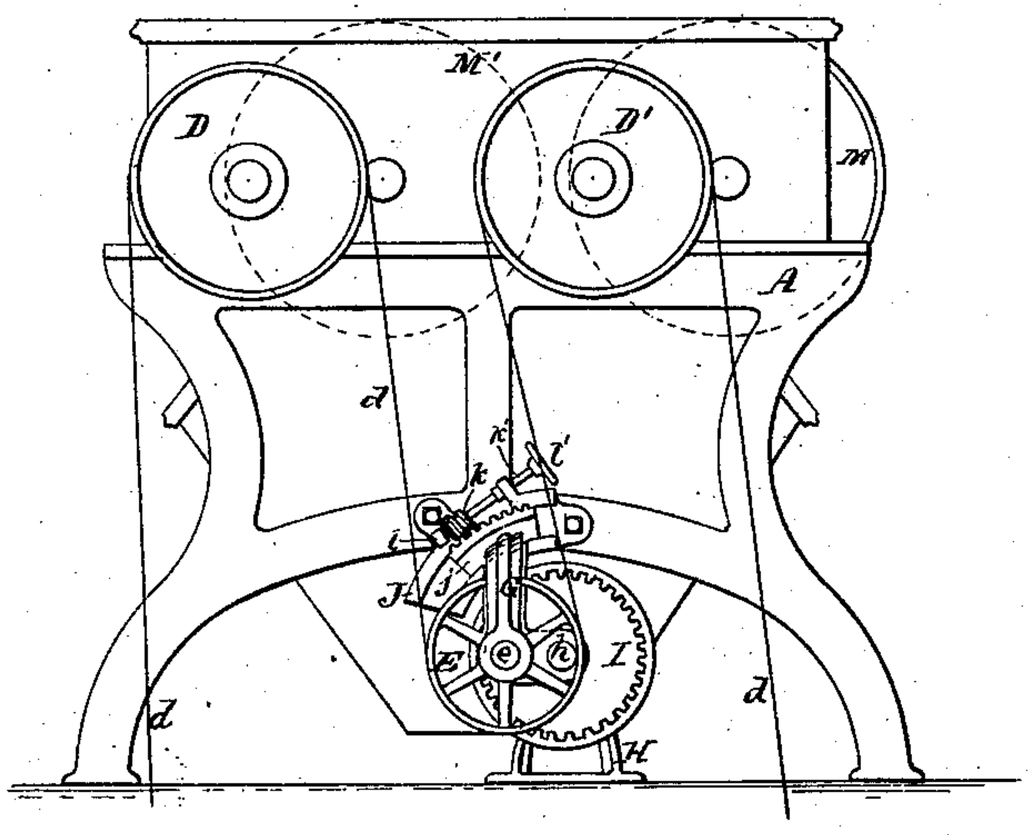


Fig. 5.



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Geo. E. Pittman
Witnesses: Theo. L. Popp.

UNITED STATES PATENT OFFICE.

NOAH W. HOLT, OF BUFFALO, NEW YORK.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 298,206, dated May 6, 1884.

Application filed January 21, 1884. (No model.)

To all whom it may concern:

Be it known that I, NOAH W. HOLT, of the city of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Roller-Mills, of which the following is a specification.

This invention relates to an improvement in that class of roller-mills in which two pairs of rollers are employed; and it has for its object to provide a belt driving mechanism which can be tightened when required, and in which a counter-shaft is employed which is supported in fixed bearings.

My invention consists of the improvement in the construction of the driving mechanism which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 represents an elevation of the driven side of a roller-mill provided with my improvement. Fig. 2 is an end elevation of the roller-mill. Fig. 3 is a side elevation of the tightening device on the driving side of the roller-mill. Fig. 4 is a horizontal section in line *x x*, Fig. 3. Fig. 5 is an elevation of the driving side on a reduced scale.

Like letters of reference refer to like parts in the several figures.

A represents the side frames of the roller-mill.

B B represent the fast rollers, and B′ B′ the slow rollers. (Indicated by broken lines in Fig. 1.)

c represents the horizontal driving-shaft arranged below the roller-mill, and C a belt-pulley secured to the same.

D D′ are belt-pulleys secured to the shafts of the fast rollers B B above the driving-pulley C.

d is an endless driving-belt running around the pulleys C and D D′, and communicating motion to the latter.

E represents an adjustable tightener-pulley arranged on one side of the roller-mill below the pulleys D D′. This pulley is mounted on a shaft, *e*, which is journaled in an adjustable bifurcated frame, G.

h represents the transverse counter-shaft, whereby motion is transmitted from the driving side to the driven side of the roller-mill. The shaft *h* is supported in fixed bearings H, secured to the floor or to the side frames, A, or to some other stationary part.

I represents an internally-toothed gear-wheel, secured to the shaft *h* on the driving side of the machine, and *i* is a pinion meshing with the wheel I and secured to the inner end of the shaft *e*. The frame G, in which the shaft *e* is journaled, is pivoted on the end of the shaft *h*, so that in adjusting the frame G it swings on the shaft *h* as an axis, thereby causing the pinion *i* to remain in engagement with the wheel I in all positions of the frame G. The latter is provided at its upper end with a gear-segment, *j*, arranged concentrically with the shaft *h*. The gear-segment *j* is made in the form of a dovetail, and moves in a bearing-piece, J, having a curved dovetail groove, *j′*, whereby the upper end of the frame G is held against lateral movement, while capable of being adjusted in the arc of a circle.

k represents a worm-wheel engaging with the segment *j*, and mounted on a shaft, *k′*, which is journaled in bearings *l*, secured to the bearing-piece J. The end of the shaft *k′* is provided with a hand-wheel, *l′*, whereby it can be turned for adjusting the position of the frame G and for raising and lowering the pulley E. The driving-belt *d* runs around the lower side of the pulley C, thence upwardly and around the upper side of the pulley D, thence downwardly and around the lower side of the pulley E, thence upwardly and around the upper side of the pulley D′, and thence downwardly to the pulley C. The belt *d* is tightened by lowering the pulley E.

M M′ represent the belt-pulleys secured to the shafts of the slow rollers B′ B′ on the driven side of the machine. N N are pulleys secured to the end of the counter-shaft *h* below the pulleys M M′, and *m* and *n* are endless belts running around the pulleys N N and the pulleys M M′.

O represents an adjustable tightener-pulley arranged between the belts *m* and *n*, so as to operate against both belts simultaneously. The tightener-pulley O is mounted on a stud or arbor, *o′*, which is attached to a sliding piece, P, fitted between vertical guides or ways *p p*. The latter are attached to the side frame, A, and the piece P is made adjustable by a set-screw, *q*. The power is transmitted from the pulley C to the pulleys D D′ and to the coun-

ter-shaft *h* by the belt *d*. From the counter-shaft the motion is transmitted to the pulleys M M′, so as to retard the slow rollers B′ B′, as desired. The belt *d* is tightened by adjusting the pulley E, and the belts *m* and *n* are both tightened simultaneously by adjusting the pulley O.

A friction-gear may be employed instead of the cog-wheels I *i*, if desired.

I claim as my invention—

1. The combination, with two pairs of rollers, B B and B′ B′, of pulleys D D′ and M M′, secured to the roller-shafts on opposite sides of the machine, a counter-shaft, *h*, carrying a wheel, I, and pulleys N N, an adjustable pulley, E, mechanism whereby motion is transmitted from the pulley E to the wheel I, and endless driving-belts *d*, *m*, and *n*, substantially as set forth.

2. The combination, with the fast rollers B B and the slow rollers B′ B′, of the counter-shaft *h*, supported in fixed bearings, a tightener-pulley, E, a belt, *d*, driving said tightener-pulley and the fast rollers, mechanism whereby power is transmitted from said tightener-pulley to said counter-shaft, and a belt driving mechanism provided with a tightening device, and connecting the counter-shaft with the slow rollers, substantially as set forth.

3. The combination, with the rollers B B and B′ B′, of the pulleys D D′ and M M′, counter-shaft *h*, tightener-pulley E, made adjustable concentric with said counter-shaft, mechanism whereby motion is transmitted from the tightener-pulley E to said counter-shaft, and mechanism whereby the counter-shaft is connected with the pulleys M M′, substantially as set forth.

4. In a roller-mill, the combination, with the counter-shaft *h*, provided with a wheel, I, of the pulley E, shaft *c*, and pinion *i*, a frame, G, pivoted concentric with the shaft *h*, and means whereby the frame G can be secured in position, substantially as set forth.

5. In a roller-mill, the combination, with the pulleys M M′, shaft *h*, pulleys N N, and belts *m n*, of a tightener-pulley, O, operating against both belts, substantially as set forth.

6. In a roller-mill, the combination, with the counter-shaft *h*, provided with a wheel, E, of a frame, G, pivoted concentric with said shaft, and provided with a shaft, *c*, and pinion *i*, a gear-segment, *j*, formed on said said frame, and a worm-wheel, *k*, substantially as set forth.

7. In a roller-mill, the combination, with the frame A and counter-shaft *h*, of a frame, G, pivoted concentric with the counter-shaft, and provided with a dovetail segment, *j*, a bearing-piece, J, secured to the frame A, and having a curved dovetail groove, *j′*, a shaft, *c*, supported in the frame G, and means whereby the frame G is adjusted and secured in position, substantially as set forth.

Witness my hand this 12th day of January, 1884.

NOAH W. HOLT.

Witnesses:

EDWARD WILHELM,

C. F. GEYER.