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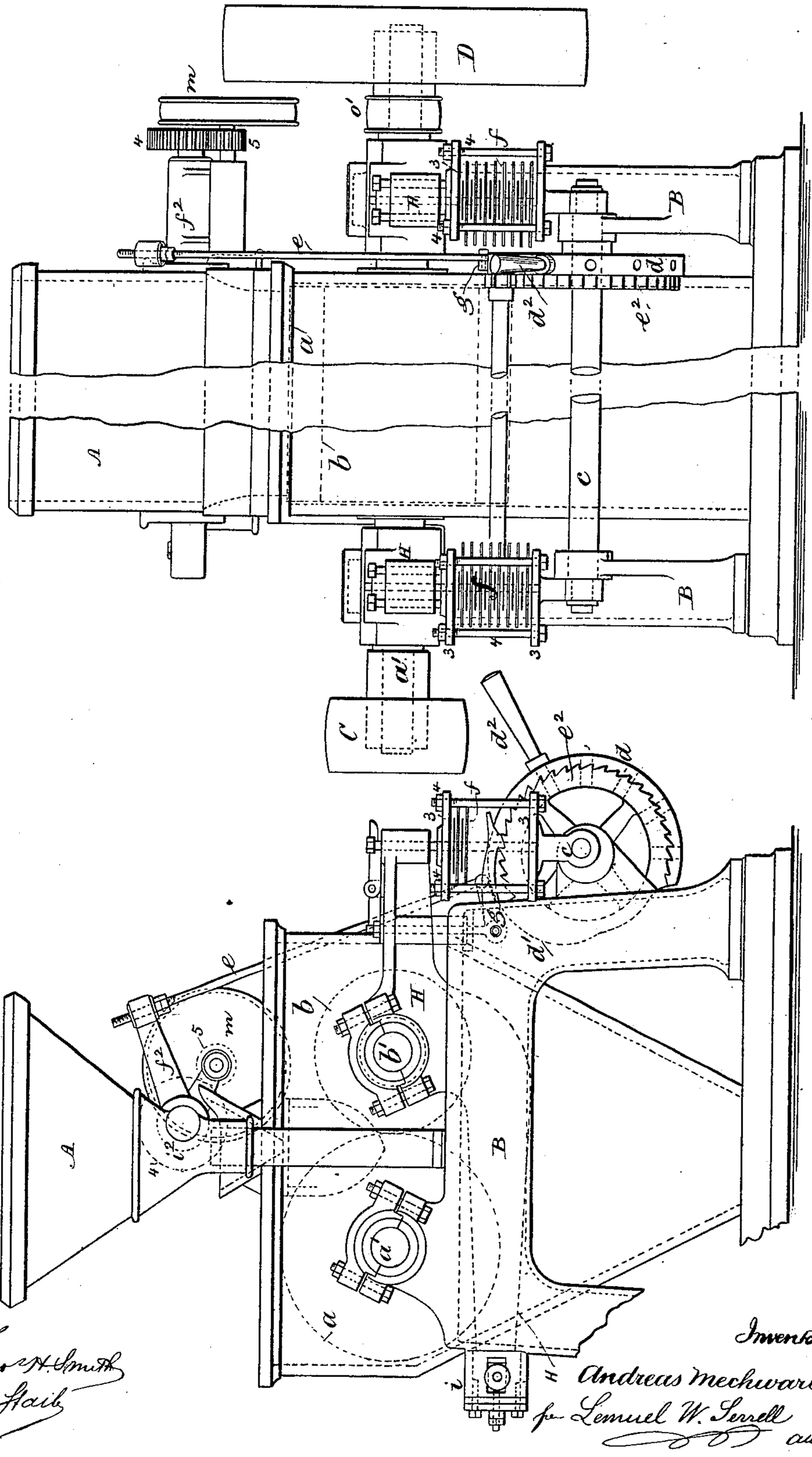
A. MECHWART.

ROLLER MILL.

No. 267,556. Patented Nov. 14, 1882.

Fig. 2.



Witnesses

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(No Model.) 3 Sheets—Sheet 2.

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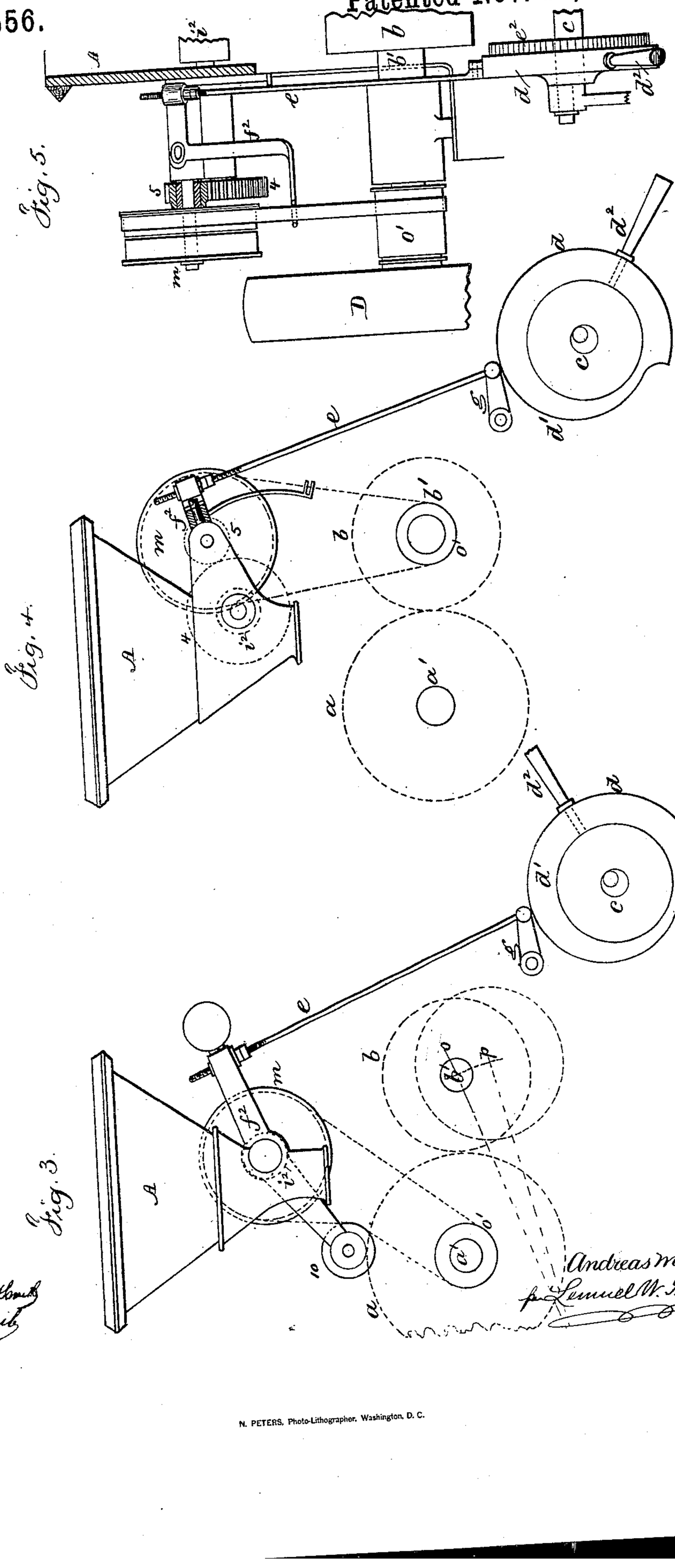

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(No Model.) 3 Sheets—Sheet 3.

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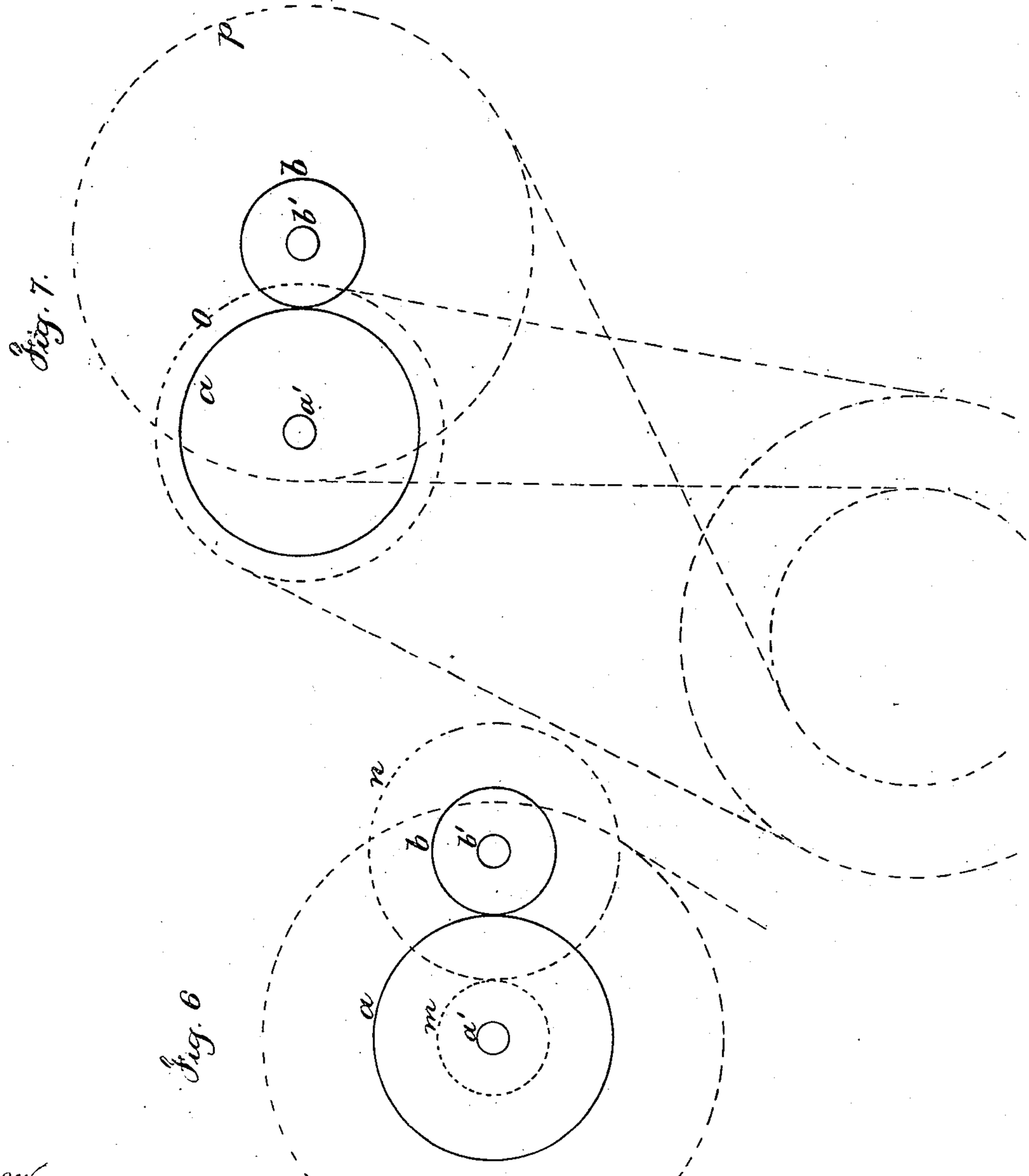

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UNITED STATES PATENT OFFICE.

ANDREAS MECHWART, OF BUDA-PESTH, AUSTRIA-HUNGARY.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 267,556, dated November 14, 1882.

Application filed March 27, 1882. (No model.) Patented in Austria July 5, 1881, No. 24,544; in Hungary July 5, 1881, No. 23,866, and in Denmark January 24, 1882, No. 2,476.

To all whom it may concern:

Be it known that I, ANDREAS MECHWART, of Buda-Pesth, Austria-Hungary, have invented an Improvement in Roller-Mills, of which the following is a specification.

Letters Patent of the following countries have been granted to me for this invention: Austria, July 5, 1881, No. 24,544; Hungary, July 5, 1881, No. 23,866; Denmark, January 24, 1882, No. 2,476.

My present invention relates to roller-mills in which one roller is in stationary bearings or boxes, and the other is upon movable levers, to adjust the proximity of such rollers and the fineness of the ground or crushed product.

In the drawings, Figure 1 is an elevation endwise of the rollers. Fig. 2 is an elevation sidewise with the central portion of the mill removed. Fig. 3 is a diagram illustrating the means for operating the belt-tightener, and Figs. 4 and 5 are similar views of the same mechanism with a belt-shifter in place of a belt-tightener. Figs. 6 and 7 are diagrams illustrating means for driving the rollers.

A represents the hopper; B B, the frames of the machine; *a* and *b*, the crushing or grinding rollers, and *a' b'* the respective shafts and journals of the rollers. C is the driving-pulley for the roller *a*, and D the pulley for the roller *b*. These rollers *a* and *b* are preferably of different sizes. The diagrams Figs. 6 and 7 illustrate the sizes of roller wheels and pulleys that may be employed.

It is very important that the roller that moves with the greatest speed of surface be of a larger diameter than the roller that moves at a slower speed, because the wear is the greatest upon the roller that moves the fastest, and by having a larger roller it wears longer, and is less liable to become heated by friction. To obtain the proper gearing to drive these rollers has been very difficult, because, if the roller that is largest is made to travel with a slower surface speed than the smaller roller, the speed of the small roller must be augmented by the use of a small pulley or pinion, and hence the belt on this small pulley is liable to slip or be broken or the teeth of the pinion to be injured. Such an arrangement is shown in Figs. 6 and 7. The large roller *a* is located in fixed bearings, the small roller in the movable ones. The first turns quickly, the latter slowly, and this either by means of gear-wheels *m n*, as shown in Fig. 6, or through driving-pulleys *o p*, as shown in Fig. 7, which gives motion to belts and pulleys which have the same relative proportion. In both Figs. 6 and 7 the rollers have a relative speed of about one to four and one half. In Fig. 7 the driving-pulleys have a proportion of three to five. The pulleys of the gearing have the same proportion. From this and from the proportion of the size of the rollers there results a difference of circumferential speed of one to five and five-ninths. The journals of the roller *b* are supported in boxes or bearings in the levers H. These levers are nearly horizontal, and are pivoted at the ends to the frame by the adjustable fulcrums *i*. Upon reference to Fig. 3 it will be seen that the arc *o p*, described by the axis *b'* of the roller *b*, is much longer than the distance that the roller *b* is from the roller *a* when the axis of *b* has been moved to *p*. Hence the adjustment of the rollers can be made with great accuracy. This arc *o p* is nearly parallel to the surface of the roller *a*, where the grinding takes place. Hence the roller *b* is moved in the same arc, and the delicate adjustment required can be obtained with comparatively short levers.

The cross-shaft *c* is in bearings upon the frame B, and it is provided with a wheel, *d*, and lever d^2, by which the wheel can be turned. There is also a ratchet-wheel, e^2, and pawl by which the parts are held in position. The ends of the shaft *c* are made as eccentrics or eccentric-pins, and the springs *f* intervene between the ends of the levers H and the eccentrics on *c*. These springs are of any suitable character. I have represented heads 3 3, between which the rubber disks are laid, and there are set-screws at 4 4 to adjust the pressure. When the springs are raised by the eccentrics the roller *b* is pressed toward the roller *a*, and the reverse.

Upon the shaft *c* is a cam, *d'*. It is shown as part of the wheel *d*. It acts upon the rod *e* and gives to the same an end motion for the purpose of stopping and starting the roller-feed. The roller i^2 at the bottom of the hopper is similar to the roller-feed shown in my patent No. 251,124. In Fig. 1 this roller is repre-

sented as driven by gear-wheels 4 and 5, the latter being upon a stud on the lever f^2, and the belt-wheel m is connected with this gear 5, and there is a belt from m to the pulley o'. When the shaft c is turned so as to draw the roller b away from the roller a the cam d' allows the link g and rod e to descend, and thereby lower the belt-wheel m and stop the feed. The same effect is attained when the belt-wheel m is on the shaft of the roller i^2, as shown in Fig. 3, and the lever f^2 is provided with a tightener-roller, 10, that tightens the belt when the feed is to operate and loosens the belt when the roller b is separated from a.

In Figs. 4 and 5 the rod e, link g, and cam d' operate the angular lever f^2, that acts to shift the belt from a fast to a loose pulley on the shaft of i^2, or upon a stud, as shown, there being gearing between the belt-wheel and the feed-roller.

I claim as my invention—

1. In a roller-mill, the rollers a b, placed side by side, in combination with the levers H, passing nearly horizontally beneath the journals of the roller a, and pivoted at i, and having boxes for the journals of the roller b, and mechanism, substantially as set forth, for moving and holding the outer ends of said levers and adjusting the axis of the roller b in the arc of a circle that is nearly parallel to the surface of the roller a, where the grinding takes place, substantially as specified.

2. In a roller-mill, the combination, with the levers for moving one of the rollers, of an eccentric-shaft, a cam on the same, the rod e, feed-roller i^2, and mechanism between the feed-roller and the rod e, moved by said rod e, for stopping and starting the roller-feed, substantially as set forth.

Signed by me this 1st day of March, A. D. 1882.

ANDREAS MECHWART.

Witnesses:
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P. ZSIGMONDY.