

(No Model.)

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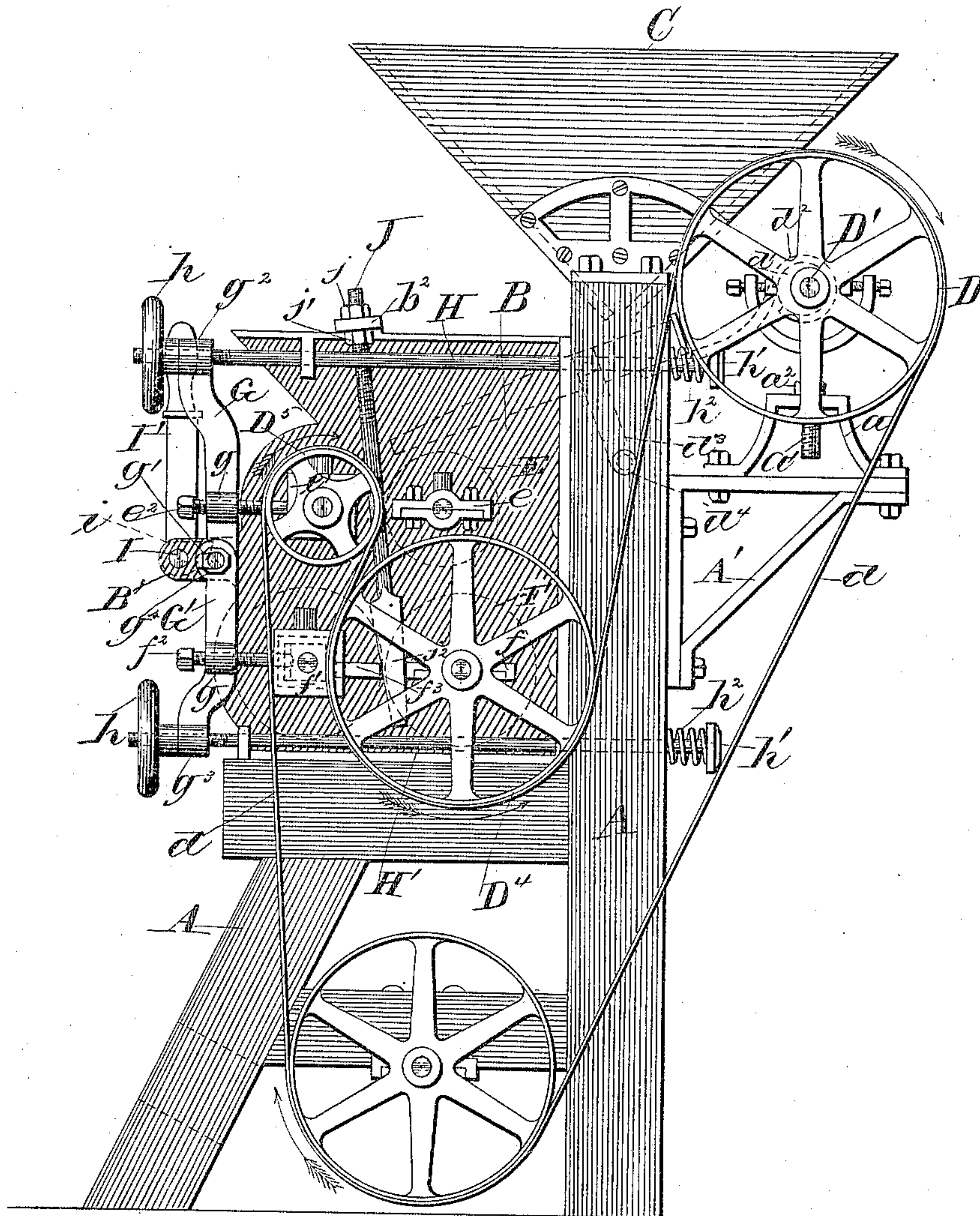
F. H. BOLTE & H. G. THEDE.

ROLLER MILL.

No. 330,288.

Patented Nov. 10, 1885.

Fig. 1.



Witnesses:

E. J. Jones

R. Platz

Inventors:

Frank H. Bolte

Herman G. Thede

By Stout & Hildeswood

Attorneys.

(No Model.)

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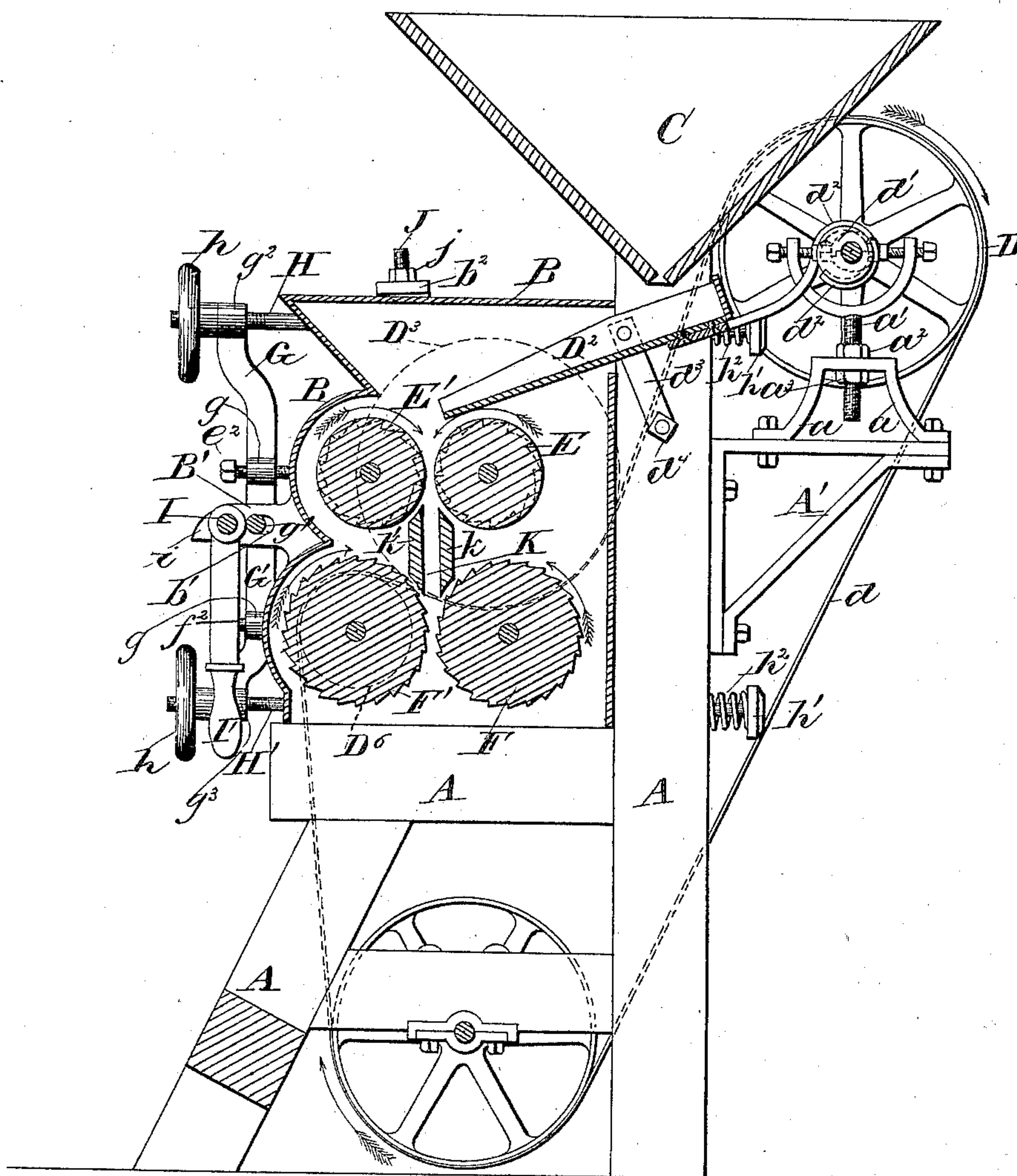
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Fig. 2.



Witnesses:

E. G. G. G. G.

R. Platz

Inventors:

*Frank H. Bolte
Herman G. Thede*

By J. H. J. H. J. H.

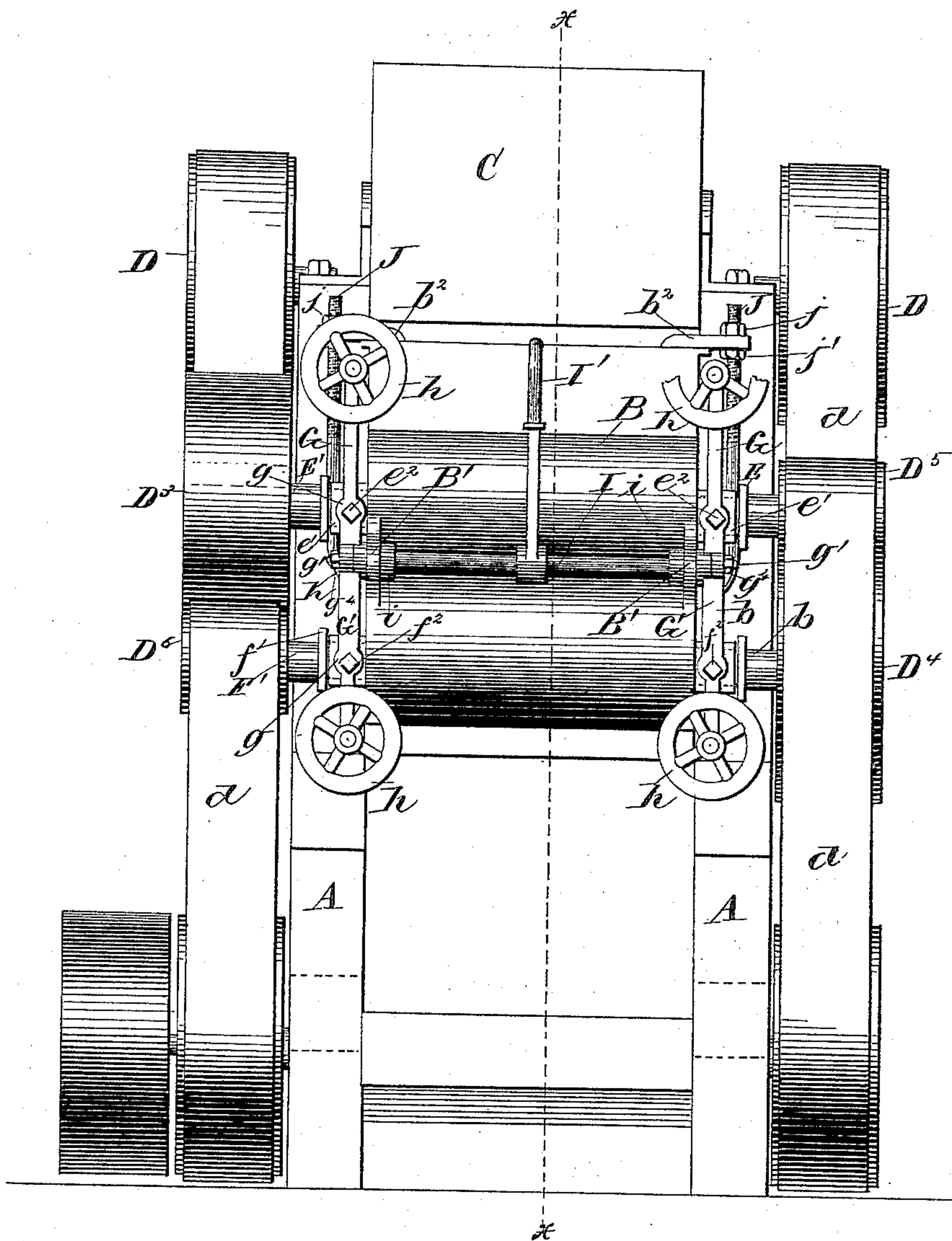
Attorneys.

4 Sheets—Sheet 3.

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Fig. 3.



Inventors:

Frank H. Bolte
Herman G. Thiede

By *Stout & Underwood*
Attorneys.

(No Model.)

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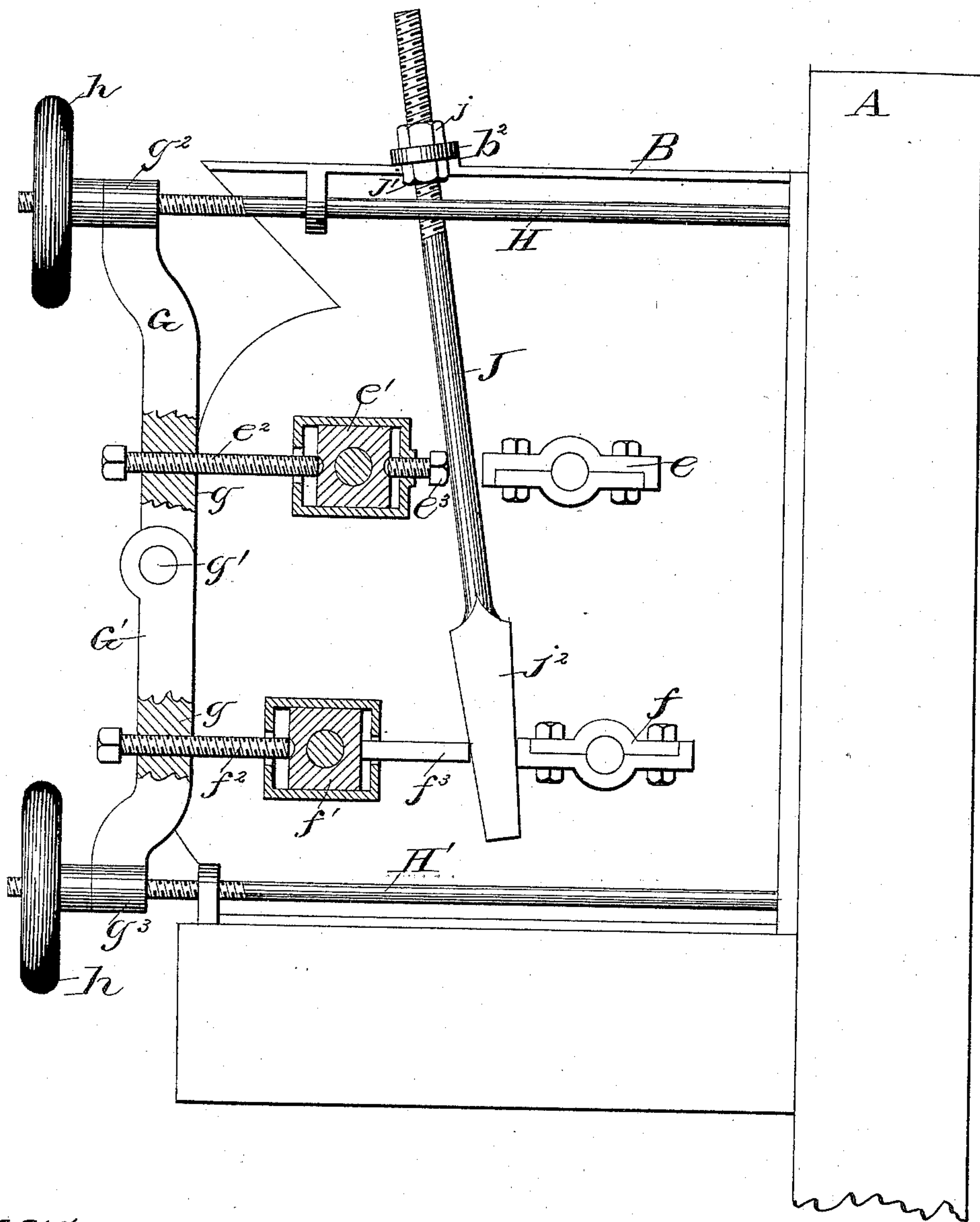
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Fig. 4.



Witnesses:

Ed. Jones

R. Platz.

Inventors:

F. H. Bolte

H. G. Theele

By Stout & Underwood,
Attorneys.

UNITED STATES PATENT OFFICE,

FRANK H. BOLTE AND HERMAN G. THEDE, OF MILWAUKEE, WISCONSIN,
ASSIGNORS OF ONE-THIRD TO JOHN W. THEDE, OF SAME PLACE.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 330,288, dated November 10, 1885.

Application filed May 31, 1884. Serial No. 133,272. (No model.)

To all whom it may concern:

Be it known that we, FRANK H. BOLTE and HERMAN G. THEDE, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Roller-Mills; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to roller-mills; and it consists in certain peculiarities of construction, as will be fully set forth hereinafter, and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of our improved roller-mill. Fig. 2 is a vertical section on the line xx of Fig. 3. Fig. 3 is a front elevation of our improved machine, and Fig. 4 is a detail drawn to an enlarged scale, and partly in section.

A A indicate the mill-frame, on the rear posts of which are firmly bolted the brackets A' A'. Each of these brackets has bolted on its upper face a saddle, a , through the perforated top of which is passed the threaded lower end of the bifurcated support a' , whereon is suitably mounted an idler, D, the support a' being held in place by means of the jam-nuts a^2 a^3 , working on its threaded end, and respectively against the upper and lower faces of the saddle-top. This arrangement makes of the supports and the pulleys thereon belt-tighteners, a few turns of the nuts a^2 a^3 being sufficient to give to the driving-belts d the degree of tension they require. An eccentric, d' , is formed close to one of the journaled ends of the idler-shaft D', and around this eccentric is fitted the stirrup d^2 , the inner end of which is connected to the grain-shaker D², suitably supported just below the opening of the hopper C, by means of the arms d^3 , pivoted on the bolts d^4 to the frame-posts. The inner end of the grain-shaker D² hangs in an inclined position inside the casing B, toward the front of the mill, and opposite the inner edge of the fixed cracking-roller E, which latter is journaled in stationary bearing-boxes e in the sides of the casing B, and is driven by the large pulley D³. The other cracking-roller, E', is journaled in horizontally-sliding boxes e' , suitably mounted in the outer face of the casing, and is driven by the smaller pulley D⁵. These rollers may have

ridges or corrugations formed around their peripheries, as shown in dotted lines, and may be made of any suitable material. The grinding-roller F is mounted in fixed bearing-boxes f in the sides of the casing, at a suitable distance below the cracking-roller E, and is driven by the large pulley D⁴. The other grinding-roller, F', is journaled in the horizontally-sliding boxes f' , and is driven by the smaller pulley D⁶. These rollers are driven in opposite directions, as usual, and at different rates of speed. The sliding motion of the adjustable rollers E' and F' in a forward direction is practically limited by the adjusting-screws e^2 f^2 , the respective inner ends of which simply bear against the socketed front edges of the sliding boxes e' f' , without being connected thereto, the threaded bodies of said screws e^2 f^2 working in threaded perforations made for them in the swelled portions g g' of the articulated bars G G', pivoted on the rod g' , as hereinafter described.

While the just described construction results in maintaining all the rollers in the desired relative adjustment with respect to each other in the operations of cracking and grinding, the rollers E' and F' are yet capable of slightly moving still farther forward, (or away from the fixed rollers E F,) should a small hard substance—such as a nail—fall between the adjacent surfaces of the said adjustable and fixed rollers, by means of the yielding of the springs h^2 on the rods H H', described farther on.

The separation of the rollers for the purpose of adjustment in cracking and grinding is thus effected, first describing the preferred means for separating the cracking-rollers E E'. The rear walls of the cases or supports for the sliding boxes e' are provided with threaded perforations to receive set-screws e^3 , as shown in Fig. 4, and the said screws may be turned to the desired point, thus serving further as stops to prevent the said rollers coming together. For the grinding-rollers F F' we provide preferably more elaborate adjusting devices—namely, the wedging-rods J, the upper threaded ends of which are received in the perforated studs b^2 , suitably formed in the sides of the casing B, and are held in place by means of the adjusting and jam nuts j and j' . A

wedge, j^2 , is formed on the lower edge of each of the rods J, and these wedges work between the suitably-beveled ends of the bearing-boxes f and the ends of the studs f^3 , formed on the inner ends of the sliding boxes f' , and projecting through suitable perforations in the rear walls of the cases or supports of said boxes, all as shown in Fig. 4. As the adjusting-screws f^2 are turned so as to permit of the moving of the adjustable grinding-roller F' farther apart from its companion roller F , the lower wedged ends of the rods J are depressed between the rollers as far as the increased limit of distance between the boxes f and studs f^3 will permit; and, on the other hand, the said rods have to be raised when the adjusting-screws f^2 are turned to decrease said distance.

The articulated bars G G' and their connections will next be described. The upper ends of the bars G and the lower ends of the bars G' are provided with smooth sleeves g^2 g^3 , respectively, and through the sleeves g^2 are passed the spring-rods H, while the sleeves g^3 receive the spring-rods H'. On the forward screw-threaded ends of these spring-rods H H' are fitted the hand-wheels h , and their opposite ends are passed through suitable perforations of the rear frame-posts, and each rod is provided with a head, h' , between which and the post a coiled spring, h^2 , is interposed. On the front of the mill-frame a stud, B', projects horizontally out from each side of the casing, and each stud is slotted at b' to receive the rod g' , supported therein, and on the ends of this rod the articulated bars G G' are pivoted, said rod g' being securely held in position by means of the fastening-nuts g^4 . The extreme ends of the studs B' are perforated to receive the journaled ends of the shaft I, to the center of which is keyed the hand-lever I'. Close to each of the journaled ends of the shaft I is provided a cam, i . The normal position of these cams (which may be keyed to or otherwise fastened on the shaft) is with their spurs or points pressing against the rod g' , which is thus held against the inner edge of each slot b' , as shown in Figs. 1 and 3, which serves to maintain the rollers in the adjustment to which they have been brought; but when it is desired to separate the rollers for any purpose, as in starting, or when there is a tendency to clogging, or when a hard substance—such as a bolt or bit of metal, or the like—is accidentally carried in between the adjacent cracking or grinding surfaces of the rollers, then the lever I' is depressed, as shown in Fig. 2, and the cams i are thereby turned with their points thrown outward, and this releases the rod g' , when the force of the springs h^2 h^2 on the rods H H' serves to draw said rods to the rear, and with them the upper ends of the bars G G and the lower ends of the bars G' G', thereby forcing the rod g' forward against the front edge of each slot b' , and as the adjusting-screws e^2 f^2 are located near those ends of the articulated bars G G' which are pivoted on the said rod g' , this action of the said rod g' will serve to move

said pivoted ends of said bars G G' bodily forward, thereby carrying said adjusting-screws also forward, inasmuch as the slots b' are long enough to enable the rod g' to move the pivoted ends of the bars G G' such a distance forward (by the described action of the springs h^2 h^2) as will carry the adjusting-screws e^2 f^2 bodily forward, freeing their inner ends from contact with the sliding boxes $e' f'$, and permit the adjustable rollers E' and F' to be separated from their companion rollers E and F (by the action of the hard substance or other material passing through between the rollers) without injury to their cracking or grinding surfaces or derangement of any part of the machinery. The said rollers are not intended to separate in cracking and grinding after being adjusted, except as above stated, and then only to the limit determined by the position of the screws e^2 and f^2 , with the further first-described provision for a slight yielding, to avoid injury from any small obstruction, after which the rollers can be again brought back into operative position by raising the lever I' again to the position shown in Figs. 1 and 3.

If desired, the upper set of rollers can be provided with wedge-rods J; but we find that ordinarily the set-screws e^3 will serve the purpose, and by the described arrangement the rollers E' and F' can be adjusted independently of each other.

In order to prevent the cracked grain from scattering over the grinding-rollers, we may employ a vertical hopper, K, to inclose the space intervening between the cracking and the grinding rollers. This hopper consists of two boards, k k' , the edges of which are suitably beveled, so as to be brought as close to the rollers as possible without coming in contact with them, and the sides of said boards are suitably fastened in the casing B.

In case at any time the tension of the springs h^2 h^2 should be insufficient, it will be only necessary to turn the hand-wheel nuts h h on the screw-threaded forward ends of the rods H H', and the difficulty will be at once remedied.

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

1. In a roller-mill, the combination of an adjustable cracking-roller and an adjustable grinding-roller, movable sliding bearings wherein said adjustable rollers are mounted, fixed cracking and grinding rollers, an articulated spring-frame consisting of jointed bars, spring-rods passing through the extreme outer ends of said bars, and carrying coiled springs upon their rear ends, a horizontally-moving rod on which said bars are pivoted, the mill-frame having horizontally-projecting slotted studs for the reception of the ends of the said horizontally-moving rod, adjusting-screws carried by the jointed bars of the spring-frame, and a cammed shaft and a lever to regulate the movements of the horizontal rod, substantially as set forth.

2. In a roller-mill, the combination of the ad-

justable and fixed cracking and grinding rollers, articulated spring-frame consisting of jointed bars, spring-rods passing through the extreme outer ends of said bars, and carrying
5 coiled springs upon their rear ends, a horizontally-moving rod on which said bars are pivoted, wedge-shaped bars and set-screw stops, the slotted casing provided with bearings, a suitably-cammed shaft, and an actuating-lever,
10 substantially as and for the purpose set forth.

3. In a roller-mill, the combination of the rollers $E E'$ $F F'$, fixed boxes $e f$, sliding boxes $e' f'$, and the spring-frames consisting of articulated bars $G G'$, provided with sleeves g^2

g^3 , rods $H H'$, having hand-wheel nuts $h h$, 15 heads $h' h'$, and coiled springs $h^2 h^2$, and the adjusting-screws $e^2 f^2$, substantially as shown and described, and for the purpose set forth.

In testimony that we claim the foregoing we have hereunto set our hands, at Milwaukee, 20 in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

FRANK H. BOLTE.
HERMAN G. THEDE.

Witnesses:

S. S. STOUT,
H. G. UNDERWOOD.