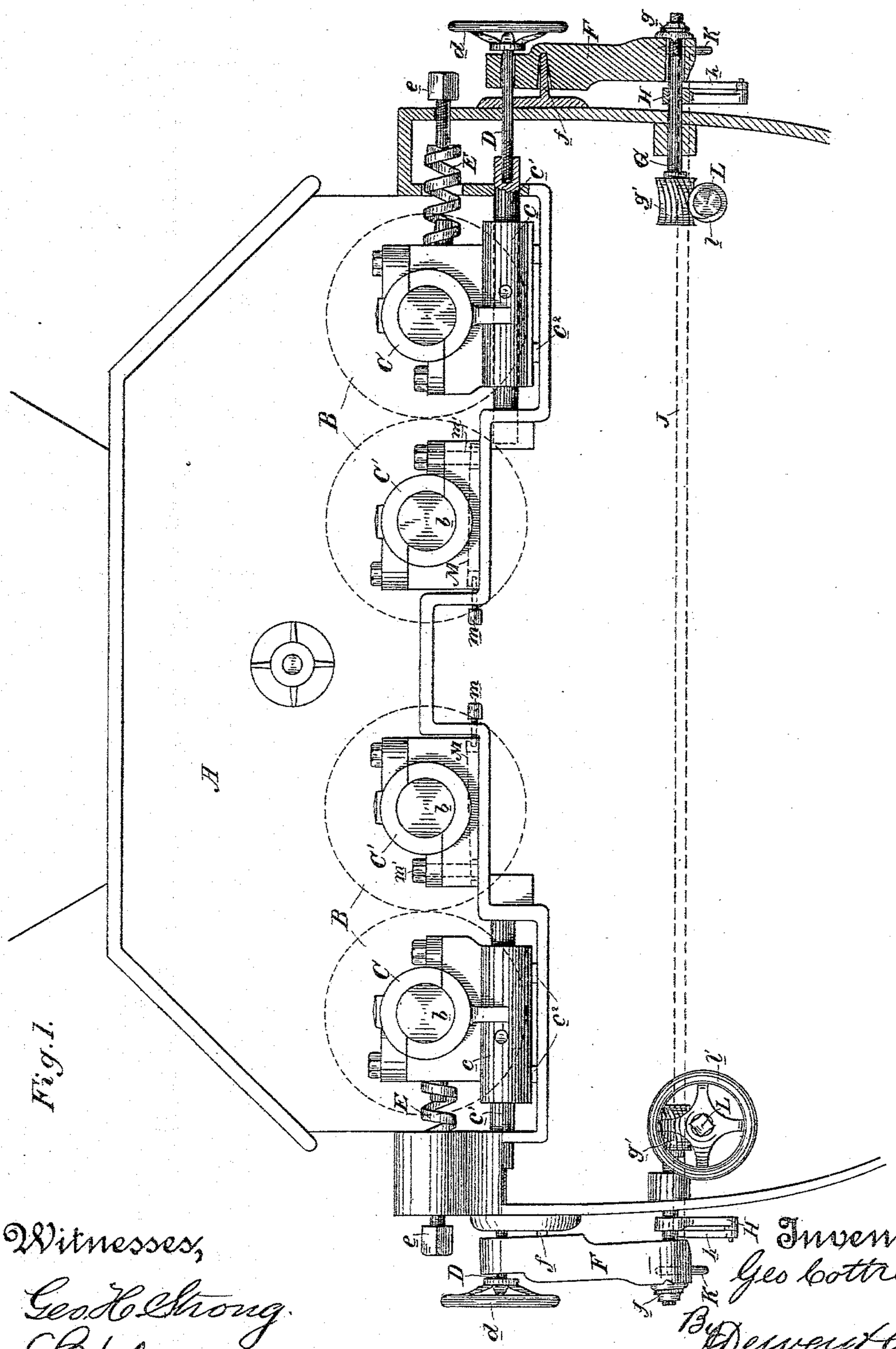
(No Model.) 2 Sheets—Sheet 1.

G. COTTRELL.

ROLLER MILL.

No. 356,623. Patented Jan. 25, 1887.



Witnesses,
Geo. H. Strong.
J. B. Towne

Inventor
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By Dewey & Co.
attys

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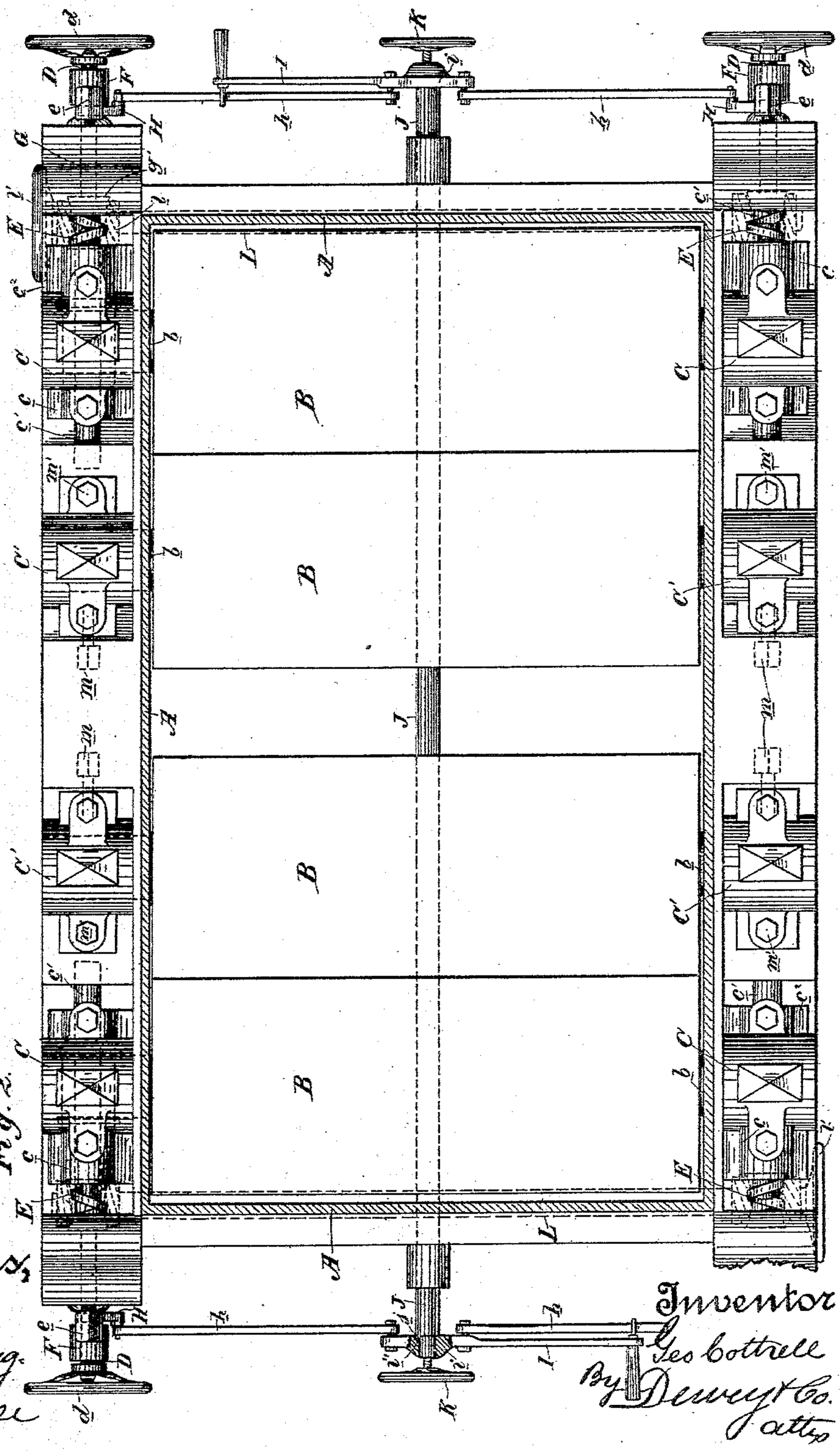
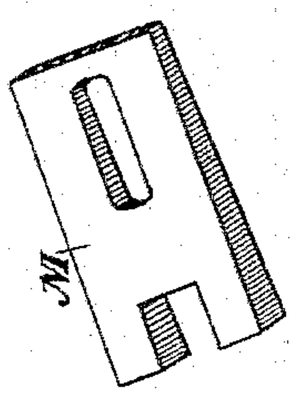


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE COTTRELL, OF SAN FRANCISCO, CALIFORNIA.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 356,623, dated January 25, 1887.

Application filed August 2, 1886. Serial No. 209,917. (No model.)

To all whom it may concern:

Be it known that I, GEORGE COTTRELL, of the city and county of San Francisco, State of California, have invented an Improvement in Roller-Mills; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of machines used in the manufacture of flour which are commonly known as "roller-mills;" and my invention consists in the mechanisms, which I shall hereinafter fully describe and claim, for effecting the various adjustments of the machine.

The object of my invention is to provide simple and effective means for adjusting the rolls of the mill.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is an elevation of my roller-mill, the adjusting mechanism at one end being in section. Fig. 2 is a plan of the roller-mill, partly in section, a portion of the center being left open to show the shaft J. Fig. 3 is a perspective view of one of the wedges used for vertically adjusting the boxes.

A is the frame of the mill, in which is contained the usual parallel rolls, B, whose journals *b* are mounted in the boxes C C′ on the sides of the frame. The inner boxes, C′, have a slight vertical adjustment, as I shall hereinafter explain, and the outer boxes, C, have a horizontal sliding movement in order to adjust their rolls to or from the adjacent ones. The main or principal adjustment of these outer boxes, C, is the one by which their rolls are primarily set up parallel for their work, and I effect this by means of the screw-spindles D, each having a hand-wheel, *d*, on the outer end, and threaded at the inner end in a bar, *c′*, which is secured to the base *c* of the box, said box being mounted and traveling in a suitable frame or seat, c^2, which also serves as a guide for the bar *c′*.

E is a holding-spring for each box C, the tension of which is adjusted by the screw *e*, both spring and screw being above the spindle D. These devices are at each corner of the frame.

By operating the spindles D it will be seen that the boxes C may be adjusted toward or from the boxes C′. When the feed ceases, it is necessary to spread the rolls immediately, in order to prevent their grinding together. In order to accomplish this I have the following mechanism:

F are levers, the upper ends of which are fitted loosely upon the outer ends of the spindles D, just inside of their heads or hand-wheels *d*. These levers are fulcrumed loosely on bearings *f*, hung on the spindles, and through their lower ends loosely pass screws G, on the outer ends of which are fitted nuts *g*, which bear against the outer surfaces of the levers F.

Secured rigidly to the screws G are cranks H, to the lower ends of which are connected rods *h*, the other ends of which are connected with the pivoted operating-lever I at points on each side of the pivotal center of said lever.

When it is desired to spread the rolls quickly, the lever I is thrown over to one side, whereby, through the connecting-rods *h* and the cranks H, the screws G are turned sufficiently to draw in their nuts *g* and cause them to press the lower ends of the levers F inwardly toward the machine. These levers, fulcruming on their bearings *f*, bear with their upper ends against the hand-wheels or heads *d* of the screw-spindles D, whereby said spindles are forced outwardly, thus drawing the boxes C away from their adjacent boxes C′ and spreading the rolls. This mechanism, as described thus far, simply refers to that at one end of the machine. In order to operate these mechanisms at both ends of the machine simultaneously, I have a rock-shaft, J, which passes in suitable bearings longitudinally under the machine from end to end. The hub *i* of each lever I is pivoted loosely on the shaft J, but is thrown into engagement therewith by means of small slots *i′* in said hub engaging projections or lugs *j* on a shoulder near the end of the shaft, said engagement being fixed by means of a hand-nut, K, screwed into the end of the shaft and bearing against the hub of the lever I. This fixes the lever to the shaft. As shown in Fig. 2, the other end of the shaft J is provided with similar mechanism. Now, it will be seen that by operating the lever I at one end of the machine the shaft

J is oscillated, so that the spreading effect which has been heretofore described takes effect at both ends of the machine, thus providing for the adjustment of both sets of rolls at once. When it is desired to operate only one end, the hand-nut K is turned back, so that the hub of the lever I may be withdrawn from its engagement with the shaft J and pivot loosely thereon. After the main adjustment through the screw-spindles D has been effected and the rollers are exactly parallel, it is often necessary to withdraw the sliding rolls slightly for the purpose of accurately setting them. In order to accomplish this I have on the inner ends of the screws G worm-pinions g', with which mesh worms l on shafts L, passing transversely under the machine at each end, and having on their ends the hand-wheels l'. By operating these wheels the screws G are slightly turned, and this movement, through the levers F, causes the adjustment or setting of the rolls.

The inner boxes, C', of each set of rolls have, as I have before stated, a vertical adjustment in order to level them. This is usually accomplished by means of screws passing up from below and bearing on the under surfaces of the boxes. Instead of these means, I provide a wedge, M, for each inner box, which is inserted under the box, and is operated by a screw, m, bearing against its thick end, said wedge being guided in its movement, by being slotted, over a pin or screw, m', which passes up through it from below. By properly moving this wedge the vertical adjustment of the box may be easily and accurately effected.

It will be observed that in my machine the screw-spindles D do not pass through the holding-springs E of the boxes, but are under them and entirely separated therefrom.

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

1. In a roller-mill, the sliding boxes C and the spindles D, connected with the boxes, in combination with the means for spreading the rolls, consisting of the pivoted levers F, mounted at their upper ends on the spindles D, the screws G and nuts g in the lower ends of the levers, the cranks H on said screws, the pivoted lever I, and the connecting-rods h, all arranged and adapted to operate substantially as herein described.

2. In a roller-mill, the sliding boxes C, having guide-bars c', the spindles D, screwed into the ends of the bars, and having heads d, by which they are operated to adjust the rolls primarily, in combination with the means for spreading the rolls, consisting of the levers F, mounted loosely at their upper ends on the spindles D, the screws G and nuts g at the lower ends of the levers, the cranks H on said screws, the pivoted lever I, and the connecting-rods h, substantially as herein described.

3. In a roller-mill, the sliding boxes C and the spindles D, connected therewith, in combination with the pivoted levers F, secured at their upper ends on said spindles, the screws G and nuts g at the lower ends of the levers, the cranks H on said screws, the levers I, the connecting-rods h, the rock-shaft J, passing under the machine, and an adjustable connection between the levers I and the ends of the shaft J, whereby one or both sets of rolls may be spread, substantially as herein described.

4. In a roller-mill, the sliding boxes C and the spindles D, connected therewith, in combination with the pivoted levers F, secured at the upper ends to the spindles, the screws G and nuts g at the lower ends of the levers, the cranks H on the screws, the levers I and connecting-rods h, the rock-shaft J under the machine, and an adjustable connection between the levers I and the ends of the shaft J, consisting of the slotted hubs i of the levers, the lugs j on the shaft, and the hand-nuts K, substantially as herein described.

5. In a roller-mill, the sliding boxes C and the spindles D, connected therewith, in combination with the pivoted levers F, secured at their upper ends on the spindles, the screws G and nuts g at the lower ends of the levers, the worm-pinions g' on said screws, the cross-shafts L, and the worms l on said shafts, meshing with the pinions g', whereby the rolls may be adjustably set, substantially as herein described.

In witness whereof I have hereunto set my hand.

GEORGE COTTRELL.

Witnesses:
S. H. NOURSE,
H. C. LEE.