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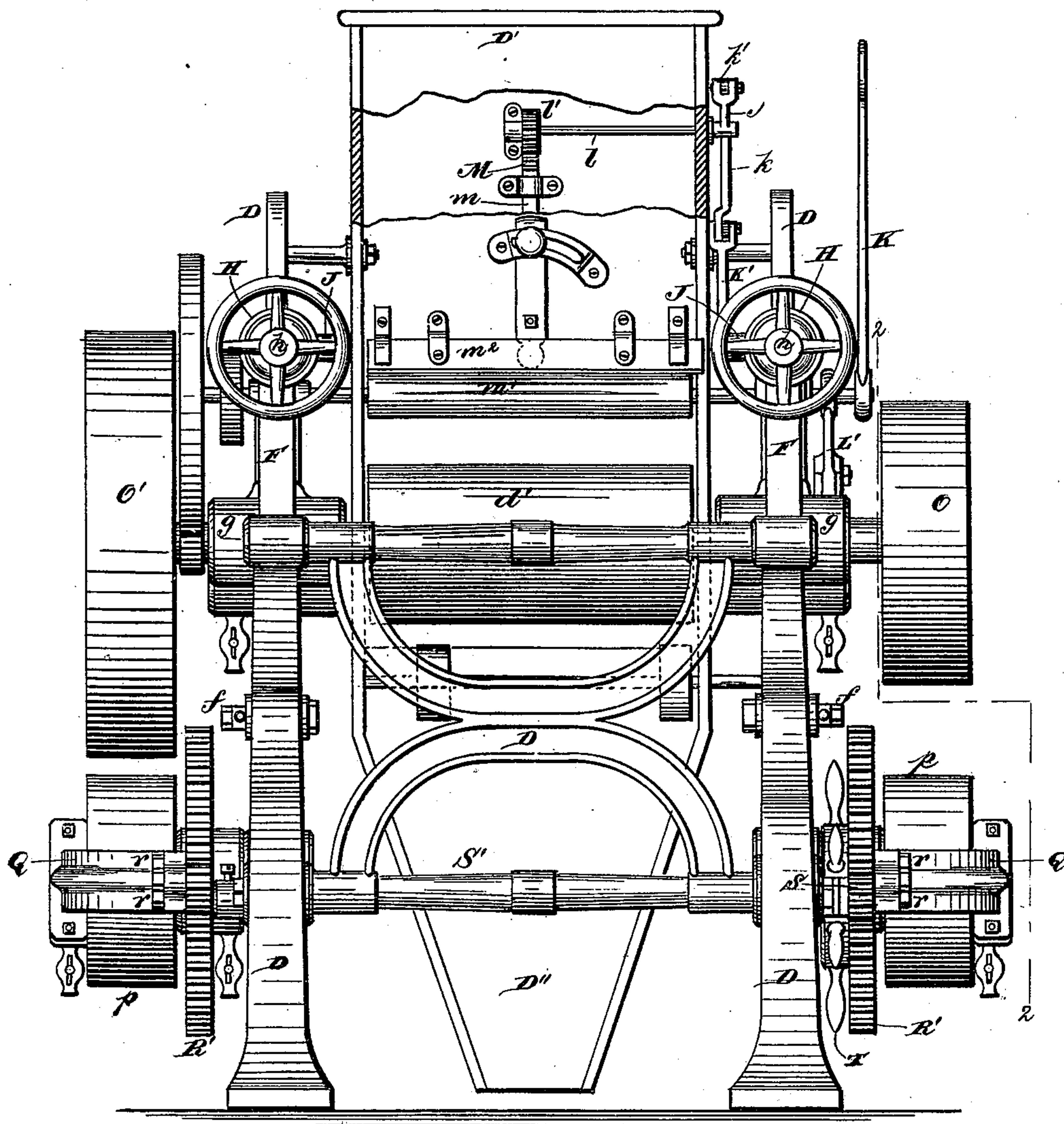
4 Sheets—Sheet 1.

U. H. ODELL.
ROLLER MILL.

No. 250,954.

Patented Dec. 13, 1881.

Fig. 1.



Witnesses.

Robert Corrett.

J. A. Rutherford

Inventor.
Udolpho H. Odell

By

Wood & Boyd,
Attys.

(No Model.)

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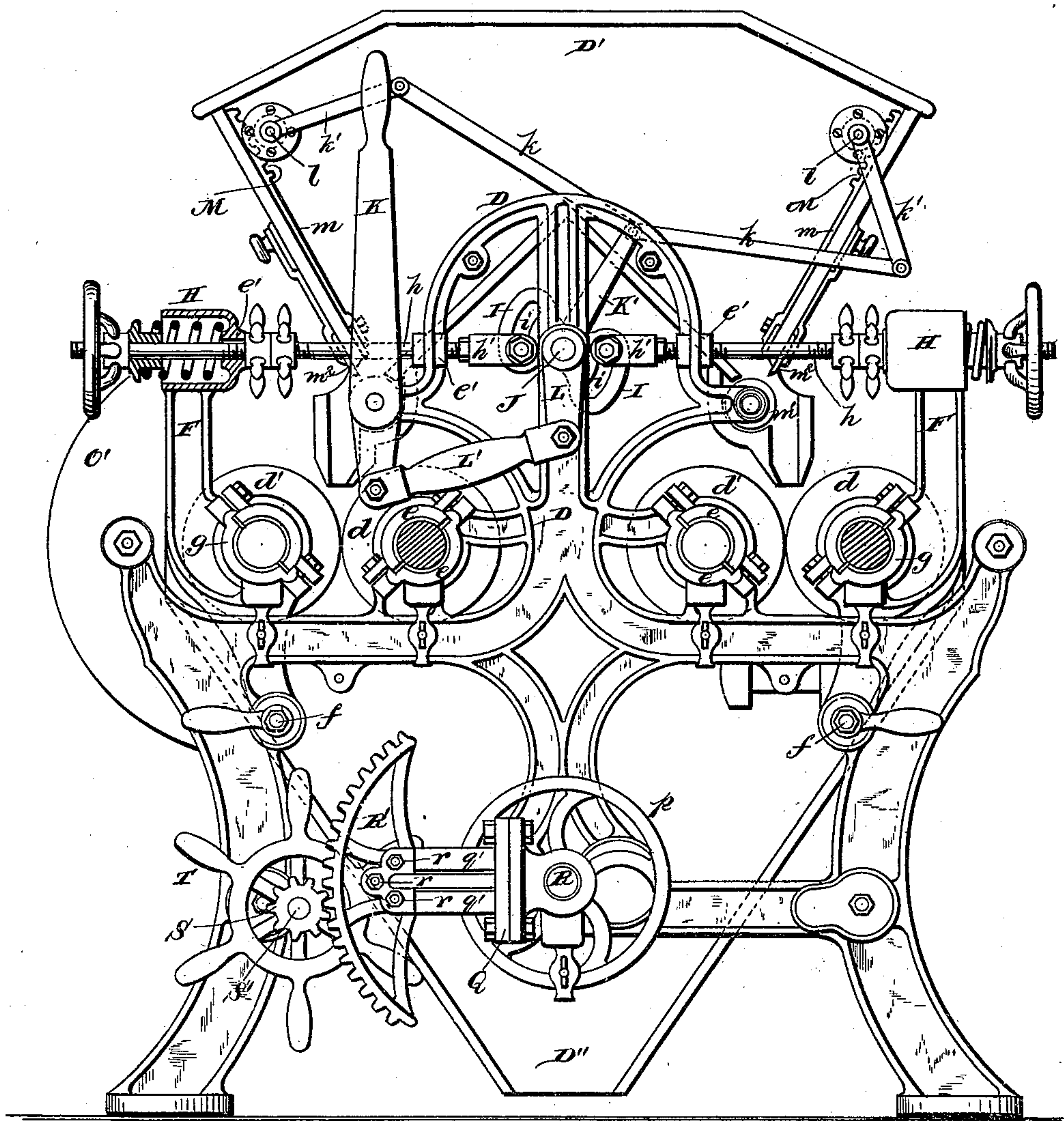
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Fig. 2.



Witnesses.

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J. A. Rutherford

Inventor:

Udolpho H. Odell,

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(No Model.)

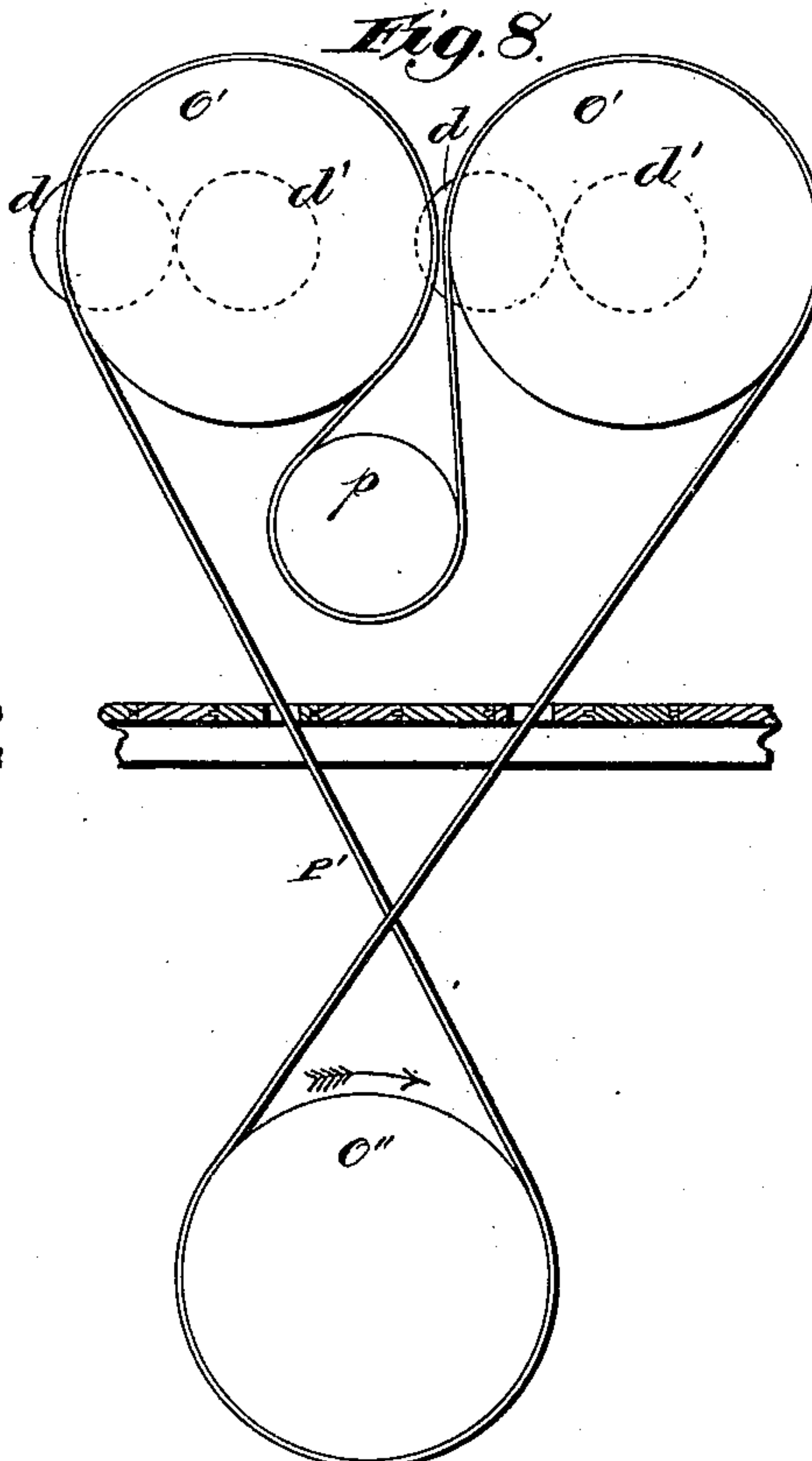
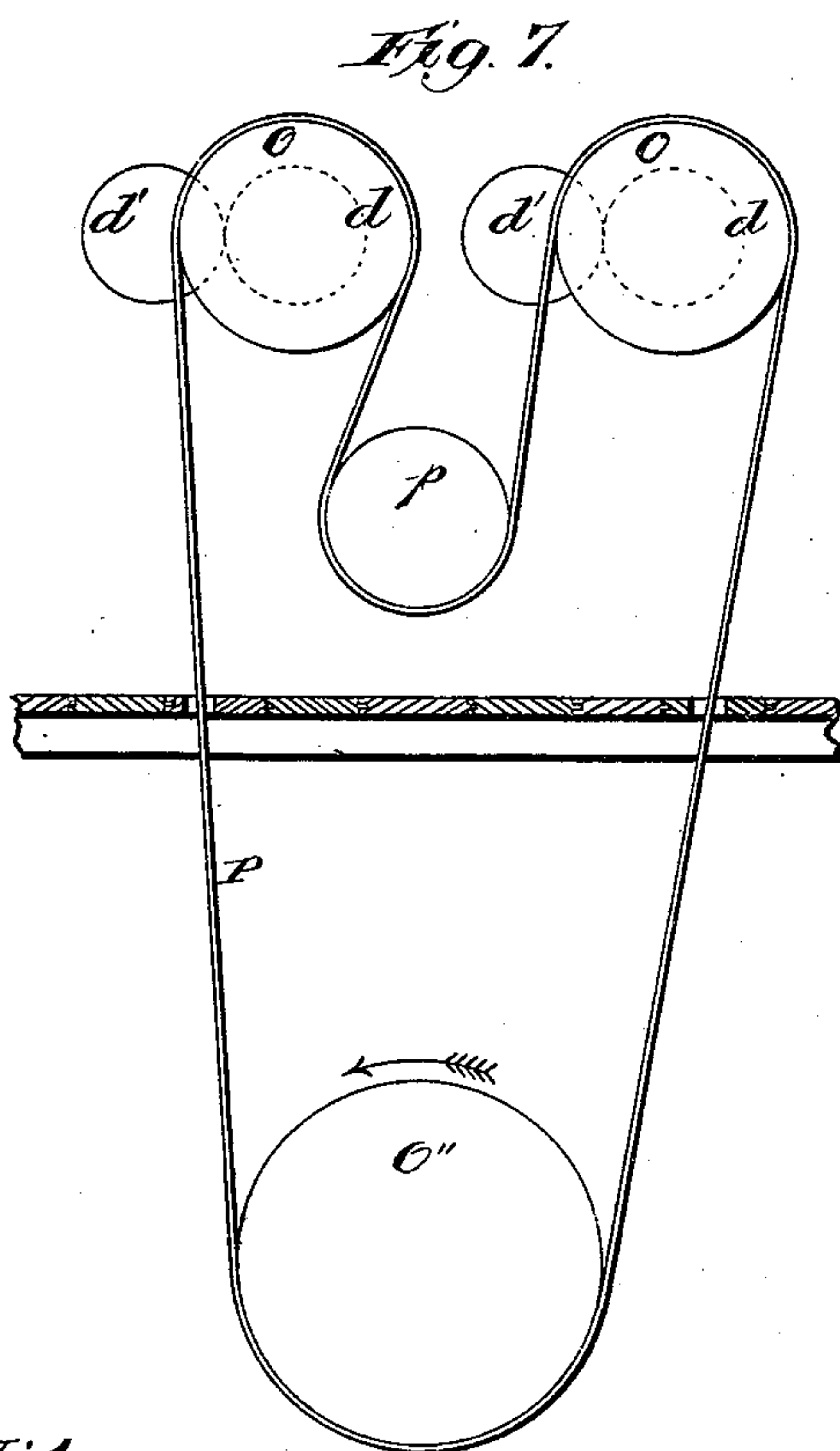
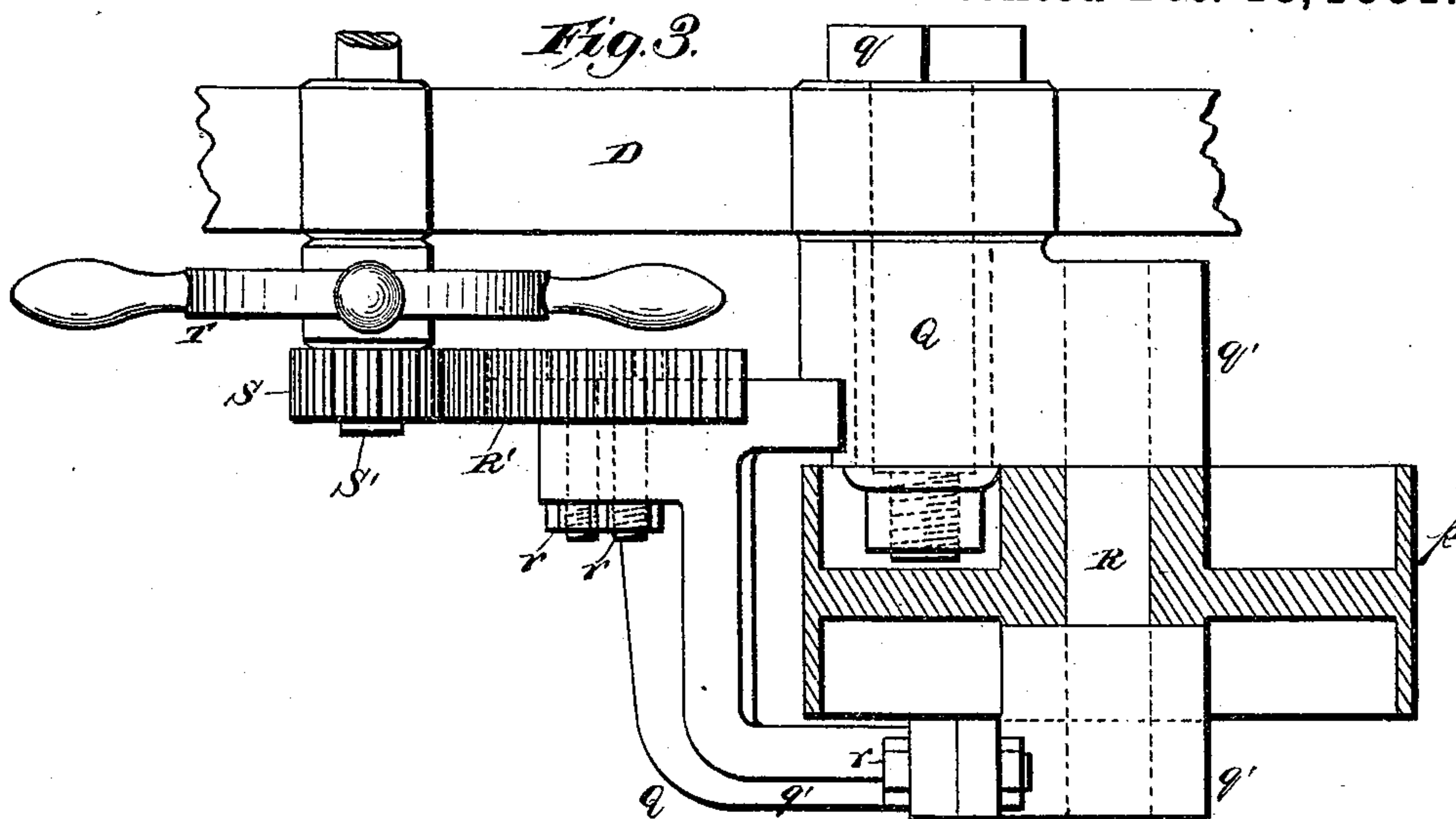
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(No Model.)

4 Sheets—Sheet 4.

U. H. ODELL.

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Fig. 4.

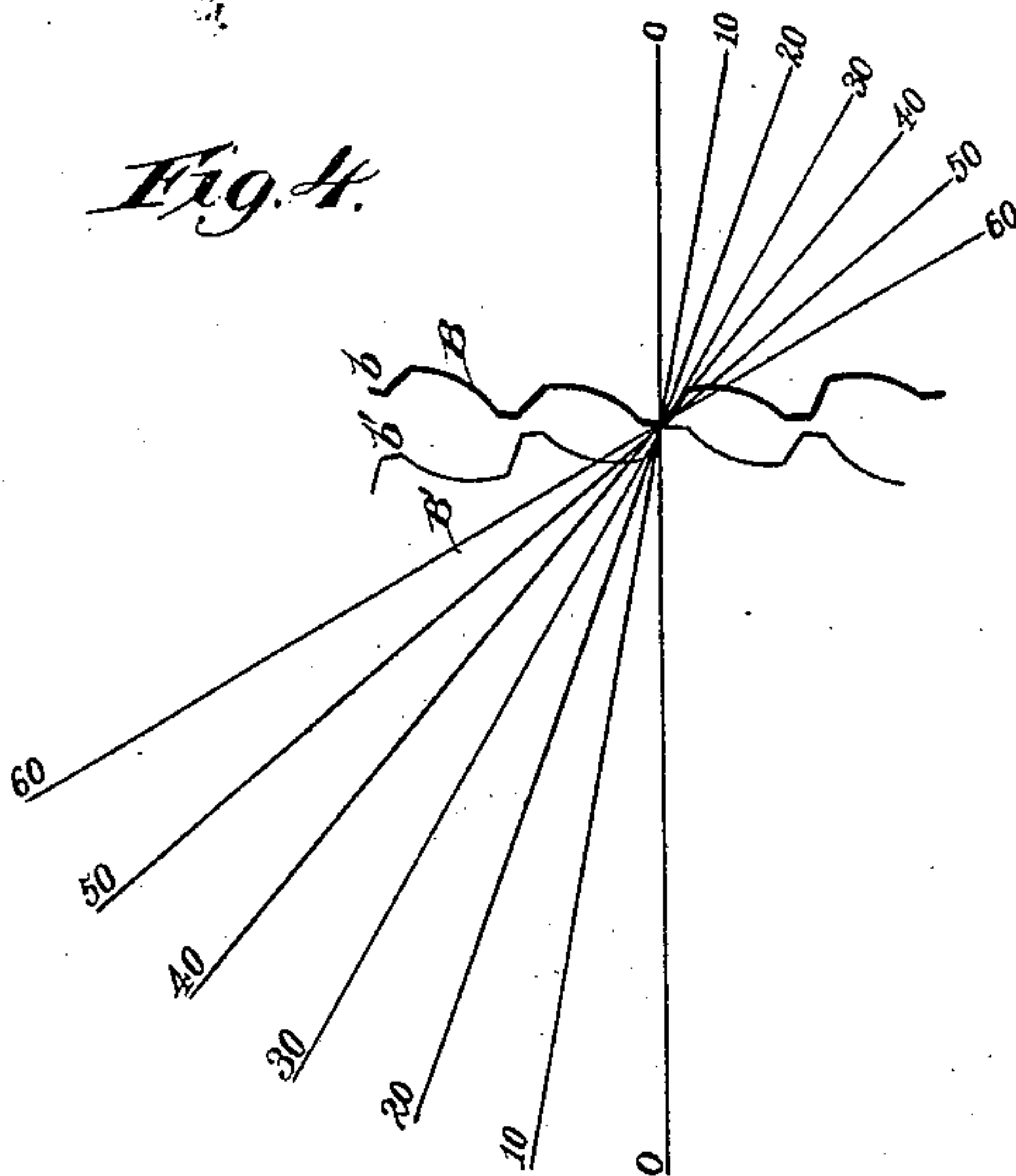


Fig. 5.

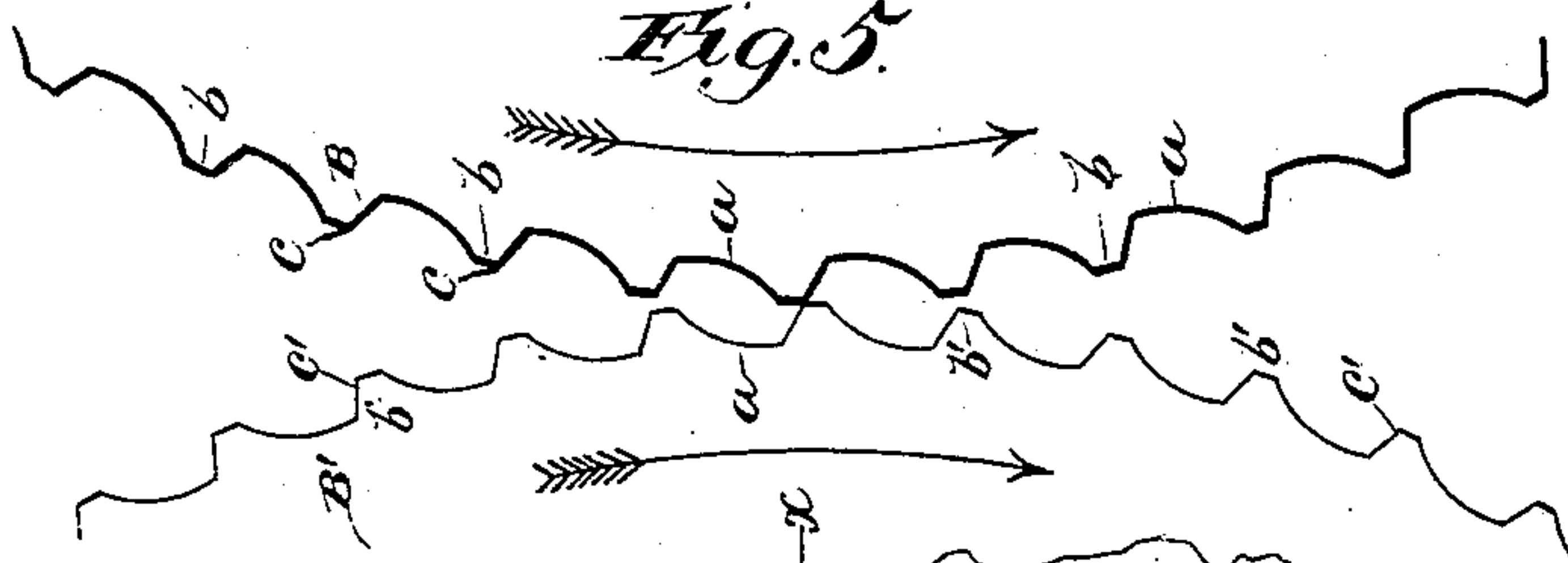
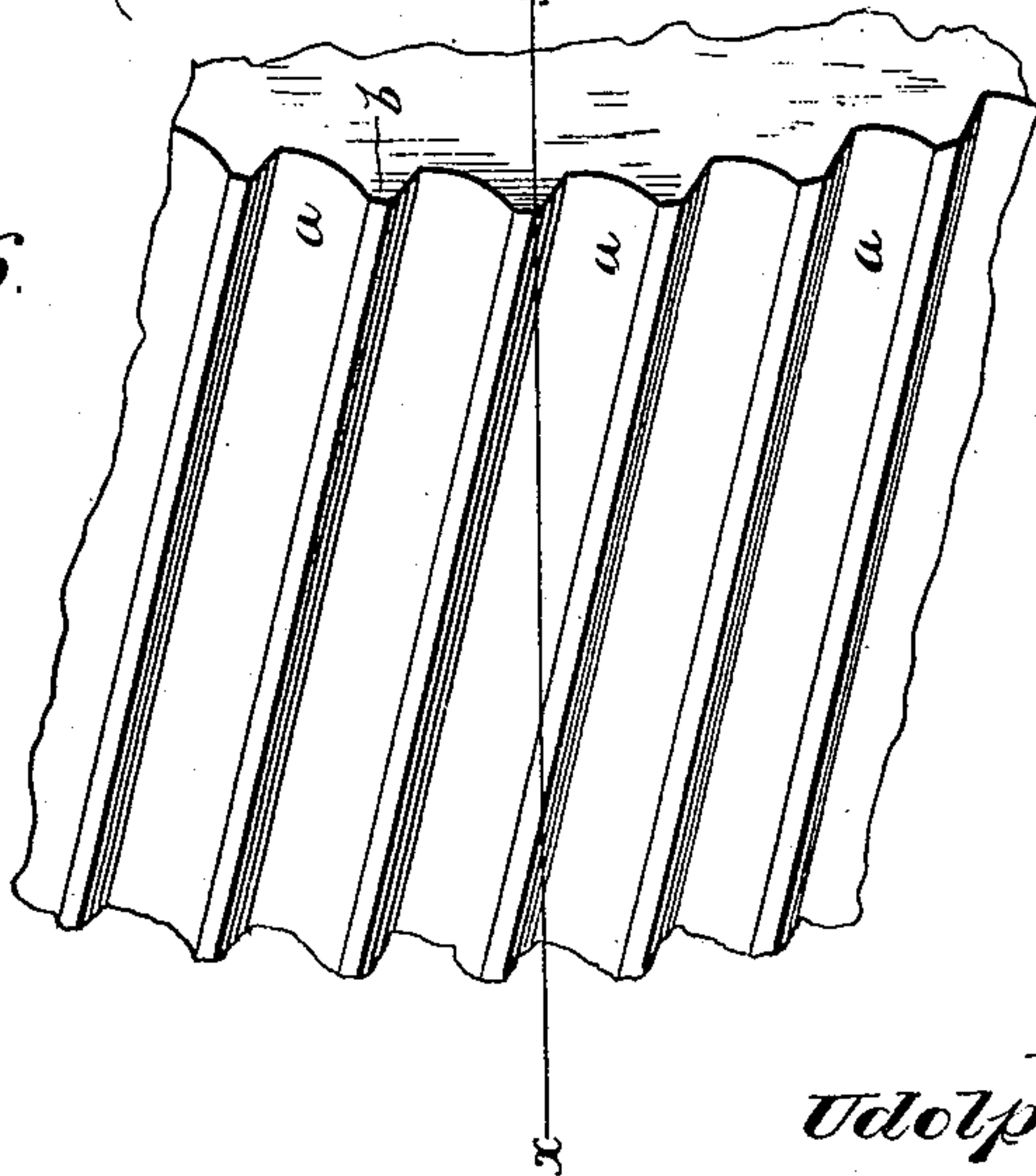


Fig. 6.



Witnesses.

Robert Everett.

J. A. Rutherford.

Inventor.

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UNITED STATES PATENT OFFICE.

UDOLPHO H. ODELL, OF MINNEAPOLIS, MINNESOTA.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 250,954, dated December 13, 1881.

Application filed July 7, 1881. (No mod l.)

To all whom it may concern:

Be it known that I, UDOLPHO H. ODELL, citizen of the United States, and a resident of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Roller-Mills, of which the following is a specification.

My invention relates to improvements in roller-mills for crushing or grinding grain, middlings, and other material.

My invention relates to means for simultaneously adjusting one set of the crushing or grinding rolls to or from the other, and by the same movement to open or close the spouts or channels which admit the grain from the hopper to the feed-rolls. This feature of my invention consists in the combination of a through-shaft, pivoted cranks, links, racks, and pinions, all of which will be more fully explained in the description of the accompanying drawings.

The object of my invention is to provide novel means for instantaneously stopping the grinding operation by the movement of a single band-wheel or lever for cutting off the supply of grain and opening or separating the crushing-rolls without stopping the motion of the machinery, and in the same manner putting the machine again into operation.

Other features of my invention will be more fully set forth in the description of the accompanying drawings, in which—

Figure 1 is an end elevation of a four-roll crushing or grinding mill embodying my invention. Fig. 2 is a side elevation of the same on the line 2 2 of Fig. 1, the pulleys to the right of said line being omitted in order to more clearly illustrate the parts. Fig. 3 is a detail plan view of one of the tightening-pulleys and its supporting-frame. Figs. 4 and 5 illustrate the form of the ribs and grooves which constitute the peripheries of the crushing or grinding rolls. Fig. 6 is a broken section of the face of one of the crushing or grinding rolls, the line $x x$ representing the plane of its axis. Fig. 7 is a diagram showing the arrangement of the fast-speeded crushing or grinding rolls and belt-connections. Fig. 8 is a similar view to represent the opposite side of the machine.

In the accompanying drawings, the letters $b b'$ indicate the ribs, and a the grooves between the ribs, which form the face of each of the crushing or grinding rolls.

c indicates the forward point or cutting-edge of the rib b , and c' indicates the rear cutting-edge of the rib b' . These cutting-edges are formed by the bevel of the rib, which is shown at an angle of thirty degrees from the plane of the axis of the rollers and is the preferred form; but these bevels may be formed at other inclinations, as represented by the protracted lines in Fig. 4. It will be observed that the faces of the ribs $b b'$ are parallel to each other when in the same plane; but as the ribs b travel faster than the ribs b' , the former approach the latter in converging lines and crush or mash the grain or material between them.

D indicates the frame-work of the machine; D' , the hopper, and D'' the discharge-chute beneath the crushing or grinding rolls.

$d d$ indicate the fast-speeded, and $d' d'$ the slower-speeded, crushing or grinding rolls.

e indicates the journal-bearings for the two inner rolls, which are rigidly attached to the frame D of the machine.

The letters F indicate oscillating or swinging arms, pivoted at their lower ends to the frame of the machine by bolts, as at f . g indicates the journal-bearings for the two outer rolls, $d d'$.

$H H$ indicate housings cast or otherwise provided on the upper ends of the arms F .

$h h$ indicate two horizontal shafts, supported in bearings $e' e'$ in the housings H and on the frame D , the inner ends of which shafts $h h$ are forked and engage the segmental cam-slots i in the links I by a bolt which passes through the forks h' and through the said slots. The links I are keyed upon a through-shaft, J , to which latter is also keyed a crank, L .

L' indicates a link-rod connecting the crank L with the vertical pivoted hand-lever K .

K' indicates another crank keyed upon the through-shaft J , inside of the link I and opposite the crank L .

The letters $k' k'$ indicate crank-rods pivoted at one end to the links $k k$, which latter are both attached to the crank K' , and the other ends of the said crank-rods are connected with the shafts l , which are journaled in the sides of the hopper. Upon the shafts l , within the hopper, are fixed the pinions l' , which mesh into the racks M on bars m , which carry at their lower ends the gates or slides m^2 . These slides, when in a closed position, rest upon feed-rollers m' of the usual construction, and serve to

close up the spout or feed-channels which conduct the grain from the hopper to the feed-rollers, from which the grain is discharged between the crushing-rolls.

5 The crushing or grinding rolls $d d'$ are mounted on through-shafts having bearings at each end similar to those shown in Fig. 2, and the shaft J passes through to the opposite side of the machine and has duplicate links I, connecting-
10 rods, and cranks connected with forked shafts and to pinions in the same manner as shown in Fig. 2.

When the hand-lever K is pulled toward the operator an outward-swinging motion is imparted to the pivoted arms F, which support
15 the outer rolls, $d d'$, through the instrumentality of the link L', crank L, through-shaft J, link I, and shafts h , thereby forcing the said outer rolls, $d d'$, away from the inner rolls. Simultaneously with such movement of the lever
20 K and the other parts specified the gates or slides m^2 are moved down upon the feed-rollers m' through the instrumentality of the shaft J, links k , crank-rods k' , shafts l , pinion l' , racks
25 M, and bars m , whereby the feed spouts or channels are closed.

Figs. 7 and 8 represent the preferred form of driving-pulley mounted on one of the shafts of the fast-speeded rolls, and a similar pulley of
30 the same size is mounted on the other shaft. At the opposite end of the machine two pulleys, O', of a sufficiently large size to obtain the requisite slow speed are mounted on the shafts of the slow-speeded rolls. These two sets of
35 pulleys O O' are driven by separate driving-belts from a main shaft.

P P' indicate the belts.

p indicates the tightening-pulleys; Q, pivoted forked levers; q , the pivot-bolts by which
40 they are attached to the main frame, and q' q' the forked ends of the levers.

R indicates the shafts on which the tightening-pulleys p are journaled, and R' segmental gears attached to the ends of levers Q
45 by means of bolts $r r$.

S indicates pinions keyed to the through-shaft S', which is journaled in or on the frame D.

T indicates a hand wheel or lever keyed to the through-shaft S', which shaft passes across
50 the frame of the machine transversely from end to end, as shown in Fig. 1. The two tightening-pulleys p can be adjusted to or from the belts P P' by rotating the shaft S' through the instrumentality of the rotating hand-wheel T,
55 which has the effect of swinging the forked levers Q on their pivot-bolts q , (see Fig. 3,) and either raising or lowering the forked ends of the levers which carry the shafts R of the tightening-pulleys, according to the direction
60 in which the shaft S' is rotated by the hand wheel or lever T.

Fig. 7 shows the mode of belting from the main-frame pulley O'' to the pulleys O O of the fast-speeded rolls, with the tightening-pulley in position to drive the same. Fig. 8 is a
65 similar plan of driving the slow-speeded rolls, the only difference being in the size of the pul-

leys to obtain the two different speeds at which the crushing or grinding rolls are driven.

Instead of arranging the belts P P' to run
70 one over the fast-speeded rolls, the belts may be each made to drive one fast and one slower speeded roll by changing the size of the pulleys, so that each set of crushing-rollers are driven by belts at the opposite ends of the
75 machine, as the tightening-pulley P will permit either belt to run over pulleys O O' O''. This manner of belting the crushing or grinding rolls, in order to drive them with varying
80 or differential speed, is not, however, herein claimed, and is only here illustrated to give a clear conception of the entire structure. Although I have specifically described and illustrated a peculiar form of dress for the crushing or grinding rolls, I do not here claim the
85 same, as such will form the subject-matter of a separate application for Letters Patent.

What I claim is—

1. In a roller-mill, the shaft J, provided with the rigidly-attached link I, having segmental slots i , combined with the shafts h , engaging the slots in said link, the pivoted arms
90 F, carrying crushing or grinding rolls, the crank L, attached to the shaft J, the link L', and the swinging lever K, all substantially as
95 and for the purpose described.

2. The combination, with the swinging lever K and mechanism, substantially as described, for adjusting the outer crushing-rolls, $d d'$, of the crank K', the links k , the crank-
100 rods k' , the shafts l , pinions l' , the racks, and the bars m , provided with the gates or slides m^2 , the construction and arrangement being such that a movement of the swinging lever
105 simultaneously adjusts the crushing or grinding rolls and raises or lowers the gates or slides, for the purposes set forth.

3. In a roller-mill, the combination, with two sets of differential crushing-rolls, of the tightening-pulleys $p p$, a single through-shaft,
110 on which both of said pulleys are mounted, a hand wheel or lever connected with the through-shaft for simultaneously raising or lowering both pulleys, and connecting mechanism between the crushing-rolls and the said
115 pulleys, substantially as and for the purpose described.

4. In a roller-mill, the combination, with the adjustable crushing-rolls and the gates or slides which control the passage of grain from
120 the hopper, of a single through-shaft, J, a single hand-lever, K, and mechanism connecting the crushing-rolls and the gates or slides with the through-shaft and hand-lever, substantially as described, whereby a single move-
125 ment of the lever simultaneously adjusts the rolls and the gates or slides, as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

UDOLPHO H. ODELL.

Witnesses:

O. M. GOTTSCHALL,
E. R. STILWELL.