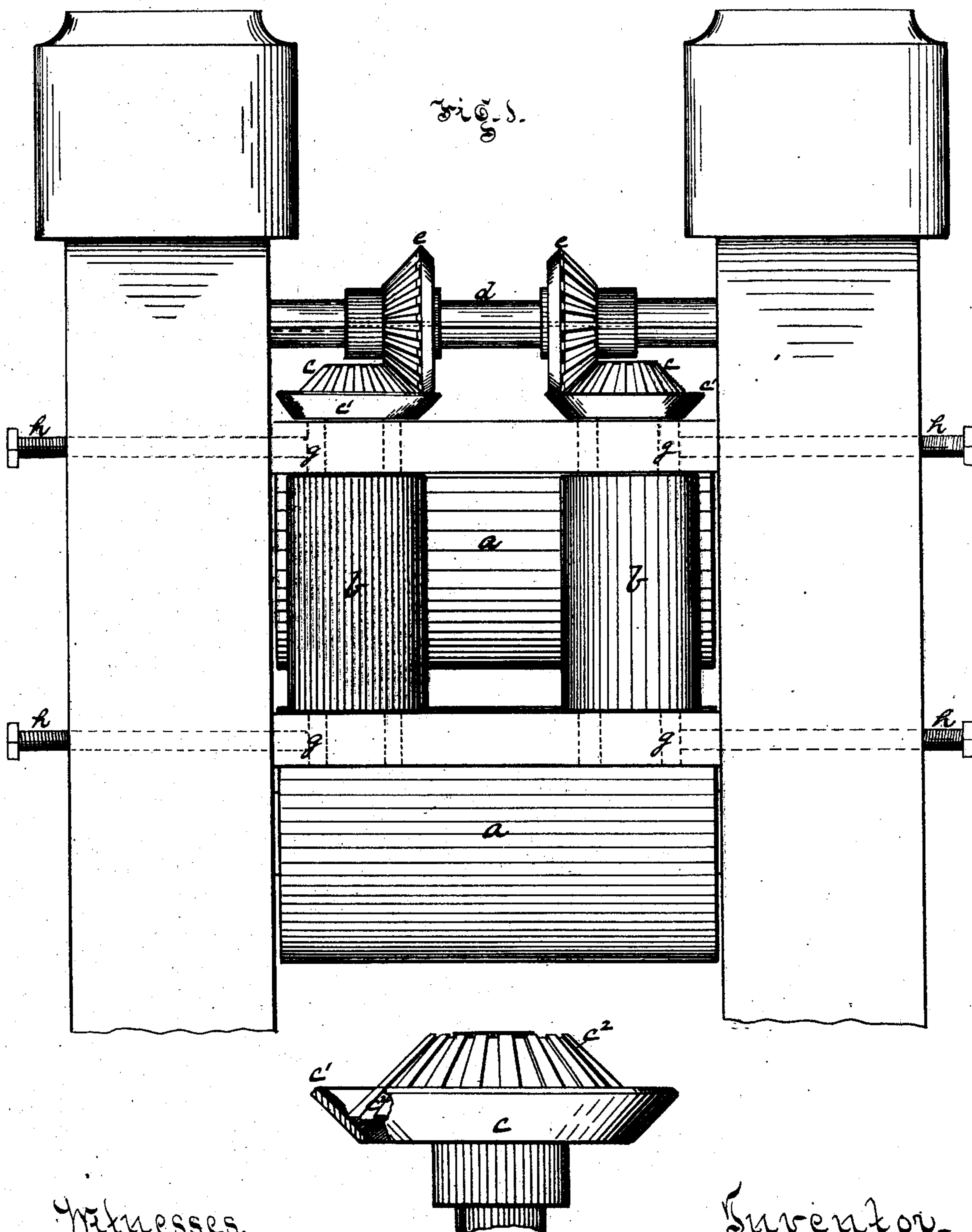


(No Model.)

H. H. LYON.  
BEVELED GEAR WHEEL.

No. 244,815.

Patented July 26, 1881.



Witnesses.  
Jno. Smith  
J. A. Carlin.

Inventor.  
Henry H. Lyon  
by his Attorneys  
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# UNITED STATES PATENT OFFICE.

HENRY H. LYON, OF ALLEGHENY, PENNSYLVANIA.

## BEVELED-GEAR WHEEL.

SPECIFICATION forming part of Letters Patent No. 244,815, dated July 26, 1881.

Application filed January 14, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY H. LYON, of the city of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Beveled-Gear Wheels; and I do hereby declare the following to be a full, clear, and exact description thereof.

In a common form of that class of rolling-mills called "universal mills" the vertical rolls are driven by gearing and counter-shafts from the horizontal rolls. The counter-shafts extend through the upper part of the housing, and are connected to and drive the vertical rolls by means of sliding beveled-gear wheels mounted on said shafts, meshing into beveled-gear wheels placed on the upper ends of the vertical roll-shafts. The adjustment of the vertical rolls to widen or narrow the pass is effected by adjusting-screws passing through bearings at the lower ends of the vertical rolls. The pinions of the counter-shafts are placed inside of the vertical rolls to enable the rolls to be adjusted, and are provided with a feather and spline to cause them to turn with the shafts. They are adjusted longitudinally of the shafts with the vertical rolls by means of a fork and strap connected to the movable bearings below, which fork takes into a groove made in the hollow shaft of the bevel-pinion. This construction necessitates making the upper pinions with long hollow shafts, which extend over the bevel-pinions of the vertical rolls and afford space for the before-mentioned groove in that part of said hollow shaft that extends toward the housing beyond the upper end of the vertical roll. This extension of the hub of the pinion increases the amount of material in the casting, and the whole construction is open to the objection that there is a large amount of slack, which is increased by wear, that tends to the loose and shakely action of the parts and greatly increases the wear. The result is that in the adjustment, the gear-wheels not being held up closely to each other, and tending by their bevel form to be pressed away from each other, the teeth wear unevenly throughout their length and are liable to be broken off near the apex of the wheel, and thereby frequently necessitate the stoppage of the mill. To obviate these various difficulties I have devised my improvement, which I will now describe by reference to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section,

of a universal mill provided with my improvement, and Fig. 2 is a separate view of my improved pinion.

Like letters of reference indicate like parts in each.

My invention consists of forming the bevel-pinions of the vertical rolls with a projecting flange, skirt, or shrouding, which, overlapping the contiguous edge of the intermeshing gear-wheel, will, when adjusted laterally, carry the driving-wheel with it, and thus obviate the necessity of a separate adjusting mechanism for the pinions of the driving-shaft.

In the drawings, *a a* indicate the horizontal rolls; *b b*, the vertical rolls; *c*, the bevel-pinions on the upper ends of the vertical rolls; *d*, the counter-shafts provided with bevel-pinions *e*, for driving the vertical rolls by power taken from the horizontal rolls through suitable gearing; *g*, the adjusting-bearings of the vertical rolls, and *h* the adjusting-screws.

The bevel-pinions *c* are each provided with a skirt, flange, or shrouding, *c'*, extending diagonally upward and outward from the base of the wheel and the lower end of the teeth *c*. The bevel-gear wheel *c* is set in the recess or trough formed by the inclined toothed sides of the wheel *c* and the flange *c'*, and the flange *c'* then overlaps its edge, so that if either vertical roll is moved it will carry along with it its intermeshing pinion *e*. The pinion *e* is free to move along the counter-shaft *d*, and, resting, as it does, between pinion *c* and its skirt *c'*, it will always be held up to its position and have little or no slack. It will consequently wear evenly, and not be liable to be broken or chipped off at the teeth. The flange *c'* is preferably cast with the wheel.

This improvement is also applicable to all places where bevel-gearing is used—such as with shafting for various purposes. It holds the pinions up together, obviating the necessity of using independent devices for that purpose, and prevents wear.

What I claim as my invention, and desire to secure by Letters Patent, is—

A bevel-pinion having a projecting flange or skirt fitted to overlap the contiguous edge of an intermeshing wheel, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand.

Witnesses: HENRY H. LYON.  
PHILIP ITTEL, Jr.,  
L. M. VANDENT.