J. C. ROBERTS.

Grinding Mill.

No. 50,274. Patented Oct. 3, 1865.

Fig: 1.

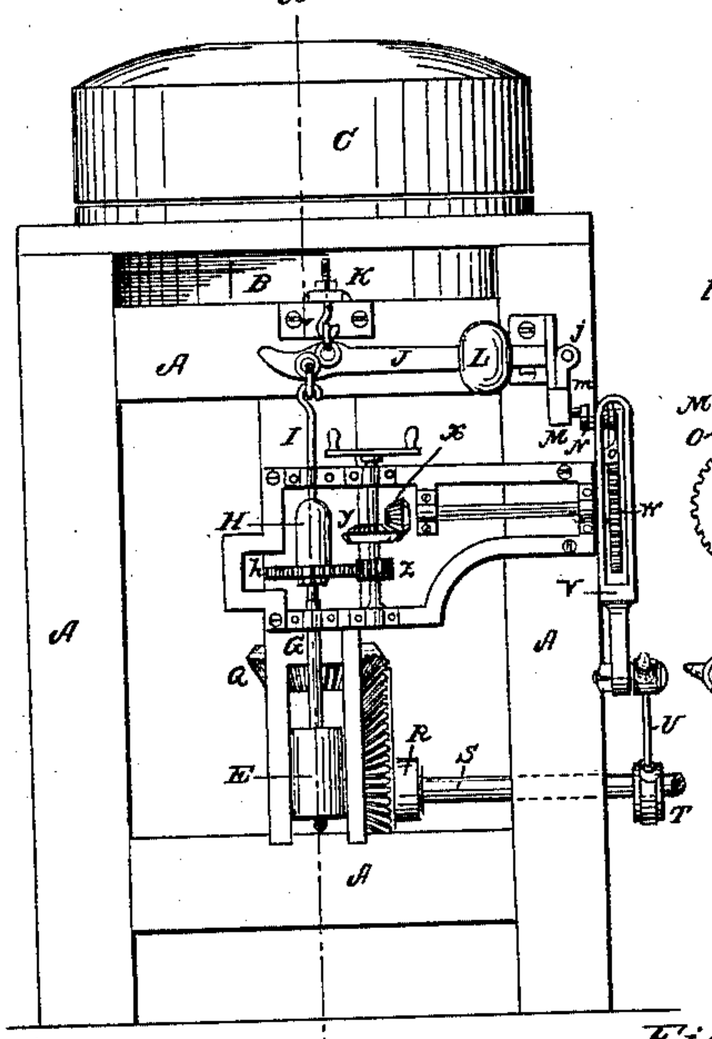


Fig: 2.

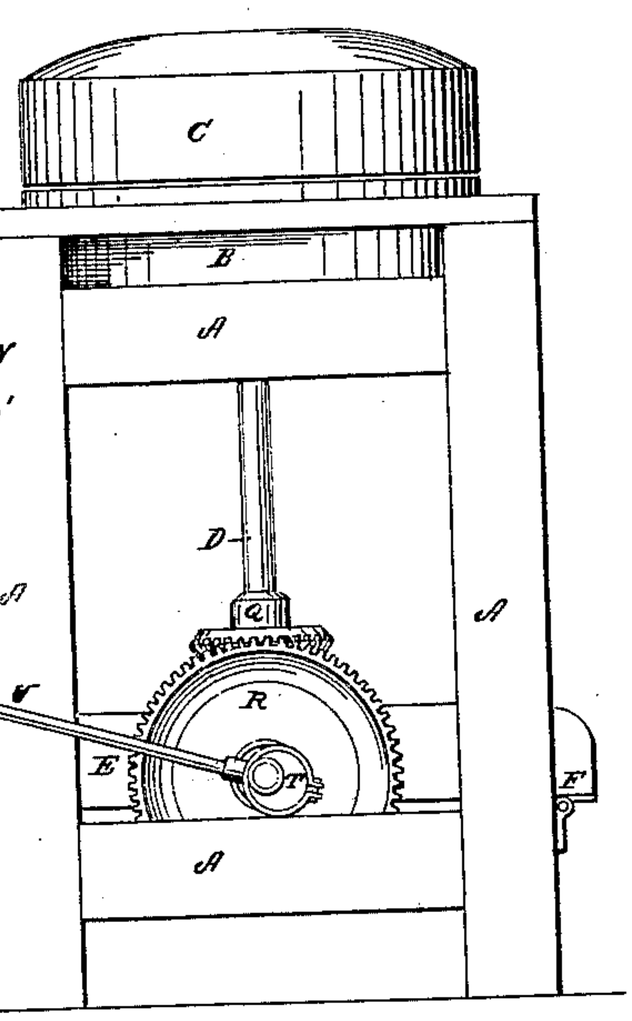


Fig: 3.

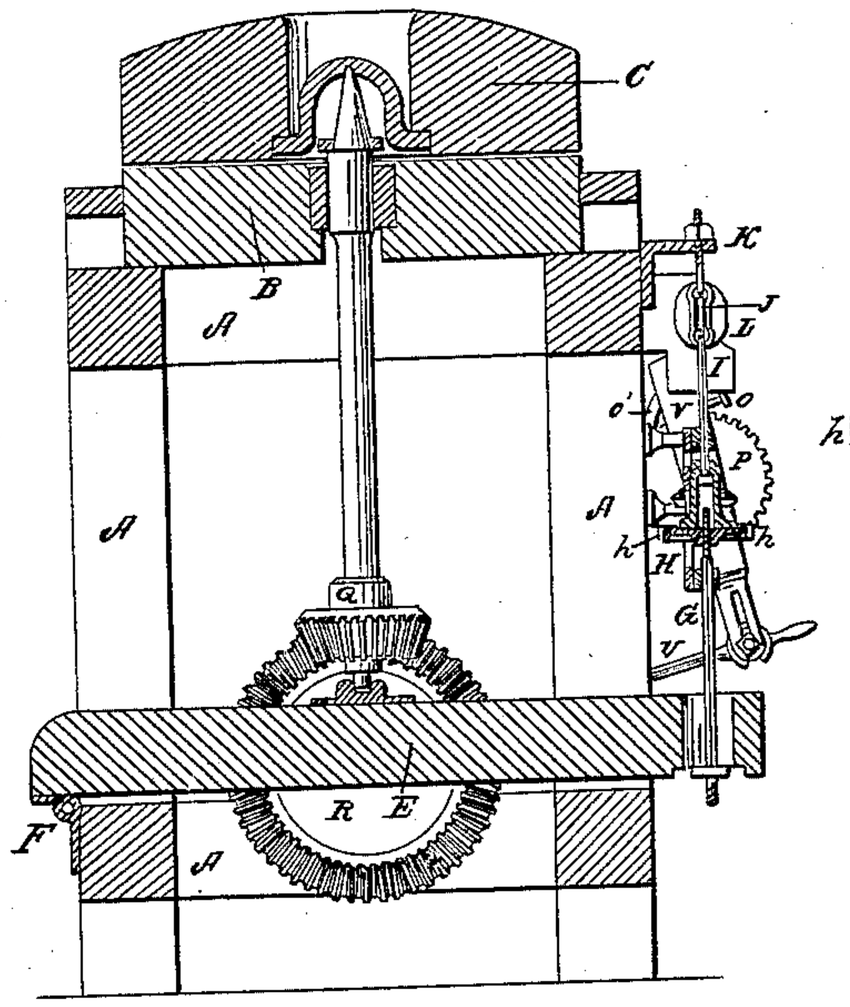


Fig: 5.

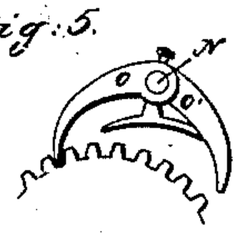


Fig: 6.

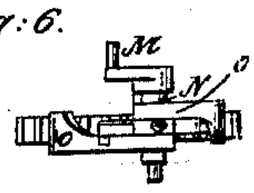
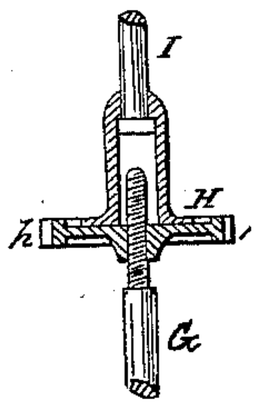


Fig: 4.



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UNITED STATES PATENT OFFICE.

JAMES C. ROBERTS, OF ADAMSTOWN, MARYLAND.

IMPROVEMENT IN GRINDING-MILLS.

Specification forming part of Letters Patent No. **50,274**, dated October 3, 1865.

To all whom it may concern:

Be it known that I, JAMES C. ROBERTS, of Adamstown, in the county of Frederick and State of Maryland, have made certain new and useful Improvements in Regulating Mill-Stones; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, reference being had to the accompanying drawings, which are made part of this specification, and in which—

Figures 1 and 2 are side elevations of the frame supporting the stones and of the attached devices by which the runner is regulated. Fig. 3 is a central vertical section on the line *x x*, Fig. 1. Fig. 4 is an enlarged view of the nut and screw, the latter rotating to elevate or depress the bridge-piece on which the spindle of the runner is imposed. Fig. 5 is an elevation, and Fig. 6 a top view, of the double-bitted dog and cog-wheel, the former engaging the latter by one or the other of its bits, according to the direction of rotation of the crank-shaft on which the bits are keyed.

Similar letters refer to corresponding parts in the different figures.

The object of my invention is to cause the runner when adjusted to grind at a given weight for the production of a certain amount of flour to maintain its set, notwithstanding the varying expansion of the spindle.

It is manifest that when the spindle is heated it becomes elongated, and when it has a definite and unyielding bearing upon the bridge-piece by the said expansion the runner is lifted and the set is lost.

My improvement is designed to lower the bridge-piece, which supports the spindle on which the runner is poised, so as exactly to make up for the said elongation of the spindle and maintain the stone at the set required, the reverse operation taking place on the cooling of said spindle. The lifting of the runner adds to its weight upon the bridge-piece as it is borne up to a less extent by the grain, and this variation in weight is caused to deflect a scale-beam and move a crank whose shaft, through the medium of a double-bitted dog and connecting-gears, lowers the outer or movable point of suspension of the bridge-piece and restores the runner to its proper relational distance from the bed-stone.

To enable one skilled in the art to which my improvement is allied to construct and use the same I will proceed to describe it.

A is the frame, on which the bed-stone B is planted, and C is the runner, supported by the spindle D upon the bridge-piece E, one of whose ends is hinged at F and the other supported by the screw-rod G, wheel-nut H, and rod I from the sale-beam J, which derives its support from the frame at K. This describes in brief terms the support of the bridge-piece, but from what has already been said it is evident that a means must be provided for moving the point E of the bridge-piece as the spindle D contracts or expands, and this is accomplished by means to be now described.

The required pressure of the runner being graduated by the weight L on the scale-beam J, and the mill being set in operation, should the spindle become elongated the short end of the beam J will be depressed and the other end, *j*, will be raised, rotating the crank M, whose shaft N carries a dog with two bits, O O′. The said motion throws one of the said bits into engagement with cog-wheel P.

At the end of the scale-beam J is a hanger, *m*, having a slot in which the wrist of the crank M works back and forth under the motion of the vibrating arm V, the said oscillating motion not disturbing the hanger, but the elevation of the hanger *m* raising and lowering the wrist.

So much for the means of bringing the bit in contact with the wheel; but now to describe the means by which it moves the said wheel.

On the spindle D is a bevel-gear wheel, Q, which gears into a wheel of similar character, R, on a shaft, S, on which is an eccentric, T, giving a reciprocating motion to a connection-rod, U, and vibrating a frame, V, which has an oscillating motion on a center, W, and carries at its upper end the shaft N and the double-bitted dog O O′ above spoken of. This frame, through the means described, has a constant oscillating motion, and the dog is constantly hovering over the wheel P and so long as the given adjustment is maintained failing to engage with the cogs of the said wheel; but when, from the causes above adverted to, the shaft N is rotated in either direction, then one or the other bit descends, and coming in contact (Fig. 5) with the wheel gives it a partial

rotation, which is continued on the recurrence of the stroke of the frame V until the inciting cause is exhausted by the runner assuming the required proximity to the bed-stone by means of the devices, which I will now describe, which connect the said cog-wheel P with the wheel-nut H, and by rotating it raise or lower the screw-rod G and the bridge-piece E, which is supported thereby.

On the shaft of the cog-wheel P is a bevel-gear wheel, X, which gears into a wheel of similar character, Y, and that by means of the spur-wheel Z on the same shaft rotates the wheel-nut H by engagement with its teeth *h*.

The runner is driven by a band upon a pulley (not shown) on the shaft S.

The operation of the machine has been incidentally described in the current description of the parts, and it is believed to be sufficiently clear. In general terms it is as follows: Supposing the mill to be set in motion, the lengthening of the spindle due to its becoming heated raises the runner farther from the bed-stone and increases its pressure upon the bridge-piece. The increased weight raises the long end of the scale-beam, and by intervention of the hanger partially rotates the crank on which the double-bitted dog is attached, the appropriate bit rotating the cog-wheel which connects with the wheel-nut, and by rotating it causes it to ascend on the screw-rod from which the bridge-piece depends, lowering the latter and with it the runner. An adjustable spring may be substituted for the weighted scale-beam. The cooling of the spindle reverses the motion and the falling of the longer arm of the scale-beam throws the other bit of the dog in connection with the wheel to rotate it in the other direction and raise the bridge-piece.

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

1. The vibrating pawl-frame or its equivalent, operated from the driving power of the mill, in combination with the interposed gearing and adjustable suspension-rod for raising or lowering the bridge-piece.

2. The weighted scale-beam or its equivalent, from which the bridge-piece is suspended and whose oscillations on either side of the given point of adjustment actuate the mechanism for raising and lowering the bridge-piece.

3. In this connection and automatically operated, the rods G and I and wheel-nut H, forming a suspension-rod adjustable as to length for the support of the movable end of the bridge-piece.

JAMES C. ROBERTS.

Witnesses:

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