P. T. ELTING.
Grinding-Mill.

No. 203,126. **Patented April 30, 1878.**

Fig: 1.

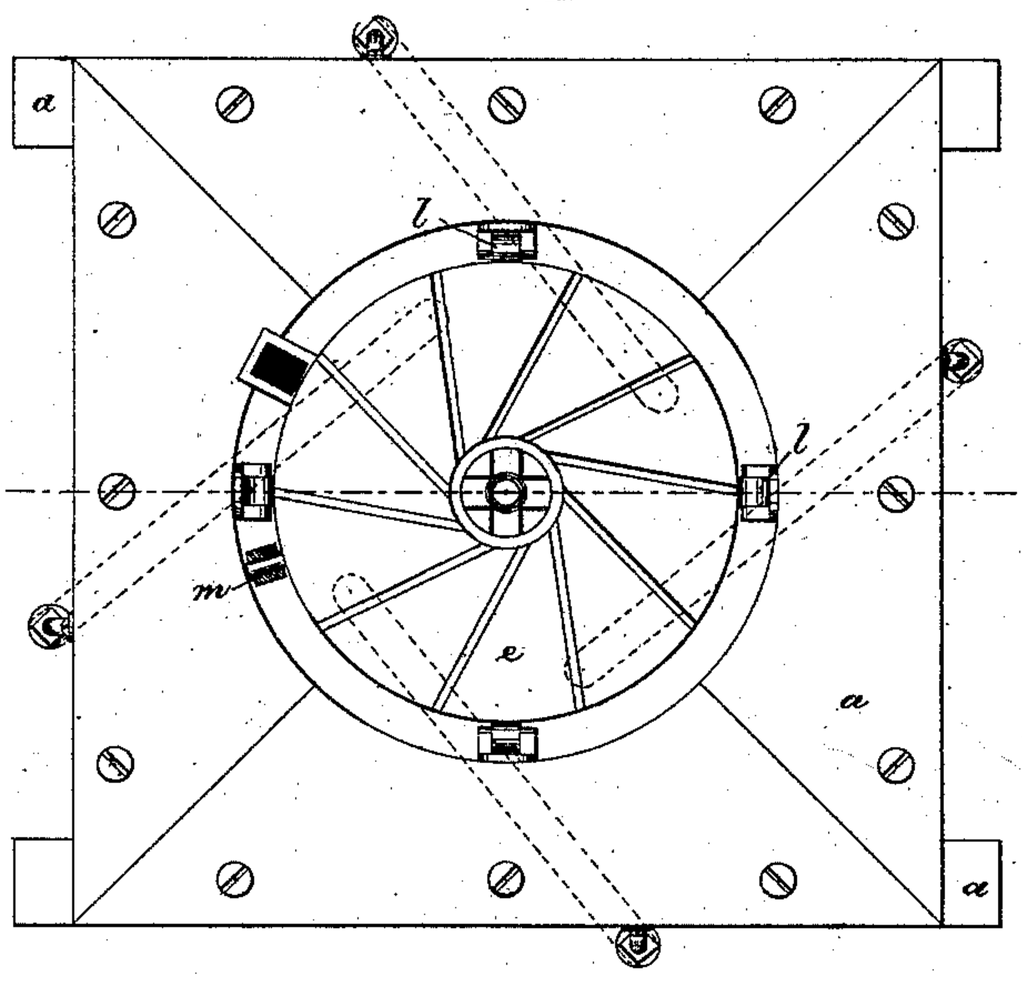


Fig: 3.

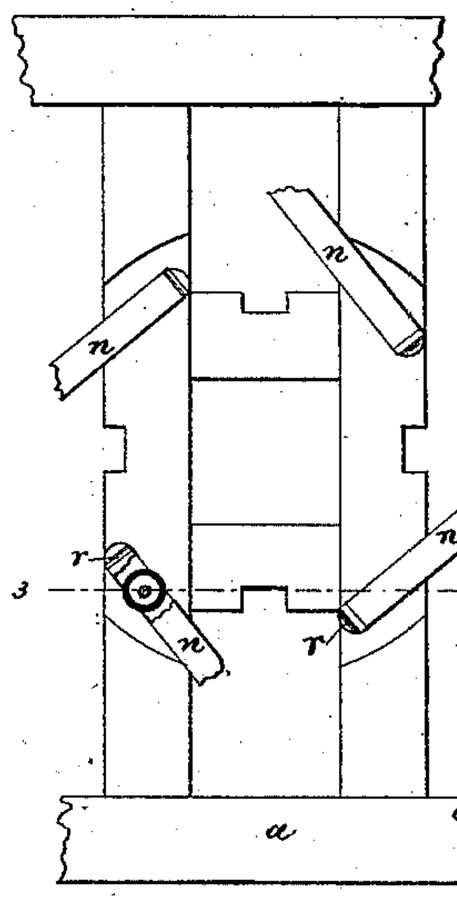


Fig: 2.

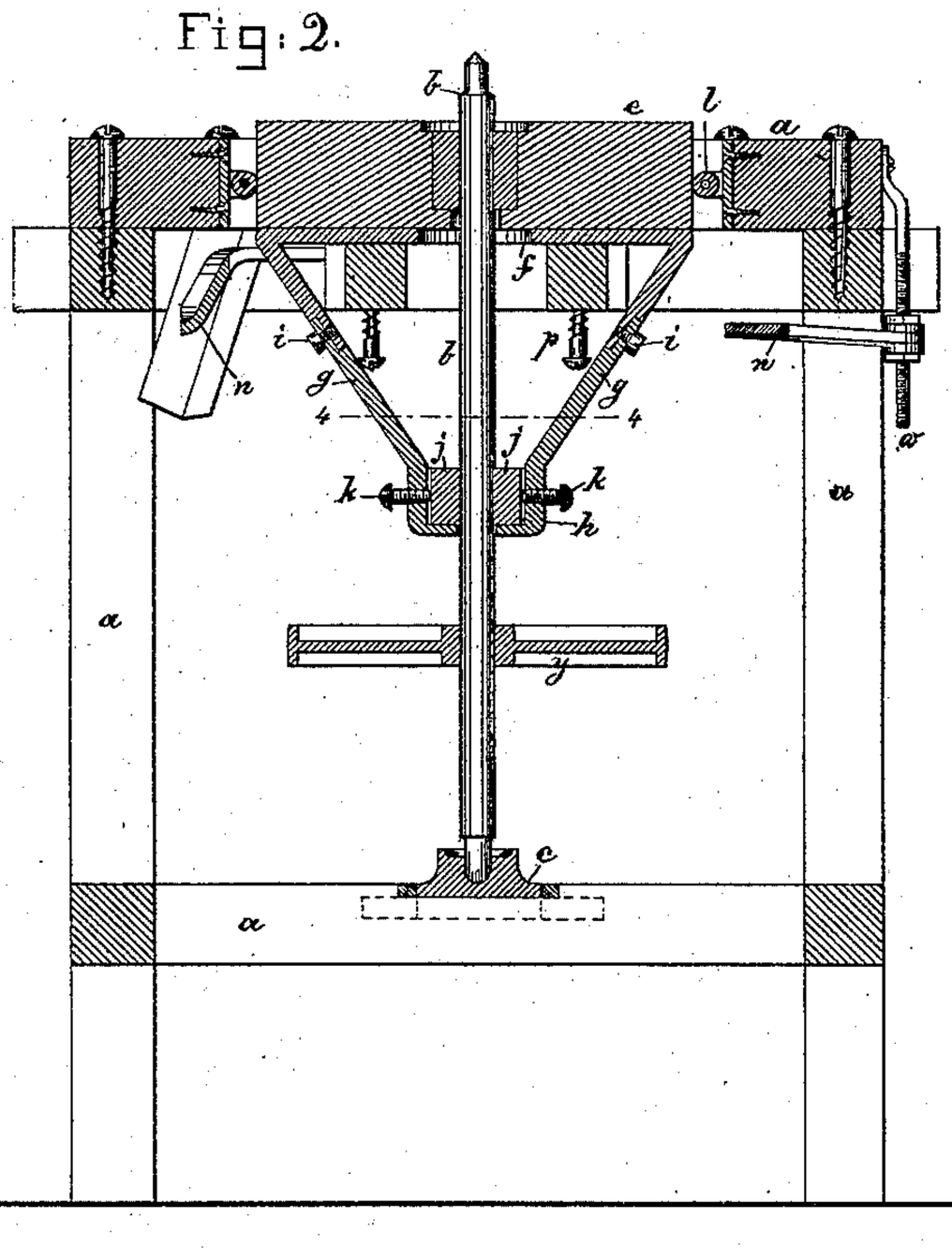


Fig: 4.

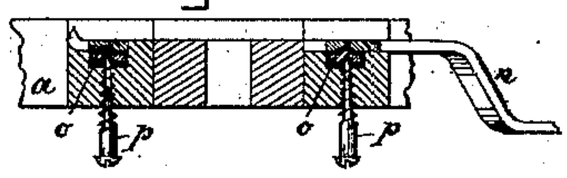


Fig: 5

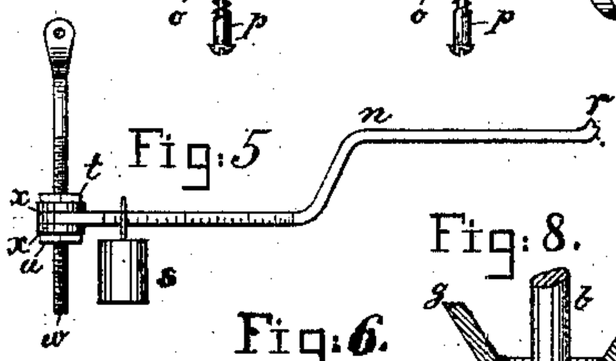


Fig: 8.

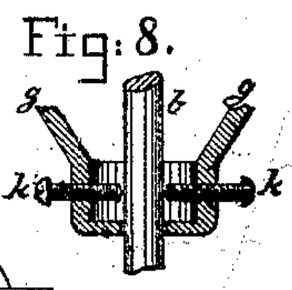


Fig: 6.

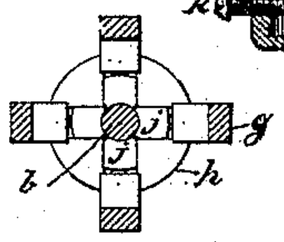
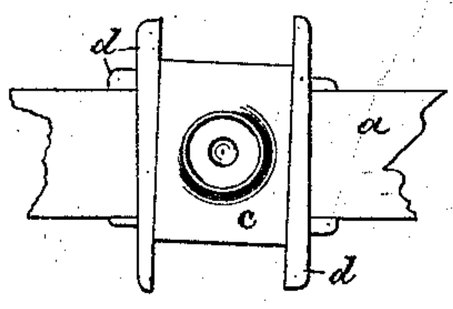


Fig: 7.



Witnesses.

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UNITED STATES PATENT OFFICE.

PETER T. ELTING, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN GRINDING-MILLS.

Specification forming part of Letters Patent No. **203,126,** dated April 30, 1878; application filed September 8, 1877.

To all whom it may concern:

Be it known that I, PETER T. ELTING, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Grinding-Mills, of which the following is a specification:

This invention relates to grinding-mills for grain, and has for its object to maintain the face of the bed-stone at right angles to the axis of the spindle. The runner is mounted upon the spindle in any usual way, and the bed-stone, through which the spindle passes, is stationary.

As now commonly practiced, when the spindle is set to be run, a tram is connected with its upper end to ascertain if the axis of the spindle is at right angles to the face of the bed-stone, and, if not, the foot-step is adjusted or moved in the proper direction to correct the error.

When the mill is being run it frequently happens that the strain upon the spindle causes it to deviate from its true position, so that its axis is not at right angles to the face of the bed-stone, and then the face of the runner and the face of the bed-stone are placed out of truth one with the other, and the stones are worn unevenly, which impairs the grinding action.

Arms or braces, connected or fixed with relation to the bed-stone, are extended from the under side of the bed-stone to a point near the spindle, so that the latter, if deflected or strained, will, through the arms or braces, move the bed-stone in unison with it.

The invention consists, primarily, in supporting the bed-stone at different points of its under surface through the medium of scales, or measures of weight or pressure, to indicate if the action of the running-stone is uniform with relation to all parts of the face of the bed-stone. If the pressure varies, the levers may be adjusted independently to remedy that evil.

Figure 1 is a top view of Fig. 2; and Fig. 2 represents, in vertical section, sufficient of a grinding-mill to illustrate one embodiment of this invention, the section being taken on the line 2 2, Fig. 1. Figs. 3, 4, and 5 represent details of the levers which may be used to determine the position of the face of the bed-stone with relation to the runner. Fig. 6 is a section on the line 4 4, Fig. 2; Fig. 7, a detail of the foot-step of the spindle; and Fig. 8 represents the use of connecting arms and screws as a gage, as will be hereinafter described.

The frame-work *a* of the mill may be of any usual or suitable construction, as may also be the runner (not shown) and the spindle *b* and bed-stone *e*. The spindle *b* rests in the foot-step *c*, made adjustable by wedges *d*, or in any usual manner.

Below the bed-stone, and supported by the frame-work, or otherwise, as hereinafter described, is a rest-plate, *f*, from which project downwardly toward the spindle-body arms or braces *g*, they extending to a collar, *h*, encircling the spindle. These braces may be made in one or more pieces, and of any desired shape. Those shown in the drawings are in two pieces, connected at *i* by a screw.

Within the collar are gibs *j*, in this instance four gibs, they corresponding with the braces; but instead of that number of braces and gibs, three may be used, or more than four. These gibs bear against the surface of the spindle, and are adjustable radially within the collar by means of the adjusting devices *k*, herein shown as screws, such screws being also capable of being used as gages, as hereinafter described.

When the spindle is so adjusted that its axis is at right angles to the face or upper surface of the bed-stone, then the gibs, which were before loose, are adjusted or forced against the body of the spindle by means of the adjusting devices, and are then held so that the spindle may rotate freely between such gibs and within the bed-stone. Now, if the spindle becomes deflected or sprung by reason of the strain of the belt upon it, or for other causes, the bed-stone will be moved in unison with it, and retain its face in the same relation with reference to the axis of the spindle that it occupied when adjusted and the gibs were set up, for the arms or braces then so connect the spindle and bed-stone that the former cannot deviate from its vertical position without also moving the latter.

Anti-friction rollers *l* are arranged to bear against the periphery of the bed-stone, to per-

mit it to move without friction when turned under the strain or action of the spindle, or when adjusting it.

A roller-stud, *m*, arranged at the periphery of the bed-stone, will act as a stop to prevent rotation of the bed-stone, such roller meeting some fixed portion of the frame. The anti-friction stud *m* will reduce friction when the bed-stone is tipped or rocked.

The bed-stone is sustained upon levers *n*—three or more. In this instance of this invention each lever has its fulcrum-point *o* made to permit the lever to rock upon it as the lever of a scale-beam. These fulcrum-points are adjustable by means of screws *p*, so as to place the levers in the same horizontal plane, or adjust them up or down to level the stone. The rear end of each lever has a knife-edged bearing, *r*, to receive upon it the lower side of a metallic plate below the bottom of the bed-stone, in this instance plate *f*. These levers *n* are each provided with suitable lines, notches, &c., as are ordinary scale-beams, and on each lever is placed a movable weight, *s*, so that by moving it the pressure upon or the weight of the bed-stone upon each lever may be ascertained, and one or more of them may be adjusted until all show the same amount of weight or pressure.

During the time this adjustment is being made the nuts *t u* on the screw *w* are turned away from the rubber washers *x*, to permit the levers to rise and fall freely at their outer ends. After such adjustment the nuts *t u* are set up firmly against the rubber washers, and the latter against the ends of the levers, and then, if the bed-stone and spindle move together, the rubber washers will permit the levers to move a little on the screws *w*.

Instead of the weight *s* and the notches of the lever *n*, to weigh the acting pressure upon the bed-stone, the outer end of each lever may be connected with any ordinary form of spring-balance. The whorl of the pulley is designated by the letter *y*.

By means of a support of this kind for the bed-stone, the acting pressure of the runner upon the bed-stone may be used as a means to indicate whether or not the bed-stone is in tram with the spindle.

Increased strain of the belt upon a spindle having braces or connections between it and the bottom of the bed-stone, as described, will not affect the running or adjustment of the grinding-stones, and they will continue to grind evenly and uniformly. The gibs *j* will be provided with suitable means by which they may be lubricated.

It is obvious that the arms *g* may, in connection with the screws *k*, only be used to great advantage as a gage to ascertain whether or not the axis of the spindle is at right angles with reference to the face of the bed-stone when power is applied to the spindle. To do this, the gibs may be removed, and when the spindle is set in tram with the bed-stone the screws may be turned toward the spindle until the point of each occupies a like position with reference to the spindle-surface. After this, power may be applied to the spindle, and if the strain is sufficient to change the position of the spindle out of tram it will be observed that the spindle runs closer to one screw or gage, as it then becomes, than to another, and then the bed-stone may be adjusted by means of the screws *p* until all the gage-screws *k* occupy a like position with reference to the spindles. The wear upon the stone being even, the dressing will last longer.

The term "spindle-surface," as used in this specification, is intended to include any surface revolving in unison and in connection with the spindle, and capable of operating in connection with the arms or gage-screws, as described.

I claim—

The bed-stone, combined with tramming-scales, or measures of weight or pressure, to act upon the under side of the bed-stone at three or more places, and indicate the variation of pressure, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PETER T. ELTING.

Witnesses:
G. W. GREGORY,
W. J. PRATT.