

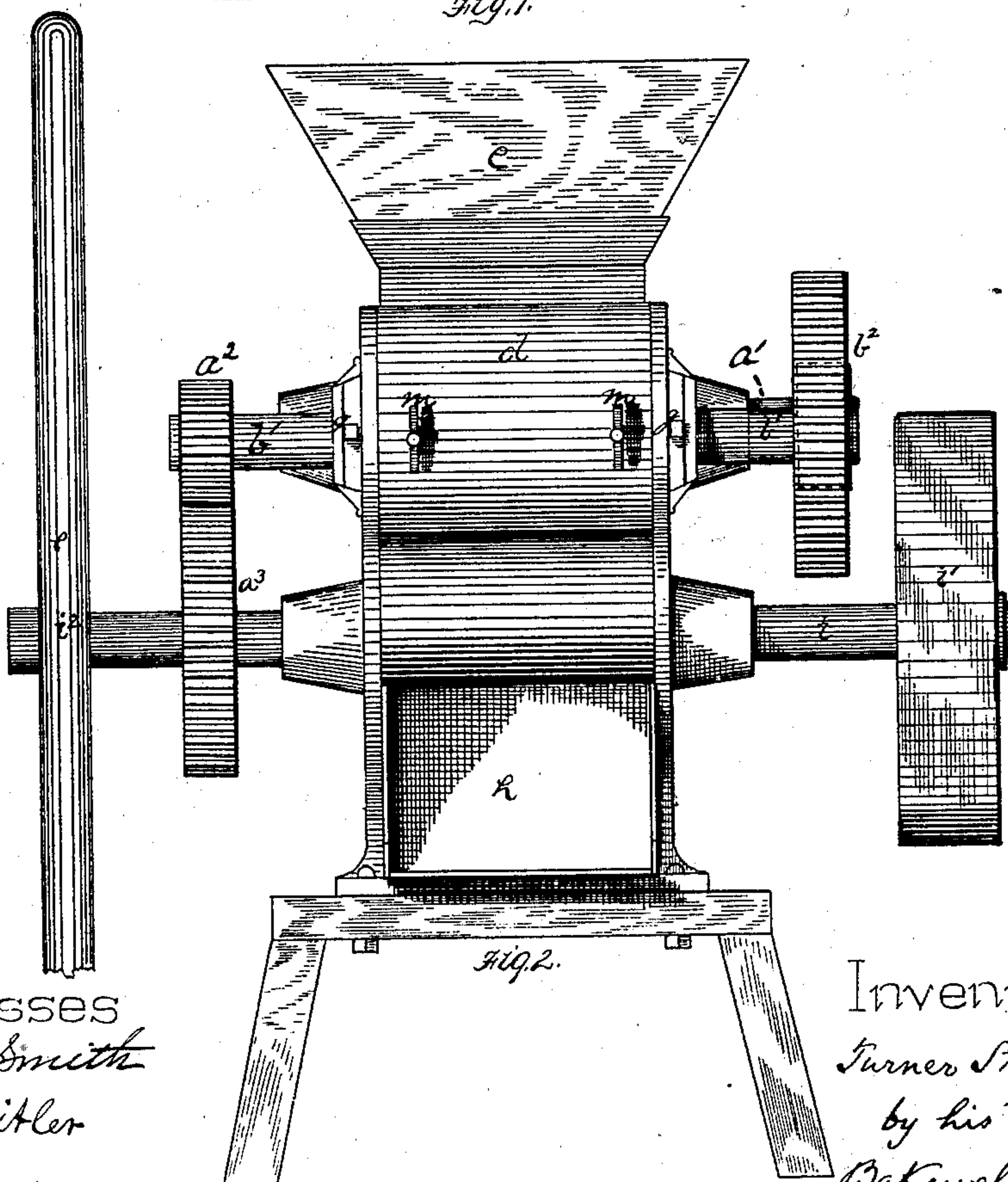
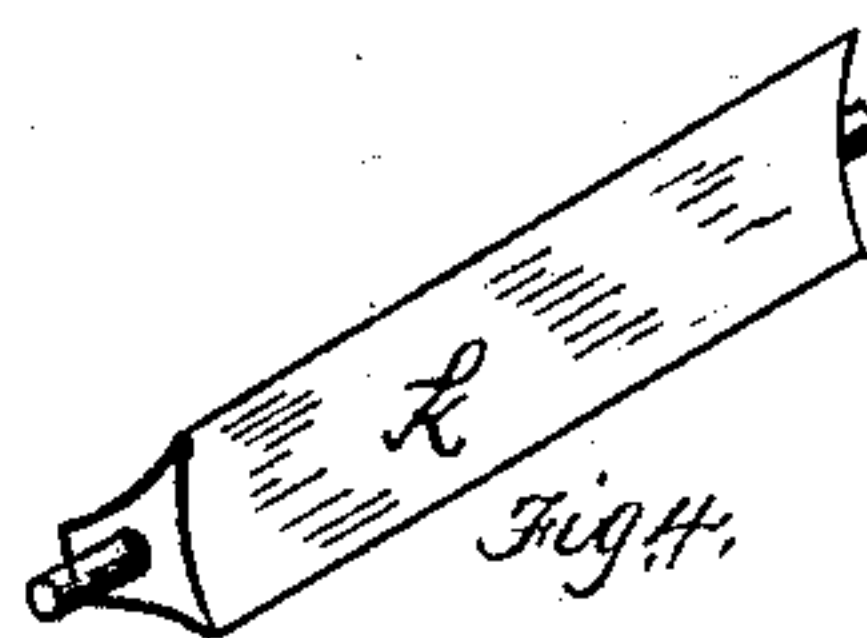
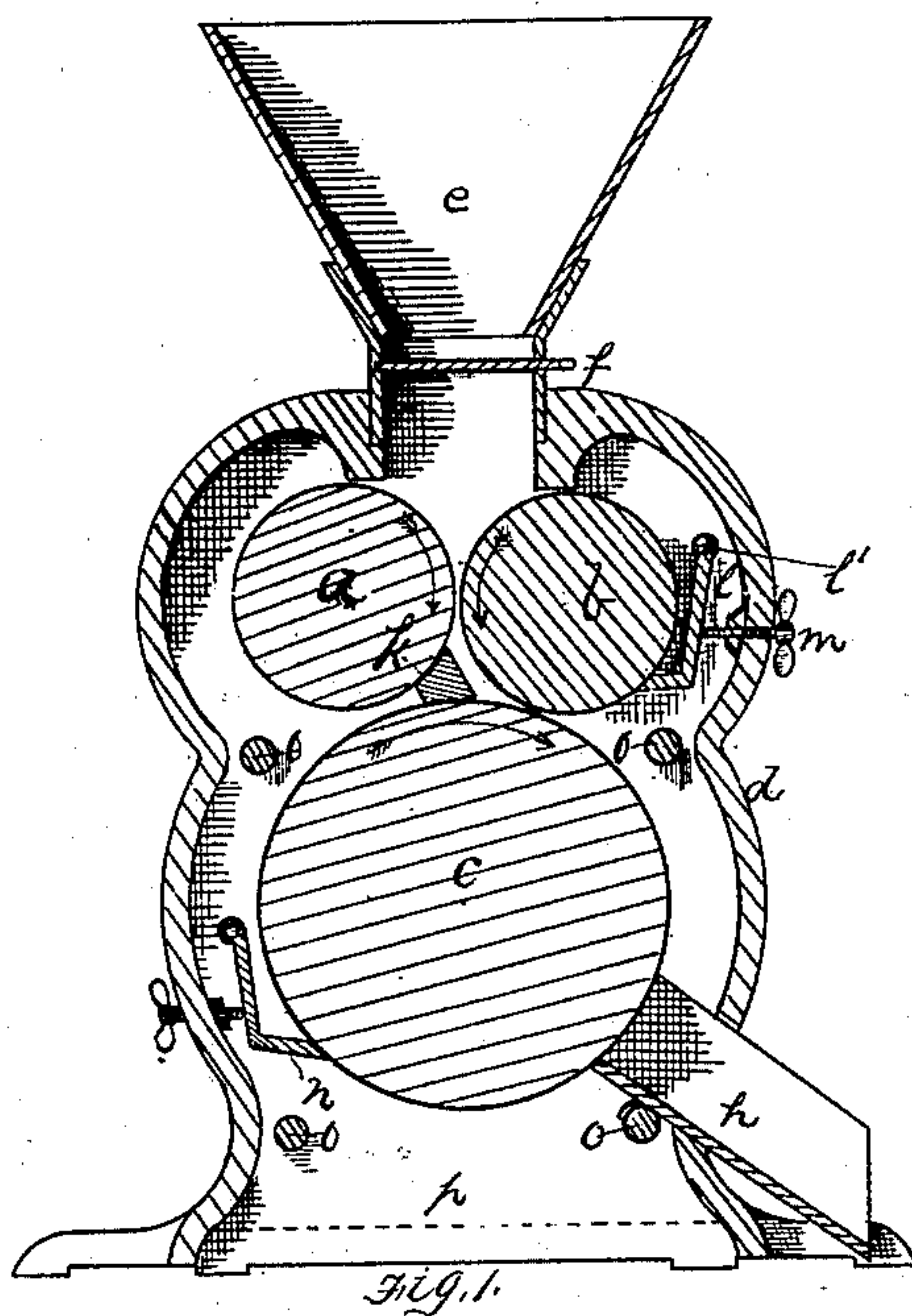
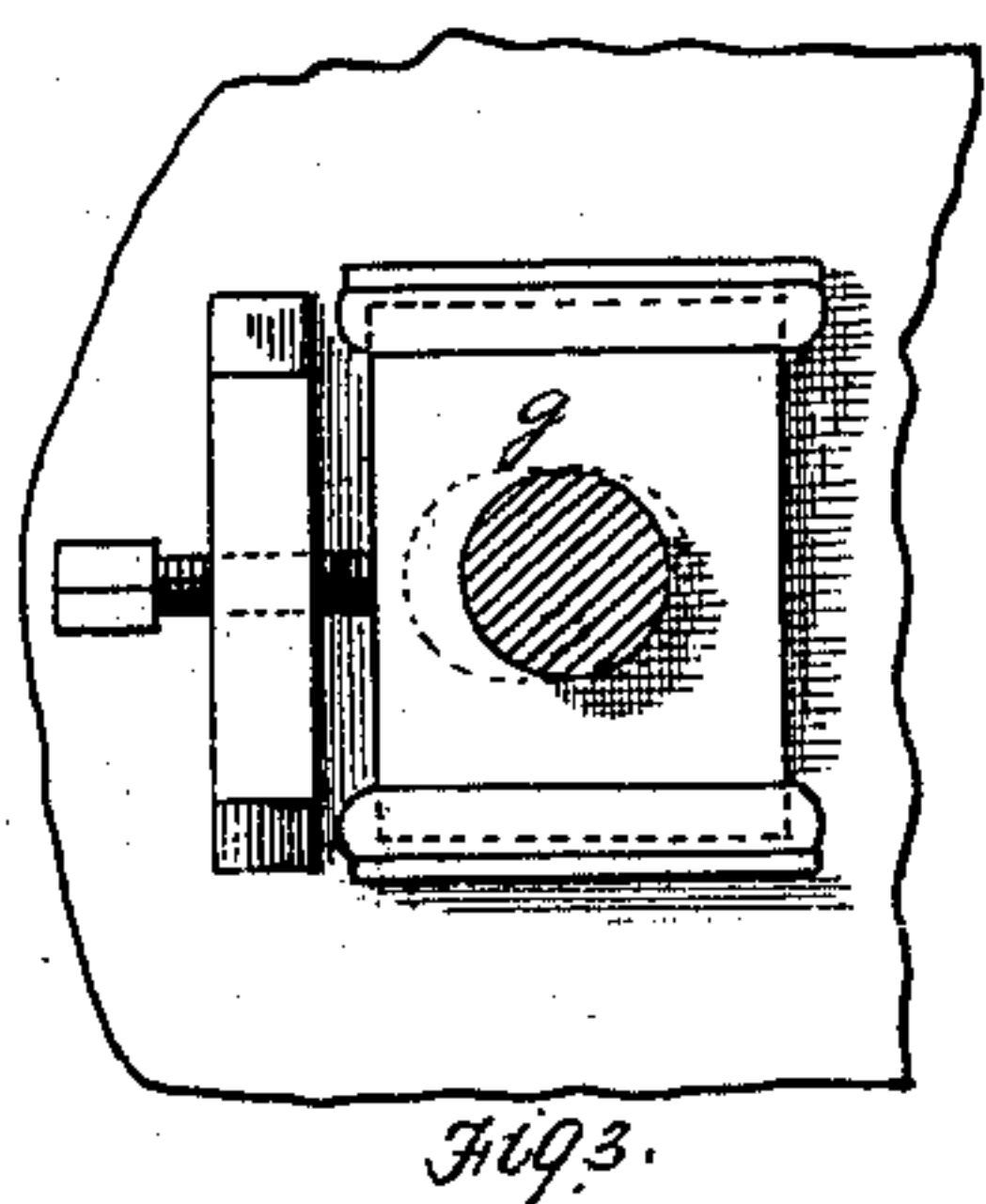
(No Model.)

T. STROBRIDGE.

GRINDING MILL.

No. 264,115.

Patented Sept. 12, 1882.



Witnesses
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UNITED STATES PATENT OFFICE.

TURNER STROBRIDGE, OF NEW BRIGHTON, PENNSYLVANIA.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 264,115, dated September 12, 1882.

Application filed March 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, TURNER STROBRIDGE, of New Brighton, in the county of Beaver and State of Pennsylvania, have invented a new and useful Improvement in Grinding-Mills; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to that class of mills used for grinding feed; but it may be used for grinding various chemicals and other articles, as well as grain.

To enable others skilled in the art to make and use my invention, I will now describe it with reference to the accompanying drawings, in which—

Figure 1 is a vertical cross-section. Fig. 2 is a side elevation. Fig. 3 is a view of the sliding box which is used in connection with one of the rolls, and Fig. 4 is a perspective view of a deflecting-bar.

Like letters of reference indicate like parts in each.

In this machine there are three rolls, *a*, *b*, and *c*. The two rolls *a* *b* are arranged under the hopper of the mill so that the material therefrom is fed directly between them, and the third roll *c*, which is preferably of larger diameter, is arranged directly under the first rolls *a* and *b*, so that a vertical plane drawn through its axis will pass between the rolls *a* *b*. The three rolls give two passes, the first between the rolls *a* *b*, or first and second rolls, and the second between the rolls *b* *c*, or second and third rolls. The axis of the second roll *b* is in a horizontal plane lower than the axis of the first roll *a*, and in such relation to the axis of roll *c* that when the roll *b* is adjusted laterally toward roll *a* to reduce the distance between *a* and *b* it will also approach roll *c* and reduce the distance between *b* and *c* in a relative proportion, so that the adjustment of one roll alters the gage of both passes. These rolls are surrounded by a case, *d*, of suitable form, in the sides of which their axles have their bearings, and at the top of the case, directly over the space between the two rolls *a* *b*, is a hopper, *e*, of any desired form. The passage of the material from the hopper *e* to the grinding-rolls is controlled by a slide, *f*.

The rolls *a* and *c* are journaled in fixed bearings, while the roll *b* is journaled in sliding bearing-boxes *g*. The ground material may be discharged by a chute, *h*, through the side; or it may fall to the floor through the bottom *p*. If the chute is used, a bag or other similar receptacle may be hung on it by hooks thereon. The roll *c* is mounted on the power-shaft *i*, which is provided with a drive-pulley, *i'*, and a fly-wheel, *i''*. The roll *b* is driven by a pinion, *a''*, mounted on the shaft *i*, meshing into a gear-wheel, *a'*, mounted on the shaft *b'*. The roll *a* is driven by a pinion on the shaft *b'*, gearing into a gear-wheel, *b''*, on the shaft *a'*. The rolls turn in the direction indicated by the arrows thereon.

Extending across the machine in the crotch of the fixed rolls *a* and *c* is an angular deflecting-bar, *k*, which causes the material passing between the rolls *a* and *b* to turn to the right and pass down between the rolls *b* and *c* on that side. It is possible to use a fixed combined scraper and deflector between the two rolls *a* *c*, because the axes thereof are fixed and the gage of the passes is altered by adjusting the roll *b* upon which the scraper and deflector does not impinge. It also serves as a scraper to remove all material adhering to the roll *a* from its surface. The rolls are preferably rough on their grinding-faces, *a* being the roughest, *b* less so, and *c* the least. For some kinds of material they may be smooth.

At the right of the roll *b*, opposite or nearly opposite to its axis, is a scraper, *l*, preferably of angle shape, which is pivoted to the ends of the casing *d* by pivots *l'*. The edge of the scraper *l* extends inward toward the roll *b* and is beveled to give it a sufficiently sharp edge. The side of the case *d* opposite the scraper *l* is bored and bushed in one or more places, and the holes thus formed are threaded. Into them are screwed adjusting-screws *m*, bearing against the scraper, by means of which I am enabled to swing the scraper *l* upon its pivots, so as to set it at any desired distance relatively from the surface of the roll *b*. A similar scraper, *n*, similarly mounted and adjusted, is placed for use with the finishing-roll *c*. The scrapers operate to strip off

from the rolls any adhering ground material, so that it may drop down and be further ground or discharged. The case *d* is strengthened by the use of tie-rods *o*, extending longitudinally through it.

In the operation of the machine the roll *b* makes one and one-half revolution to one revolution of the roll *a*, and the roll *c* makes three revolutions to one of the roll *b*. This is accomplished by the difference in size of the gearing which drives the rolls *a* and *b*. The relative speed of the rolls may be changed, if desired. The material is fed in at the hopper *e*, and passes thence down between the rolls *a* and *b*, thence to the right between the rolls *b* and *c* down upon the chute *h*, and thence to the bin or other receptacle, or out at the bottom *p*. The scrapers *k*, *l*, and *n* remove the material which may adhere to the grinding-faces of the rolls and keep them in a condition for their best operation upon the inflowing material.

By my improvement I am enabled to obtain not only a uniform grinding, but keep the rolls always in a good condition, save power, and obtain an increased product. I am able to grind corn which is not thoroughly dry, and other damp substances. The roughened rolls are better for this purpose. For grinding some kinds of chemicals the rolls will do just as well if smooth.

The use of the sliding boxes *g* enables me to set the machine for fine or coarse grinding

at pleasure. The retraction of the roll *b* by means of the boxes *g* gives a wider opening between *b* and *c*, as well as between *a* and *b*, so that one adjustment fixes the gage for the entire mill. If desired, the sliding boxes may be applied to any or all of the rolls.

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

1. In a grinding-mill of the class specified, the combination of three grinding-rolls arranged to give two passes of different gages, two of said rolls having fixed journals, one of said rolls being adjustable to and from the other two, the axes of the rolls being relatively arranged, as specified, whereby the adjustment of the single roll alters the gage of the two passes simultaneously, substantially as and for the purpose specified.

2. In a grinding-mill of the class specified, the combination of three rolls relatively arranged each to the other, substantially as specified, to give two passes, one of said rolls adjustable to and from the other two, and a combined deflector and scraper arranged between the first and third rolls, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 23d day of March, A. D. 1882.

TURNER STROBRIDGE.

Witnesses:

JACOB EMMELL,
JOHN BRIGHT.