L. LANGEVIN.

Motor for Grinding-Mills.

No. 214,159. Patented April 8, 1879.

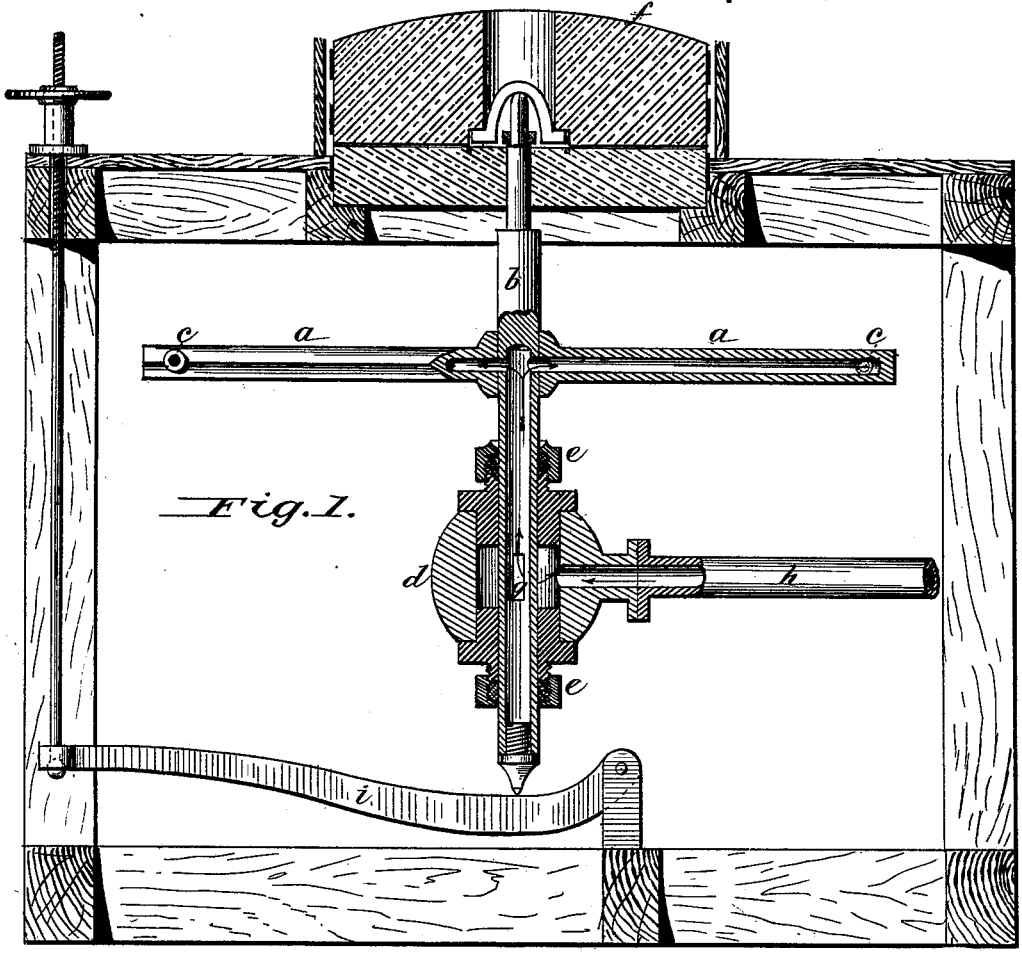

Fig. 1.

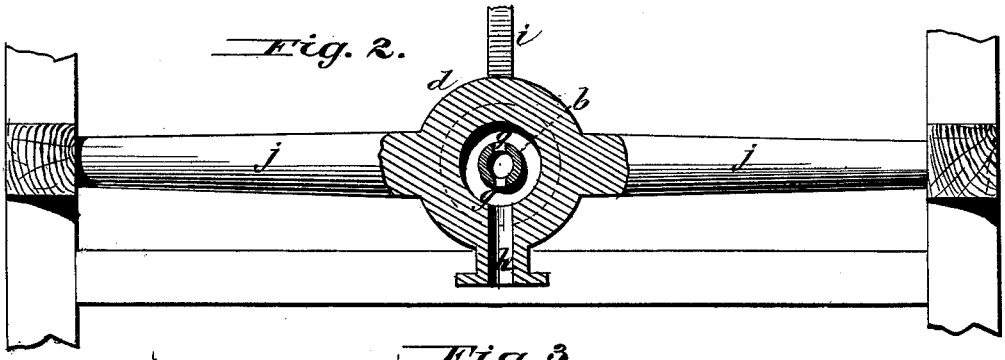

Fig. 2.

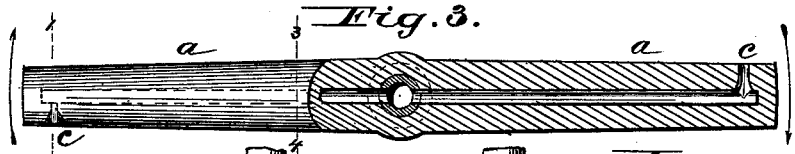

Fig. 3.

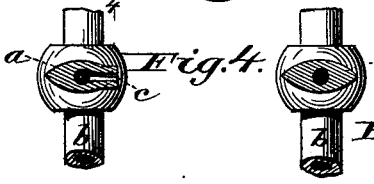

Fig. 4.

Attest:
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UNITED STATES PATENT OFFICE.

LOUIS LANGEVIN, OF BUENOS AYRES, SOUTH AMERICA.

IMPROVEMENT IN MOTORS FOR GRINDING-MILLS.

Specification forming part of Letters Patent No. **214,159**, dated April 8, 1879; application filed January 30, 1879.

To all whom it may concern:

Be it known that I, LOUIS LANGEVIN, a citizen of the United States, but now a resident of Buenos Ayres, South America, have invented certain new and useful Improvements in Motors for Grinding-Mills, of which the following is a specification.

It is well known that in grinding-mills the application of the power by gearing, belts, and cranks gives a varying, irregular, and jarring action to the stones, and necessarily disturbs the positive relation of distance and parallelism of the faces of the stones, which is so unfavorable to the production of the best results. To overcome these objections and apply power to operate a grinding-mill to produce economical and beneficial results, I have improved the Barker mill in its adaptation for driving the runner of a grinding-mill by steam or water, to obtain the desired uniform motion of the running stone. I combine with the spindle of the runner a globe or other shaped closed chamber, through which the spindle passes, and fixed in its relation thereto. This chamber communicates with the supply and with the hollow arms of the spindle by making the latter hollow with cross-openings, which, revolving within said fixed closed chamber, maintain perpetual communication of the hollow arms with the power, whereby said arms, having at their ends and on opposite sides apertures for the escape of steam or water, are caused to revolve with the spindle, and independent of the chamber.

The action of water, steam, or other fluid in the Barker mill is, that whenever a fluid is caused to issue from a vessel through an aperture with a given velocity, there is always impressed upon the inner surface of the vessel opposite to the discharging-aperture a force sufficient to give to the outflowing fluid its instant velocity, no portion of this force being balanced by pressure of the contained fluid upon that part of the inner surface of the vessel, chamber, or tube which has been removed for the outflow of the fluid. A pressure equal to that which would have been impressed upon that part of the inner surface of the vessel removed for the outflow of the fluid is always unceasingly and unvaryingly impressed upon or against the arm of the machine or engine, causing it to move without shock, jar, or tremor in a direction contrary to the movement of the outflowing fluid. In this case, the vessel being the arm or arms of the machine or engine, a rotary motion is produced without jar or tremor, and free from the objectionable features or qualities of rotary motion of millstones produced by every other known means.

The chamber serves to equalize the pressure upon the spindle, and has stuffing-boxes, through which the spindle passes, to allow of the adjustment of the runner, as may be required, to keep the joints tight, and to maintain the spindle in position, because the chamber is fixed to the mill-frame, and has a fixed communication with the supply.

The discharging-apertures of the revolving arms must be sufficiently small in relation to the area of the passages in said arms, and to the hollow of the spindle, to give the greatest possible lateral pressure against the arms at their outlets with a given pressure of the supply. The revolving arms may be arranged to revolve between the millstones and the fixed closed chamber, or between the latter and the adjustable step-lever.

Referring to the drawings, Figure 1 represents a vertical section of a mill embracing my invention; Fig. 2, a horizontal sectional view taken through the fixed chamber; Fig. 3, a partial section of the revolving arms, and Fig. 4 a cross-section through one of the arms at points indicated in Fig. 3.

The hollow arms *a* are fixed directly to the runner-spindle *b*, and have outlets *c c* at or near their ends, opposite to each other, so that the water or steam issuing therefrom and pressing against the solid backs of the arms causes them to revolve.

As a means to make practical the direct application of the Barker mill to the rotation of millstones, I combine therewith a chamber, *d*, of globe or other form, fixed in its relation to the spindle, and through which the latter passes, and is adapted to work therein with close joints by stuffing-boxes *e e* at the opposite sides of said chamber, so that the spindle and its runner *f* can be adjusted as may be desired. This chamber serves as the means of making a perpetual communication of the revolving arms with the supply through the spin-

dle, which is made hollow, and has cross openings *g* within said chamber, so that the steam or water entering said fixed chamber passes therefrom through the cross-openings *g* into the arms, from which it escapes, and drives them and the spindle by unbalanced pressure within the arms. As the chamber surrounds the cross-openings in the spindle, the pressure on the latter will be equalized from the pipe *h*, which leads from the side of said chamber to the boiler or head of water. This construction renders the rotation and adjustment of the spindle and its running millstone independent of the medium through which the revolving arms have communication with the power, and makes said chamber and its stuffing-boxes centering-guides for the mill-spindle.

The fixed chamber in which the spindle revolves is of sufficient area to give ample supply for the space in the spindle and for the communicating spaces of the revolving arms to exert the proper force thereon at the exit-apertures, which must be of a size adapted to such force.

The revolving arms may be arranged upon the mill-spindle, either between the fixed chamber and the runner-stone, as shown, or between said chamber and the step-lever *i*, or other adjusting device which may be used.

My object is to obtain the advantage of the steady motion of the Barker mill, or any engine or device equivalent thereto, as producing like results in respect to steadiness of motion, and incidentally the advantages in the greater portability and less cost of the several parts of machinery necessary to the reducing of wheat to flour, in connection with the best means of making such devices available for producing the desired results.

The driving-spindle may be used in a horizontal position, if desired, the plane of motion of the millstone being vertical. The chamber through which the spindle passes is supported by a cross-arm, *j*, in the frame-work, through which steam or water may be introduced to the fixed chamber, instead of by the side opening shown in the drawings.

I prefer to make the revolving arms of double convex form in cross-section, as shown in Fig. 4, for the purpose of offering the least resistance to the air in revolving, as the meeting of the convex sides forms feather-edges.

I claim—

1. The combination, with the revolving spindle and its arms connecting therewith, substantially as herein set forth, of a chamber fixed in its relation to the spindle and its arms, and adapted to have a perpetual communication with said spindle-arms and the source of supply of the power, whereby to effect a uniform, constant, and unvarying relation of the motion of the arms or rotary engine to the motion of the spindle and to the runner.

2. The fixed chamber *d*, provided with stuffing-boxes *e e* for the spindle, and the latter provided with lateral openings *g g*, communicating with said chamber and the induction-pipe *h*, in combination with the hollow spindle *b* and its hollow arms *a*, having opposite side outlets, *e e*, arranged for operation substantially as herein set forth.

3. A grinding-mill consisting of the fixed and runner stones, a hollow spindle, *b*, communicating with the hollow arms *a* thereof, a chamber, *d*, through which the spindle passes, communicating with said hollow spindle, its hollow arms, and the source of supply of the power, and having a fixed relation to said spindle, and adapted for operation substantially as herein set forth.

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

LOUIS LANGEVIN.

Witnesses:

FRANCIS TAGGART,

E. E. LOMBARD.