No. 655,293. Patented Aug. 7, 1900.

A. M. ZIMMERMAN.

MILL FRAME.

(Application filed Oct. 5, 1897.)

(No Model.) 4 Sheets—Sheet 1.

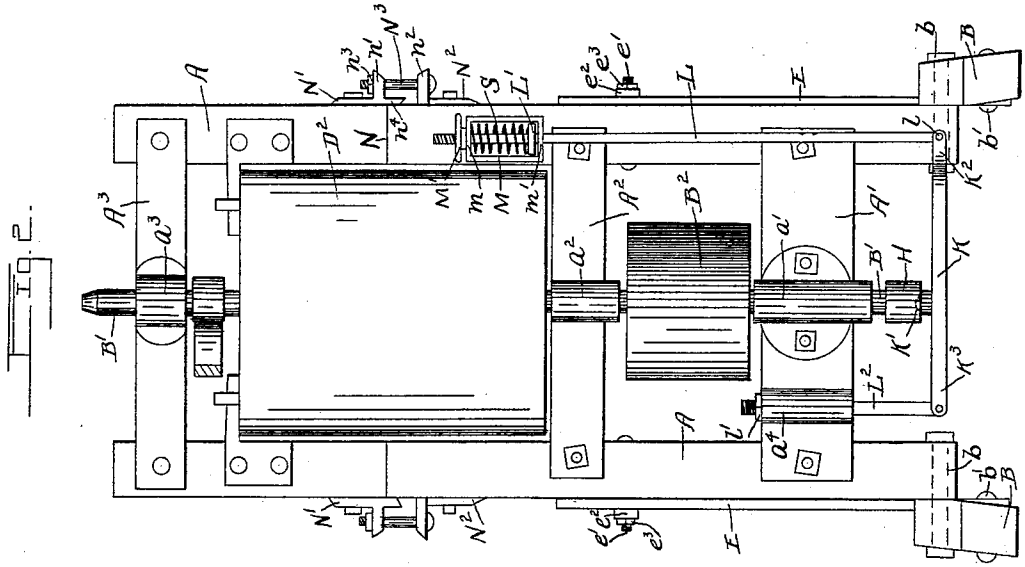

Fig. 2.

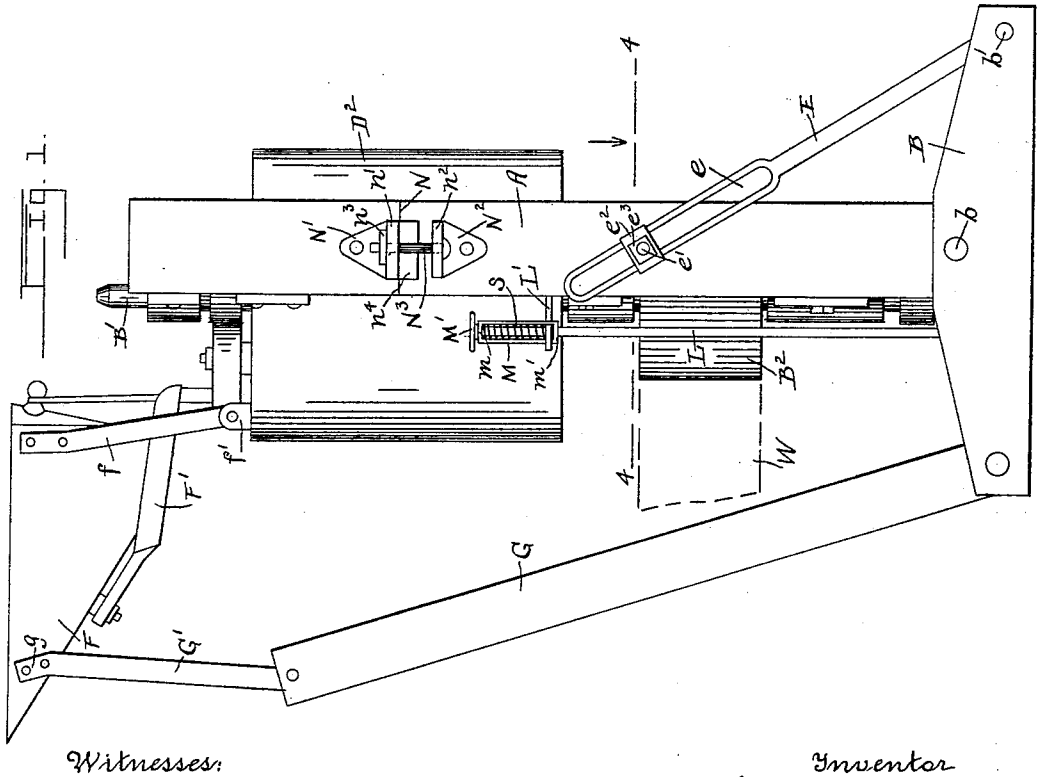

Fig. 1.

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4 Sheets—Sheet 2.

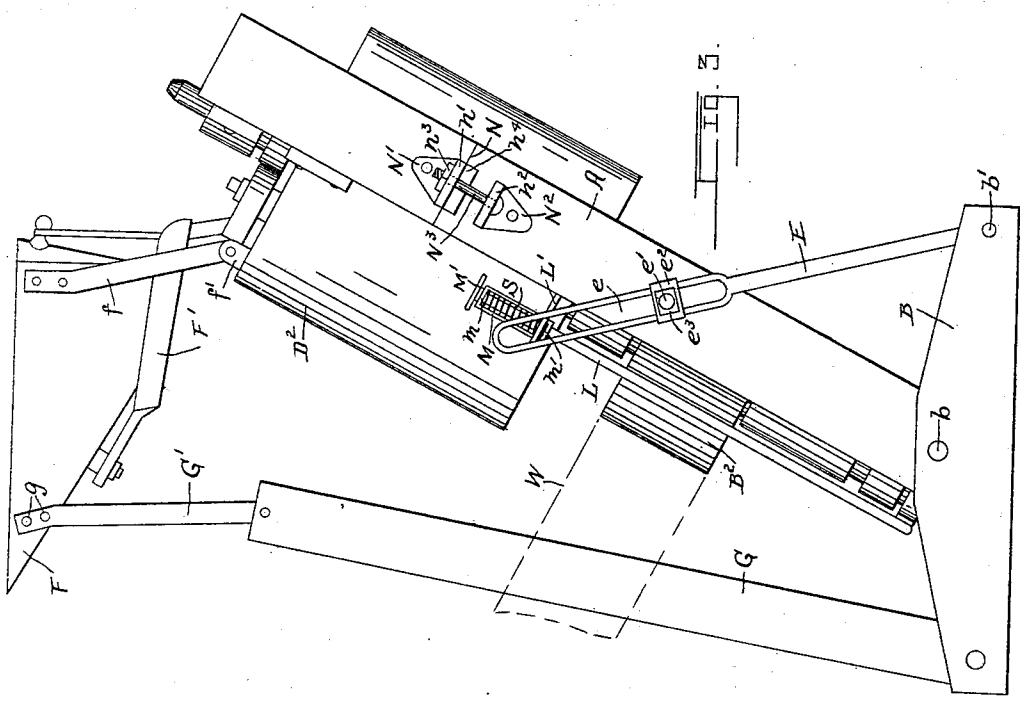


Fig. 4.

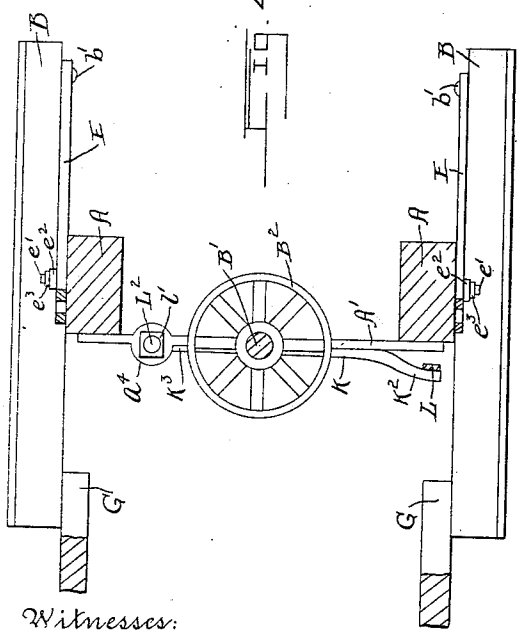
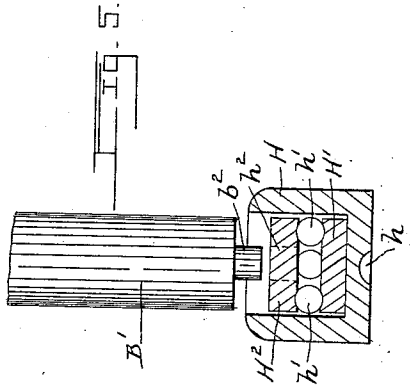


Fig. 5.



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(Application filed Oct. 5, 1897.)

(No Model.) 4 Sheets—Sheet 3.

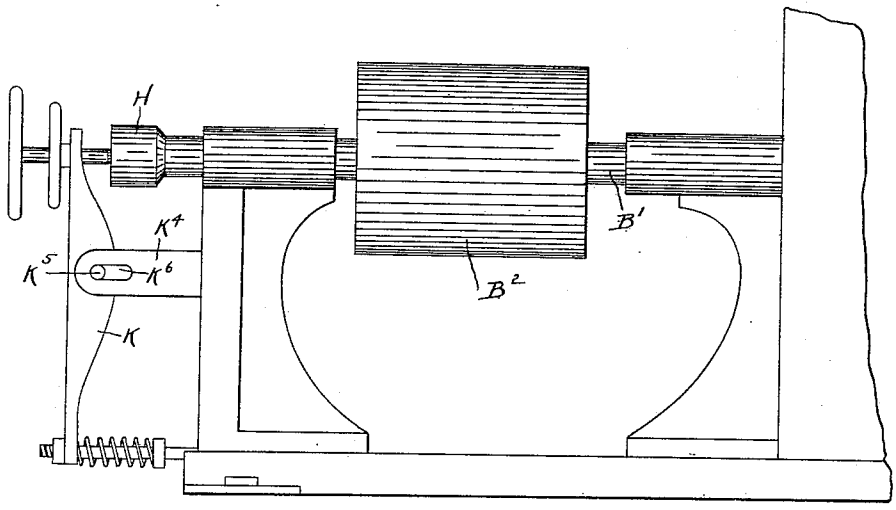

FIG. 7.

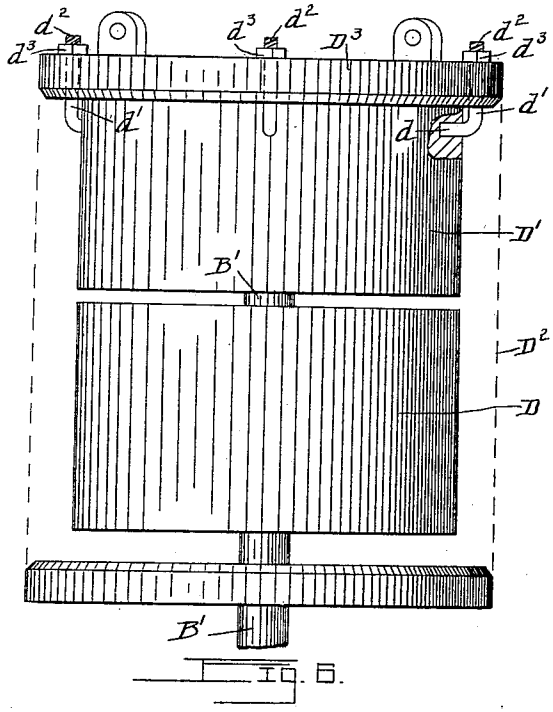

FIG. 8.

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MILL FRAME.

(Application filed Oct. 5, 1897.)

(No Model.) 4 Sheets—Sheet 4.

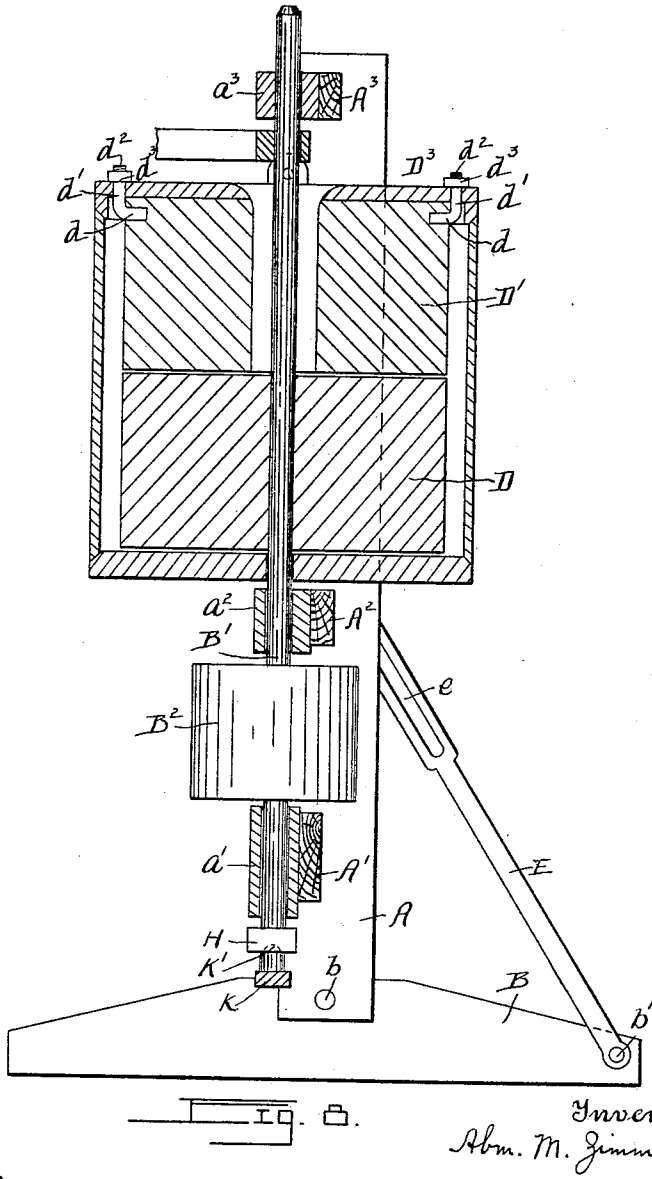

Fig. 1.

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UNITED STATES PATENT OFFICE.

ABRAHAM M. ZIMMERMAN, OF NEW HOLLAND, PENNSYLVANIA.

MILL-FRAME.

SPECIFICATION forming part of Letters Patent No. 655,293, dated August 7, 1900.

Application filed October 5, 1897. Serial No. 654,109. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM M. ZIMMERMAN, a citizen of the United States, residing at New Holland, in the county of Lancaster and State of Pennsylvania, have invented certain Improvements in Mill-Frames, of which the following is a specification.

This invention relates to improvements in that class of grist-mills known as "portable mills;" and the objects of my improvements are, first, to so construct the mill-frame that the same may be adjusted to locate a pulley on the shaft of the running stone, so that an axial plane of a horizontal shaft located above or below said pulley and from which motion is to be communicated to that pulley may pass transversely through said pulley; second, to secure the stationary stone to its head more securely than is done at present; third, to improve the bearing for the shaft or spindle carrying the running stone, and, fourth, to adjust the position of the running stone with reference to the stationary stone.

The invention consists in the construction and combination of the various parts, as hereinafter fully described and then pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a side elevation of a mill embodying my invention, the parts being shown in their normal positions; Fig. 2, a front elevation; Fig. 3, a side elevation showing the mill tilted from the perpendicular; Fig. 4, a section on broken line 4 4 of Fig. 1; Fig. 5, an enlarged vertical section of the bearing supporting the shaft of the running stone; Fig. 6, an elevation of the millstones detached from the frame, parts being cut away to show the manner of securing the stationary stone to the head; Fig. 7, a side elevation of a portion of the frame of a vertical mill, showing the application thereto of my improved bearing for the shaft of the running stone; and Fig. 8 is an axial vertical section in a plane at right angles to that of Fig. 2, showing the stationary stone and the running stone within the casing, the hopper being detached.

Similar letters indicate like parts throughout the several views.

Referring to the details of the drawings, A indicates the two posts of the frame, located on opposite sides of the mill.

B indicates the two sills, to each of which is pivoted one of the posts A, and *b* indicates the pins pivoting the posts to the sills.

A′, A^2, and A^3 are respectively the bottom, intermediate, and top cross-beams of the frame.

B′ indicates an upright shaft passing through bearings *a*′, a^2, and a^3 of cross-beams A′, A^2, and A^3, respectively, and to which the running stone D, Fig. 6, is rigidly secured, and B^2 is the pulley on shaft B′ and through which motion is communicated by a belt. (Shown by broken lines W, Figs. 1 and 3.)

E indicates diagonal braces for the posts A, which braces have their lower extremities pivoted to corresponding ends of sills B by pins *b*′. The upper ends of braces E have longitudinal slots *e* formed therein, and these slots engage threaded pins *e*′ in the sides of the posts. On pins *e*′ are washers e^2, that lap the sides of the slots *e*, the washers being secured on the pins by nuts e^3, whereby the braces are clamped in an adjusted position against the sides of posts A.

F indicates the hopper, and F′ the shoe, whereby grain is fed to the mill. The delivery end of the hopper is supported by arms *f*, rigidly secured thereto, the lower ends of said arms being pivotally connected with lugs *f*′ on the case D^2, surrounding the millstones. On the ends of sills B, opposite those to which braces E are attached, are pivoted rocking posts G, on the upper ends of which are pivoted links G′, having their upper ends rigidly secured to the outer extremity of hopper F, as shown at *g*, Figs. 1 and 3. The other details of the construction for feeding grain to the mill are not described, as they do not form any part of my invention.

It is frequently inconvenient and sometimes impossible to locate a portable mill in such position that the pulley on the shaft carrying the running stone can be placed in such position that an axial plane of a horizontal shaft from which motion is communicated to said pulley will pass transversely through that pulley, which is necessary in order to

transmit motion directly from the horizontal shaft to the pulley. In my invention, therefore, the posts of the mill-frame and those of the hopper are hinged to their supports, as shown and described, in such manner that the mill-frame may be adjusted to such an angle that an axial plane through a horizontal shaft from which motion is communicated to the pulley on the shaft of the running stone and which horizontal shaft is located above or below the pulley will pass transversely through said pulley. The angular adjustment is made by loosening the nuts e^3, so as to allow pins e' to slide freely through slots e and then turning posts A about their pivots until they reach the position they are desired to occupy, when the nuts e^3 are again tightened up. The diagonal braces E conform to the movement of the posts by reason of their being pivoted to sills B, as shown at b', and the hopper also conforms to the movement of said posts because of the hinged connections of its support, and said hopper is at all times maintained in an approximately-horizontal position.

D′ indicates the stationary stone. (See Fig. 6.) This stone is generally secured to its head or cap D^3 by cement or plaster-of-paris; but the jarring of the mill is apt to sever the connection thus made between the parts, especially when the stone is a heavy one. In my improvement I connect the parts by angle-bolts. The horizontal part d of the bolt is inserted in an opening in the stone, and the vertical part d' of the bolt passes up through an opening in the cap D^3, said vertical part of the bolt having its upper end d^2 threaded, and this threaded end is engaged by a nut d^3. There may be three, four, or more of these angular bolts, so that the counter-pressure thereof holds their horizontal parts in engagement with the stone, and the nuts d^3 serve to adjust the stone in the cap. If preferable, the parts d of the bolts may be secured in the openings in the stone by cement or wedges; but this is not necessary.

The bearing or step for the foot b^2, Fig. 5, of the shaft B′ comprises a cylindrical box H, having a semicircular recess h in the under side of the bottom thereof and which takes over a semicircular stud K′, Fig. 2, on a lever K, to be described. Resting on the bottom of box H is an annular plate H′, Fig. 5, having a circular groove therein, in which play a number of antifriction-rollers h', and resting on these antifriction-rollers is a plate H^2, similar to plate H′, but which has a circular groove in its lower face that takes over antifriction-rollers h'. The foot b^2 of the spindle is cylindrical in cross-section and engages a similarly-shaped opening h^2 in plate H^2. This construction affords a bearing for the spindle that permits all of the parts to revolve upon their supports.

The lever K, carrying shaft B′, has one end K^2 pivoted at l to a yielding rod L, which extends upward and passes loosely through an opening in an arm L′, projecting from one of the posts, and through the top and bottom plates m and m', respectively, of a frame M, the top plate m whereof serves as a bearing for a spring S, coiled around rod L, between said plate m and the arm L′, the lower end of spring S bearing on arm L′. The upper end of rod L is threaded, and this threaded end is engaged by a hand-nut M′, which bears upon the top of plate m. The other end K^3 of lever K is supported by a rod L^2, that passes up through a boss a^4 on cross-beam A′ and has its upper end threaded and engaged by a nut l', which bears upon boss a^4 and supports rod L^2. The position of the runner with reference to the stationary stone is regulated by nuts M′ and l', and should any foreign matter of unusual size get between the stones the spring S enables the runner to yield automatically.

The frame is divided horizontally into sections, as shown at N, Figs. 1, 2, and 3, that the upper or both millstones may be removed for dressing or for other purposes. Above the division-line N and on the outer face of the upper sections of the posts are brackets N′, and on the lower sections of the posts, below brackets N′, are brackets N^2. Through openings in ears n' and n^2 of brackets N′ and N^2, respectively, are passed bolts N^3, secured in place by nuts n^3, whereby the two sections of the mill are detachably secured together. On the lower ends of the vertical plates of brackets N′ are downwardly-extending lips n^4, which when the sections of the posts are joined together lap the tops of the lower sections thereof to prevent lateral movement of the upper sections.

In Fig. 7 is illustrated the application of the bearing of the shaft of the running stone and the lever supporting the same to a mill in which the stones operate vertically. In this construction the box H is so set that the plates H′ and H^2 occupy a vertical position. The lever K is fulcrumed in the center to an arm K^4, the fulcrum K^5 engaging a slot K^6 in arm K^4.

I do not restrict myself to the details of construction herein shown and described, as it is obvious that many alterations may be made therein without departing from the spirit and scope of my invention.

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

1. The combination, in a mill of the character described, of a base, a support for the mill hinged to the base, means for securing said support in an adjusted position, arms secured to the delivery end of the hopper and hinged to the mill-casing, and a support for

the rear of the hopper having a pivot connection with the base, for the purpose specified.

2. The combination, in a mill of the character described, of a base, a support for the mill hinged to the base, means for securing said support in an adjusted position, arms secured to the delivery end of the hopper and hinged to the mill-casing, posts pivoted to the base, and links pivoted to the upper ends of said posts and secured to the rear end of the hopper, substantially as and for the purpose specified.

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