

No. 689,034.

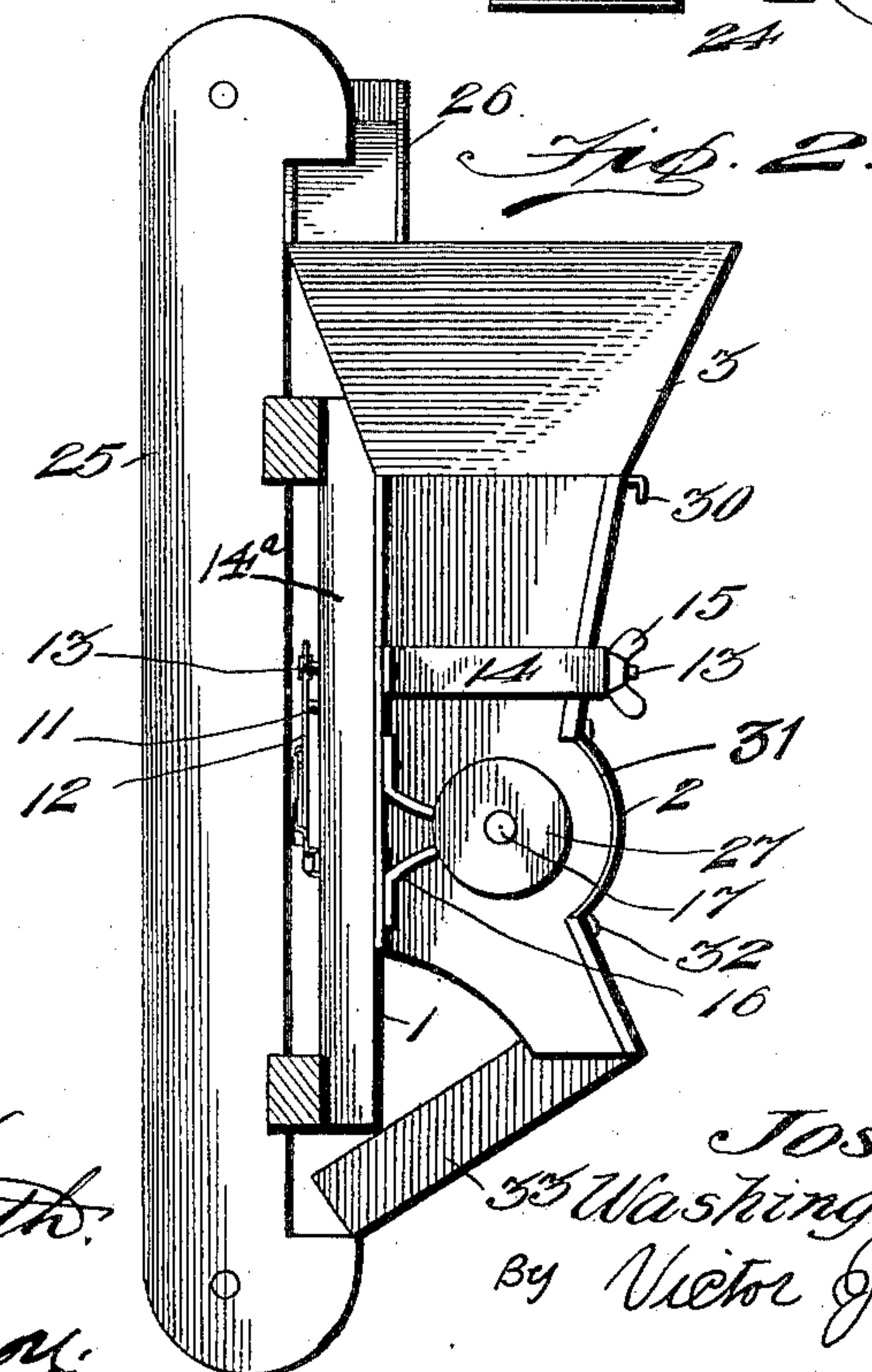
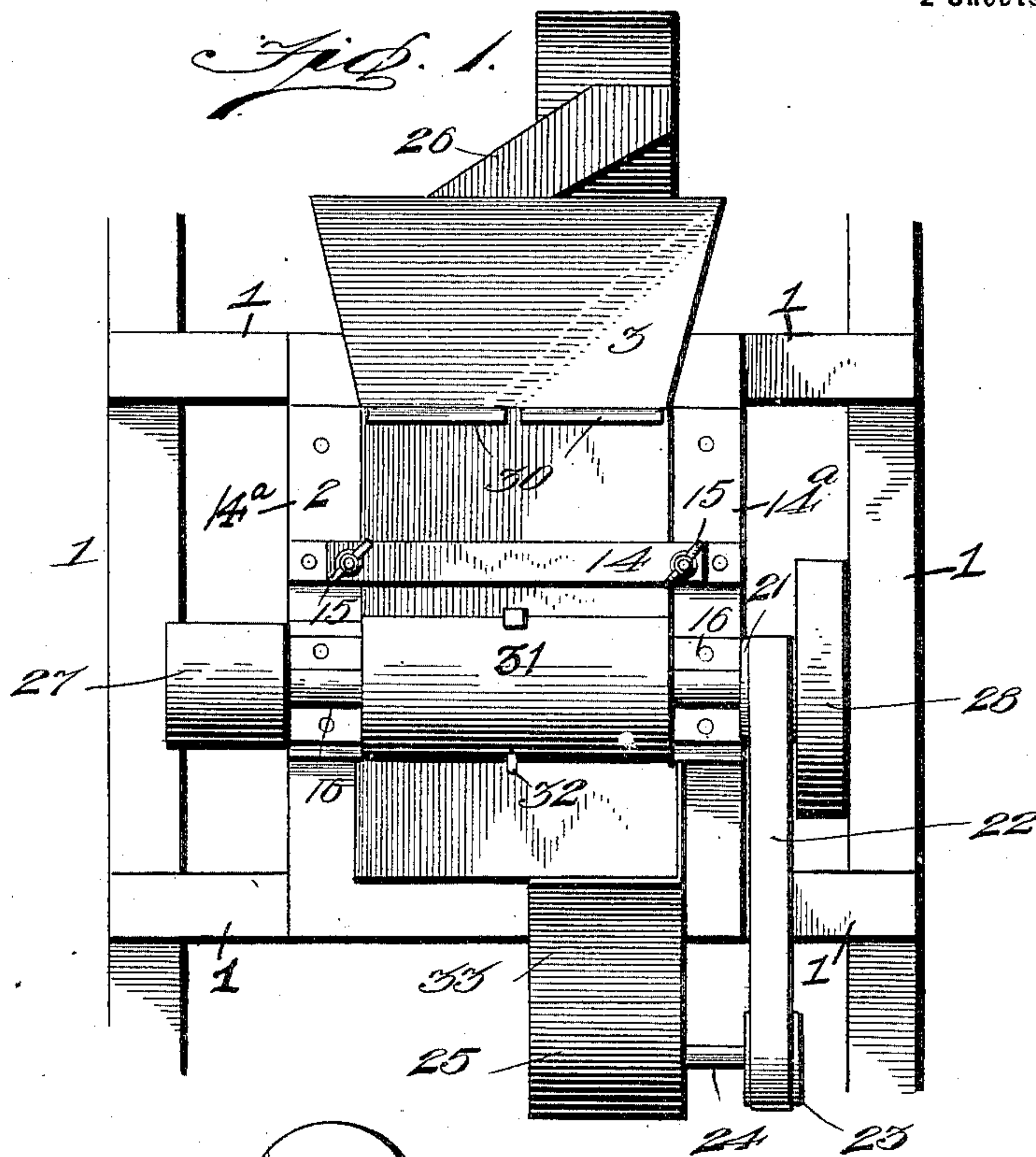
Patented Dec. 17, 1901.

J. BERCHA & W. I. CHAPMAN.  
GRINDING MILL.

(Application filed Mar. 22, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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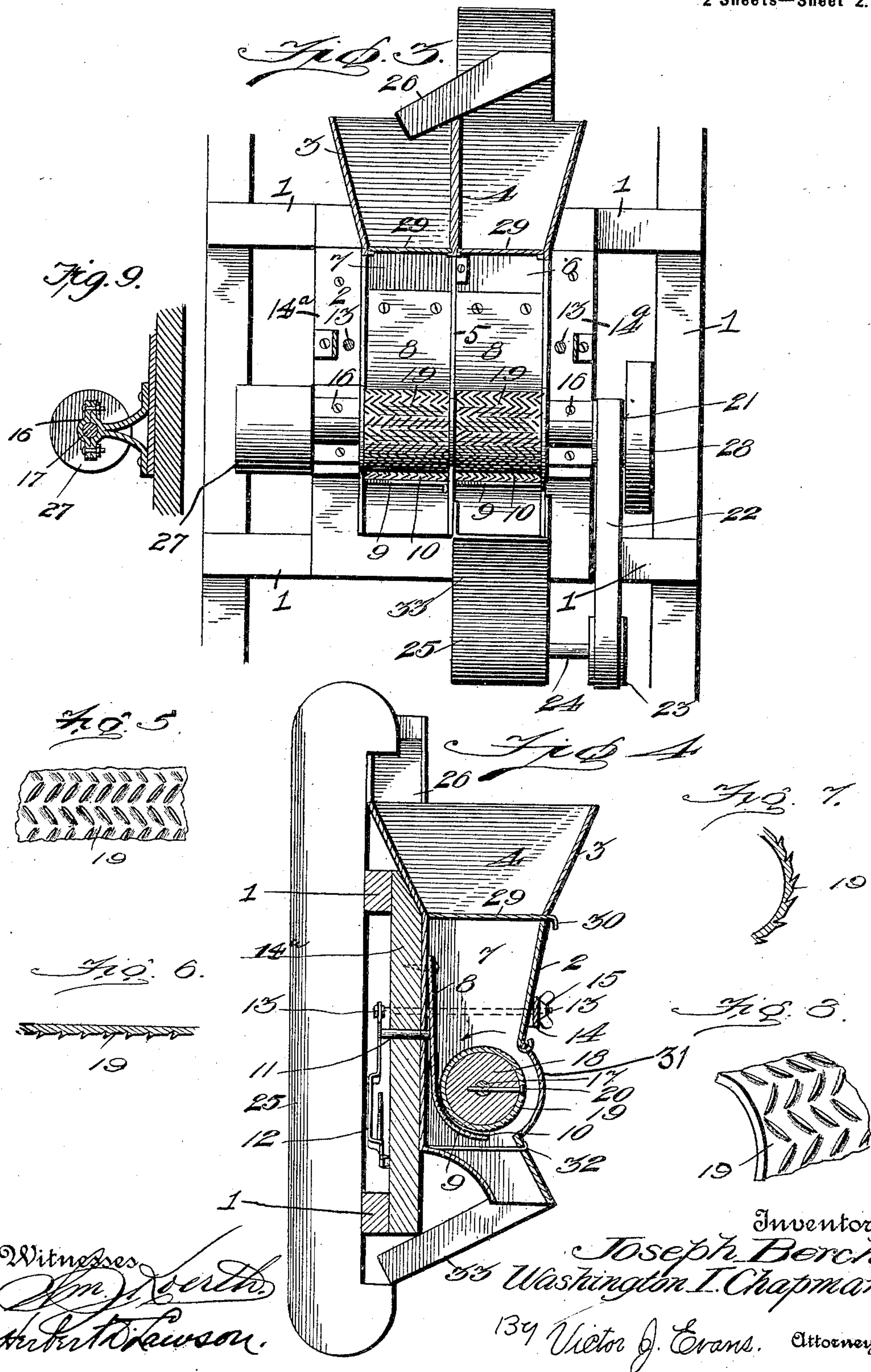
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# UNITED STATES PATENT OFFICE.

JOSEPH BERCHA AND WASHINGTON I. CHAPMAN, OF ATKINSON,  
NEBRASKA.

## GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 689,034, dated December 17, 1901.

Application filed March 22, 1900. Serial No. 9,749. (No model.)

*To all whom it may concern:*

Be it known that we, JOSEPH BERCHA and WASHINGTON I. CHAPMAN, citizens of the United States, residing at Atkinson, in the  
5 county of Holt and State of Nebraska, have invented new and useful Improvements in Grinding-Mills, of which the following is a specification.

This invention relates to new and useful  
10 improvements in machines for grinding grain; and its primary object is to provide a device of this character which is simple in construction and effective in use, which is adapted to produce a coarse or fine product, and having  
15 grinding-rollers of such construction whereby clogging and heating of the grain during the process of grinding are prevented.

To these ends the invention consists in providing a device having two vertical compartments separated by a removable partition,  
20 each containing a roller, to which is detachably secured a cylindrical case or jacket, the grinding-surfaces or dress of which are arranged in a certain manner, as will be hereinafter more fully described. A long pendent  
25 plate curved at its lower end to provide a concave and having a similar grinding-surface arranged thereon is mounted within each of the compartments adjacent to and  
30 partly inclosing the grinding-rollers, and these plates or concaves are adjustable independently of each other in a simple and effective manner. A conveyer extends upward from the bottom of one compartment and is adapted  
35 to discharge the contents thereof into the upper portion of the adjacent compartment, where the contents are reground and then discharged.

The invention also consists in providing a  
40 casing of peculiar construction, whereby the grinding-surfaces may be readily inspected.

The invention also consists in the further novel construction and combinations of parts hereinafter more fully described and claimed,  
45 and illustrated in the accompanying drawings, showing the invention, and in which—

Figure 1 is a front elevation of our improved grinding-mill. Fig. 2 is a side elevation thereof. Fig. 3 is a front elevation with the  
50 hopper broken away and the front plates removed. Fig. 4 is a vertical transverse section

through the mill. Fig. 5 is a detail view of the grinding-surface. Fig. 6 is a detail longitudinal section thereof. Fig. 7 is a detail transverse section of the same. Fig. 8 is a  
55 detail perspective view of the surface. Fig. 9 is a vertical section of one of the bearings of the roller-shaft.

Referring to the said figures by numerals of reference, 1 is a bracket-frame of suitable  
60 construction which is adapted to be secured to the wall of a building or any other suitable structure. Mounted upon this frame is a preferably metallic casing 2, secured thereto in any suitable manner and provided at its  
65 upper end with a hopper 3, having a removable vertical partition 4, located in the center thereof. The casing 2 is provided with a similar vertical partition 5, extending to the bottom thereof and forming two similar compartments 6 and 7, respectively, within each  
70 of which is secured a long depending plate 8, which is outwardly curved at its lower end to provide a concave 9 and provided upon its upper side with a grinding-surface 10, substantially of the form hereinafter more fully  
75 described. The depending plates are each provided with a rearwardly-extending pin 11, which passes through an opening formed in the supporting-block 14<sup>a</sup>, secured to the frame  
80 1, and is adapted to bear upon the inner surface of an inclined strip 12, hinged to said frame at one end and secured at its opposite end to a rod 13, extending along one side of the casing 2 and adapted to project through  
85 the end of a cross-strip 14, which extends across the face of the casing, as shown, and is secured to the front block 14<sup>a</sup>, mounted upon the frame 1. A suitable thumb-nut, as  
90 15, is mounted thereon, whereby the same may be adjusted backward or forward, as desired. The inclined strips 12 cross each other, as shown.

Journaled within suitable bearings 16, (one of which is shown in section in Fig. 9,) secured to the front block 14<sup>a</sup>, is a shaft 17, which  
95 extends through the sides of and the partition within the casing 2, and mounted upon this shaft within each compartment 6 and 7 is a roller 18, formed of suitable metal, as cast-iron, and upon which is mounted a cylindrical  
100 case or jacket 19, preferably formed of har-



dened steel and secured to said roller by means of a pin 20, which projects therethrough and into engagement with the shaft 17 of the device. These cases or jackets, as well as the concave of the plate 8, are each provided with a grinding-surface or dress of zigzag construction. These grinding-surfaces have incisions and ridges struck up on one side of the incisions and are arranged in parallel series and extend diagonally in opposite directions alternately, as shown in Figs. 5, 6, 7, and 8. The grinding-surfaces on both the rollers and concaves are formed by cutting incisions into the surface of the cylindrical cases and concaves, and thereby forcing the metal up above the surfaces at one side thereof. The incisions being formed in diagonal parallel series and each series inclined alternately in opposite directions, the ridges produced on one side of each incision prevent the grain when being ground from spreading toward the sides of the compartments. A pulley 21 is mounted upon the shaft 17 and is adapted to impart motion through a belt or other suitable device 22 to a second pulley 23, mounted upon a shaft 24, which projects into the bottom of a conveyer 25, of suitable construction, which is arranged at the rear of the frame 1 and extends to a point above the hopper 5 and is provided with a spout 26, whereby material discharged therefrom will be fed into one of the compartments 7 of the device. Motion may be imparted to the shaft through a pulley 27, mounted at one end thereof, and a suitable fly-wheel, as 28, may also be secured thereto, whereby the power may be controlled and the motion of the mill rendered steady.

The removable partition 4 of the hopper 3 is grooved upon opposite sides at its lower edge for the reception of the edges of sliding plates 29, the outer edges of which bear upon the inner surface of the casing 2 at the bottom of the hopper. These plates extend through the front of the casing and are provided with downwardly-turned edges 30, whereby the same may be readily grasped and moved back or forth to regulate the amount of material fed to the grinding-surfaces.

The front of the casing is preferably provided with a plate 31, which is preferably hinged thereto in any suitable manner and locked in closed position by means of a spring-catch 32, as shown.

In operation grain is fed into the hopper of compartment 6, and the flow thereof into the compartment is regulated by the sliding plate 29, as is obvious. It will be understood that the grain will fall between a depending plate 8 and its concave 9 and the grinding-roll, which as it revolves in the direction of the arrow shown in Fig. 4 will grind the same by means of the grinding-surfaces thereon. By providing grinding-surfaces of the con-

struction heretofore described a shifting movement is imparted to the grain during the operation of the mill, which, as is obvious, gives a side as well as a rotary movement to the grain, and will thereby prevent clogging thereof. By this construction heating of the grain is also prevented, because of the rapidity with which it is discharged. The grain passing between the plate and roller is discharged into the bottom of the conveyer 25 through a spout 33 and is conducted thereby upward to a point above the hopper 3 and discharged into a second spout 26, which conveys the grain into the hopper of the adjoining compartment 7 of the device. The operation of grinding within this hopper is similar to that hereinbefore described, and the grain passes outward therefrom into any suitable receptacle which may be provided therefor.

By adjusting the strips 12 from or toward the frame 1 of the device the plates 8, together with the pins 11 thereof, are adjusted in relation to the rollers 18, and it is obvious that by this arrangement the grain may be ground to any suitable fineness.

The operation hereinbefore described should only be employed when it is desired to secure a very fine product. Where coarse grinding is to be done, the partitions 4 and 5 may be omitted from the device and the grain ground by one operation and without employing the conveyer 25.

By providing the hinged cover 31 the grinding-surfaces may be readily inspected. The key 20, as before described, detachably secures the case or jacket 19 and the roller 18 to the shaft of the device, and the same may therefore be readily removed when it is desired to sharpen the grinding-surfaces or for any other reason.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

A grinding-mill comprising a solid roller constructed with a grinding-surface having incisions and ridges struck up on one side of the incisions; the incisions and ridges being arranged in parallel zigzag lines transversely of the roller and a depending plate constructed with a curved lower end providing a concave formed with a grinding-surface having incisions and ridges struck up on one side of the incisions; the incisions and ridges being arranged in parallel zigzag lines transversely of the concave.

In testimony whereof we affix our signatures in presence of two witnesses.

JOSEPH BERCHA.  
WASHINGTON I. CHAPMAN.

Witnesses:  
L. C. CHAPMAN,  
EBER LEEK.