(No Model.)

J. B. FREM.

ACTUATING MECHANISM FOR COFFEE MILLS.

No. 564,606. Patented July 28, 1896.

Fig. 1.

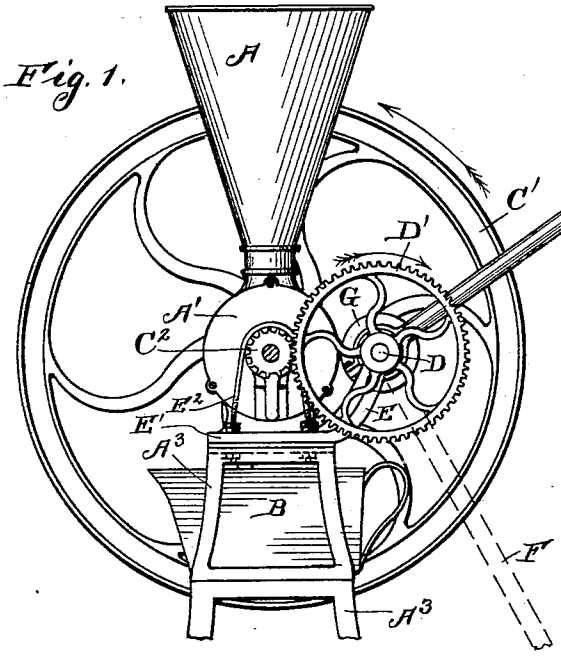


Fig. 3.

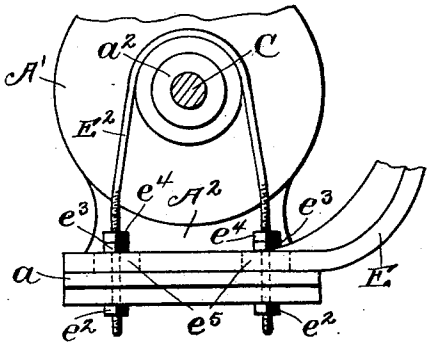


Fig. 2.

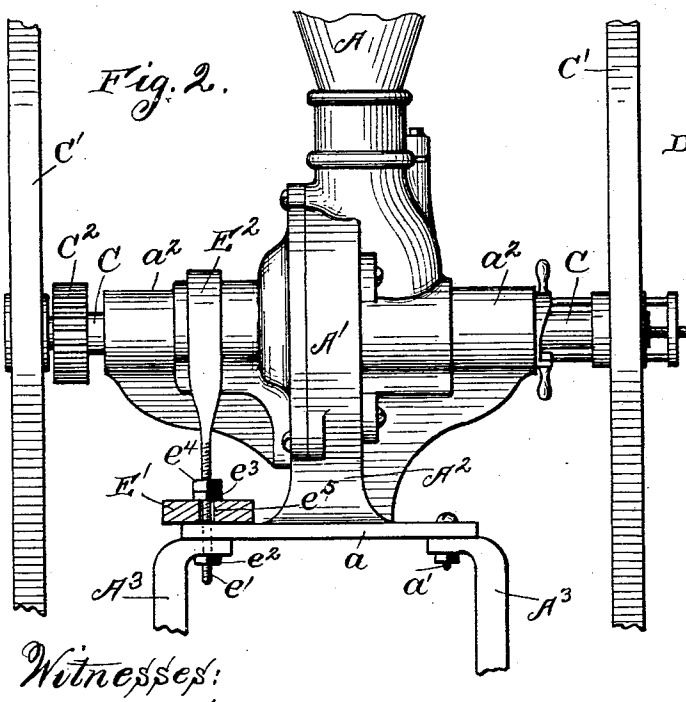


Fig. 4.

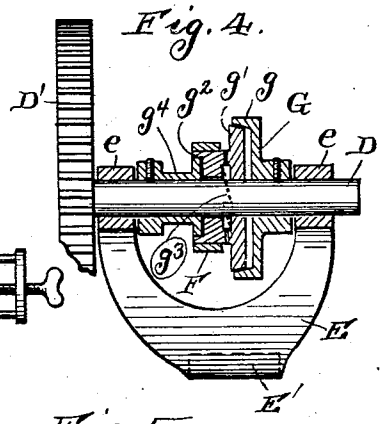
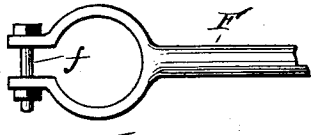


Fig. 5.



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JOHN B. FREM, OF CHICAGO, ILLINOIS.

ACTUATING MECHANISM FOR COFFEE-MILLS.

SPECIFICATION forming part of Letters Patent No. 564,606, dated July 28, 1896.

Application filed January 9, 1896. Serial No. 574,919. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. FREM, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Actuating Mechanisms for Coffee-Mills, of which the following is a specification.

This invention relates to improvements in devices for actuating or imparting the necessary rotative force to hand-power coffee-mills of that class usually employed by grocers and other retail tradesmen for grinding coffee or the like in small quantities of one or more pounds to suit the immediate requirements of individual customers.

The object of the invention is to provide coffee-mills of this character with an actuating mechanism sufficiently powerful and effective to enable the tradesman to impart in a few seconds such a high velocity to the mill that the momentum stored up in the balance-wheels, &c., will suffice to grind the quantity of coffee desired without further exertion or attention on his part.

The invention consists in the matters herein set forth and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a sectional side elevation of a mill provided with an actuating device constructed in accordance with my invention. Fig. 2 is a fragmentary front elevation thereof with parts in section. Fig. 3 is a detail side elevation showing the strap or brace applied to the main bearing. Fig. 4 is a sectional detail of the counter-shaft and clutch. Fig. 5 is a detail of the inner end of the actuating-lever.

In said drawings, A designates the hopper of the mill, and A′ the grinding-chamber beneath said hopper. Said grinding-chamber is merged at its lower end into a narrow neck A^2, through which the ground material is discharged into a removable receptacle or drawer B. The latter is located within a rectangular framework or compartment formed in the upper portion of the supporting frame or standard A^3, upon which the mill is mounted, and the top wall of said compartment is formed by a horizontal plate *a*, provided at the lower end of the neck A^2, and serving to directly sustain the latter, said plate *a* being secured to the framework A^3 by bolts *a*′.

C designates the main shaft, which is mounted in bearings a^2, that project on both sides of the grinding-chamber A′. Said shaft passes transversely through the grinding-chamber and supports the burs or grinders therein, and the shaft is furthermore provided at its outer ends with balance or fly wheels C′.

The features of construction thus far described are such as ordinarily characterize coffee-mills of the type under consideration and in themselves constitute no portion of my present improvement.

D designates a short counter-shaft mounted in suitable bearings *e* in a bracket E, which is adapted to be bolted to the framework of the mill. The outer end of the shaft D extends to within a short distance of the adjacent fly-wheel C′ and is provided with a rigidly-attached gear D′. The latter is arranged to intermesh with a pinion C^2, which is secured on the main shaft C on the inner side of said fly-wheel C′ and between the same and the adjacent bearing a^2.

F is an actuating-lever mounted to oscillate about the counter-shaft D and connected therewith by a ratchet or friction-clutch connection, by reason of which the shaft is free to revolve independently of the lever when the latter is oscillated in one direction, but will be held to turn with the lever when the same is oscillated in the opposite direction. As herein shown, this action is accomplished by a friction-clutch G, which may conveniently consist of an outer cone *g*, fixed to the shaft, an inner cone *g*′, loose thereon, and a loose sleeve g^2, having laterally-inclined or cam surfaces g^3, which engage similar surfaces on the inner cone *g*′. The lever F in this case is bifurcated to embrace the loose sleeve g^2 and is clamped in place thereon by a bolt *f*. Said sleeve g^2 is furthermore prevented from moving endwise on the shaft away from the cone *g*′ by a tight collar g^4. The inclination of the cam-surfaces g^3 of the cone and sleeve is such that when the lever is swung downwardly said surfaces wedge against each other, so as to force the two cones *g* and *g*′ together and temporarily lock the lever to the shaft. The rotative force applied to the lever is thus transmitted to the counter-shaft D and thence through the gear

D′ and pinion C^2 to the main shaft C of the mill. When, however, the lever is held stationary or is swung upwardly on the shaft, the wedging action of the cam-surfaces g^3 is relieved and the cones g and g' are released from each other, thereby unlocking the lever from the shaft and permitting the latter to continue its rotation while the lever remains at rest or is lifted for a succeeding stroke. The gear D′ is made much larger than the pinion C^2, and the speed of the main shaft C is consequently greatly multiplied thereby. By giving a succession of powerful strokes to the lever F a high velocity may therefore be readily imparted to the main shaft, and the resulting momentum stored up in the balance-wheels C′ will then suffice to complete the operation of grinding a considerable quantity of coffee previously placed in the mill without further attention or exertion on the part of the operator. The exact proportions of the gearing may be varied as deemed convenient or desirable, but in practice I have found that satisfactory results are obtained by making the gear D′ about four times the size of the pinion C^2.

The actuating mechanism thus described is desirably made in the form of a separate attachment capable of being easily applied to an ordinary coffee-mill without requiring the employment of skilled labor. To this end, the bracket E is shown as provided with a base-plate E′, which is adapted to rest upon one side of the horizontal plate a of the mill, when the latter is of the usual construction herein described. Said bracket is conveniently secured in place by means of bolts e', inserted in place of the bolts a', which are normally used to secure the frame together at this point. As a further improvement the bolts e' constitute the lower ends of a strap or brace E^2, which passes over the superjacent bearing a^2 of the main shaft C. Nuts e^2 on the ends of said strap below the plate a enable the strap to be drawn down firmly upon the bearing a^2, and similar nuts e^3 and check-nuts e^4, provided on the ends of said strap above the base-plate E′, then enable the latter to be clamped firmly down upon said plate a. A considerable adjustment of the strap E^2 is provided by having its screw-threaded ends e' of ample length to permit a considerable movement of the nuts e^2, e^3, and e^4, and the bracket E is made adjustable horizontally on the frame, to insure the exact intermeshing of the gears, by providing elongated slots e^5 in the base-plate E′ for the passage of the strap ends e'. The strap E^2 obviously affords a direct resistance to the lifting action on the adjacent end of the main shaft C, caused by the upper pressure of the gear D′ on the pinion C^2 when the lever F is forced downward. Such upward pressure is liable to be quite severe, since it is easy for the operator to throw almost his entire weight on the ends of the lever F, which latter is made of considerable length, and in the absence of the strap E^2, or an equivalent strengthening device, the mill is liable to be broken thereby at its weakest point, which in the ordinary construction would be in the neck A^2. The presence of the strap E^2, however, does away with all liability of rupture from this cause.

An actuating device of the construction thus described may obviously be applied to any ordinary mill by simply securing the pinion C^2 on the main shaft and then bolting the bracket E to the frame in the manner described, so as to bring the gear D′ into mesh with said pinion. Having thus provided his mill with this attachment, the tradesman will thereafter be enabled to place a quantity of coffee, as, for example, a pound, in the hopper, operate the lever F vigorously for a few moments to impart a high rotative velocity to the main shaft and fly-wheels, and then leave the machine to attend to his other duties, knowing that the momentum stored up in said rotative parts will be sufficient to complete the grinding action without further attention on his part. Aside from this advantage, moreover, my improved actuating mechanism will enable the operator to apply his efforts with much greater efficiency than is possible with the common device of a handle on one of the fly-wheels, and will serve to greatly lessen the fatigue of the ordinary grinding operation.

It will of course be understood that any other suitable device than the friction-clutch herein described may be substituted therefor with substantially the same result, and that such ratchet or clutch mechanism may be inserted at any other point in the gearing than between the lever and counter-shaft, if found desirable. All such and similar obvious modifications are evidently within the scope of my invention and will be understood as included within the spirit of the appended claims.

I claim as my invention—

1. An actuating mechanism for coffee-mills, comprising a horizontal counter-shaft supported on the mill-frame, gearing between said counter-shaft and the main shaft, a fly wheel or wheels on the main shaft, an actuating-lever mounted to oscillate up and down about said counter-shaft, and a ratchet or clutch device between said lever and counter-shaft, so arranged that a downward movement of the lever engages the clutch and effects a continuing rotary movement in the main shaft independently of said lever, substantially as described.

2. An actuating mechanism for coffee-mills comprising a bracket adjustably bolted to the frame of the mill, a counter-shaft journaled in said bracket, a gear on said shaft intermeshing with the pinion on the main shaft, an actuating-lever mounted to oscillate about said counter-shaft and a clutch inserted between said counter-shaft and lever.

3. The combination with a coffee-mill provided with a supporting-frame and grinding-

chamber extending upwardly from said frame and a main shaft journaled in bearings projecting laterally from said grinding-chamber, of a bracket secured upon said supporting-frame, a strap extending upwardly from said bracket around the superjacent bearing of the main shaft, a counter-shaft journaled in said bracket, gearing between the counter-shaft and main shaft and an oscillatory lever applied to the counter-shaft with an intervening ratchet or clutch device for imparting a continuous rotary movement to the main shaft, substantially as described.

4. The combination with a coffee-mill provided with a supporting-frame, a grinding-chamber extending upwardly from said frame and a main shaft journaled in bearings projecting laterally from the grinding-chamber, of a bracket resting upon said supporting-frame, a strap passing over the superjacent bearing and having screw-threaded lower ends extending through apertures in said bracket and supporting-frame, adjustable clamping-nuts on said strap ends, a counter-shaft journaled in said bracket, gearing between the counter-shaft and main shaft, and an oscillatory lever applied to said counter-shaft with an intervening ratchet or clutch device for imparting continuous rotary movement to the main shaft, substantially as described.

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