(No Model.)

G. M. CLARK.

CIDER MILL.

No. 263,686. Patented Sept. 5, 1882.

Fig. 1.

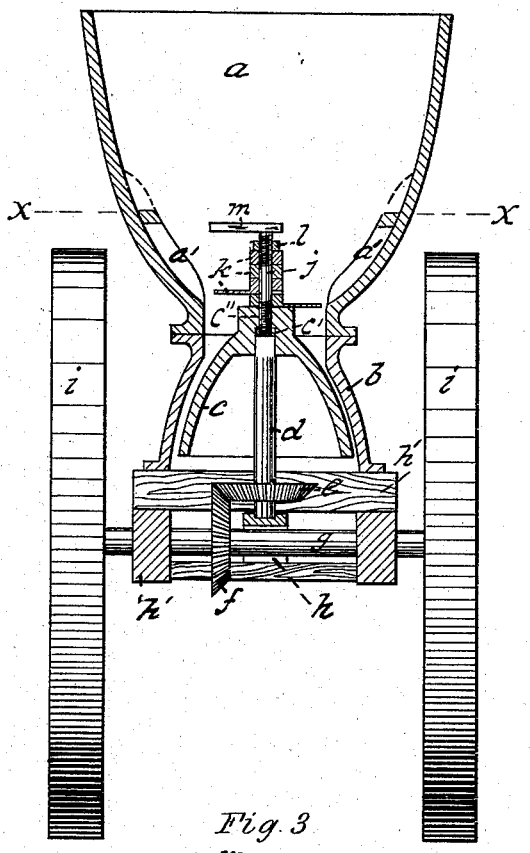


Fig. 2.

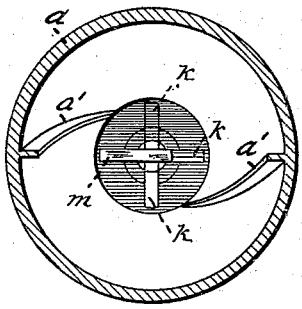


Fig. 3

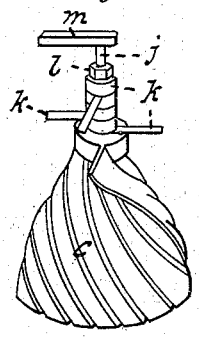
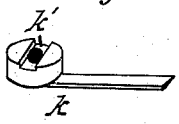


Fig 4.



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Atty

UNITED STATES PATENT OFFICE.

GEORGE M. CLARK, OF HIGGANUM, CONNECTICUT.

CIDER-MILL.

SPECIFICATION forming part of Letters Patent No. 263,686, dated September 5, 1882.

Application filed December 2, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. CLARK, of Higganum, in the county of Middlesex and State of Connecticut, have invented a certain new and useful Improvement in Cider-Mills, of which the following is a specification, reference being had to the accompanying drawings, where—

Figure 1 is an end view of a cider-mill embodying my invention, part of the machine being shown in section. Fig. 2 is a top view of hopper and grinder of same below line *x x*. Fig. 3 is a view of a portion of same. Fig. 4 is a detail view of a knife or cutter.

My invention relates particularly to that class of mills in which the fruit is ground between the corrugated surfaces of cylindrical or bell-shaped form of grinders placed one within the other in a substantially vertical position. The frame of the mill is made in the ordinary form and of suitable material—as oak or other hard wood—and the hopper, grinder, shafts, wheels, and other operating parts of such suitable material as cast or wrought iron.

In the accompanying drawings, the letter *a* denotes a hopper provided with one or more internally-projecting flanges *a'*. The outer and stationary grinder, *b*, is corrugated on its interior surface, and within it the grinder *c* (corrugated on its outer surface) is revolved by the vertical shaft *d*, which rests upon and is revolved in a socket in the bridge *h* by means of the beveled cog *e* (fast to shaft *d*) in mesh with the cog *f*, appurtenant to the shaft *g*, which is supported in bearings in the frame *h'* of the mill. Driving-wheels *i i* are the mediums through which motion is communicated to the shaft *g* and to grinder *c*. The shaft *d* is squared at its upper end, so as to fit into a mortise, *c'*, in the grinder *c* in such manner as to permit the longitudinal adjustment of the grinder *c* on shaft *d* by means of the bolt *j*, which is threaded to fit the threaded hole *c''* in continuation of the mortise *c'*. The bolt *j* passes centrally through the shanks of the knives *k*, through the nut *l*, and is provided at its upper end with a stirrer, *m*. The knives *k*, of suitable material, as iron, (cast or drop-forged,) are formed with the blade slightly projecting from one face of the disk-shaped shank, which has upon its opposite surface a mortise, *k'*, in section similar to the blade. The knives are firmly held upon bolt *j* by nut *l*, and are keyed together by the projecting blade of one fitting the mortise of the next knife—the one next to the grinder *c* fitting into a mortise in its upper surface—by this means preventing the rotation of the knives about the bolt *j*.

The operation of my improved device is as follows: The fruit to be reduced to pulp is placed in the hopper and the mill started by power applied to the driving-wheels. The lower layers of fruit are caught between the spiral flanges and the knives and cut into pieces in size depending on the number of the knives and the distances between them. The stirrer keeps the fruit agitated and causes it to feed down rapidly to the knives, whose blades have a slight pitch, (like a propeller-blade,) which, with the spiral form of the flanges in the hopper, assists in the downward feed of the fruit to the grinders, by which it is reduced to pulp of a degree of fineness depending on the distance between the faces of the outer and inner grinders. This distance is regulated by means of the bolt *j*, as follows: The lower end of bolt *j* is in contact with the upper end of shaft *d*, and by loosening the nut *l* and turning the bolt in the threaded hole in the grinder *c* it is raised or lowered upon the shaft *d*, and the distance between the grinders adjusted to any desired degree. The nut is then turned down upon the knives and the machine ready for use again.

My improvement consists of the flanges (preferably spiral) in the hopper, which assist in the feeding and serve as stationary blades in the cutting of the fruit.

It further consists in the stirrer appurtenant to the movable grinder, by which the feeding is assisted.

It also consists of the knives arranged upon the central movable shaft in such manner as to prepare the fruit by cutting for the action of the grinders, expediting the work to an extent of about five hundred and ten per cent. over the old form of mills.

It also consists in the adjustable grinder, by which the degree of fineness of the pulp may be readily regulated.

It is obvious that these features are applicable to mills for grinding vegetables, bark, &c., as well as to cider-mills.

Upright mills with grinders of the general

form herein described are not new and are not claimed by me.

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

1. In a grinding-mill, an interiorly-flanged hopper, in combination with an automatic stirrer, upright grinders, and actuating mechanism, all substantially as described, and for the purpose set forth.

2. In a grinding-mill, an interiorly-flanged hopper, in combination with rotary knives, upright grinders, and actuating mechanism, all substantially as described, and for the purpose set forth.

3. In a grinding-mill, an interiorly-flanged hopper, in combination with rotary knives or cutters and actuating mechanism, all substantially as described.

4. In a grinding-mill, in combination, a hopper, *a*, with internal flanges, *a' a'*, grinder *b*, longitudinally-adjustable grinder *c*, shaft *d*, adjusting-rod *j*, knives *k k*, with perforated and mortised shank *k'*, bridge *h*, frame *h'*, shaft *g*, and driving-wheels *i i*, all substantially as described.

GEORGE M. CLARK.

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